Sustaining digital products in the museum sector

Balancing value and resources through good decisions.

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ABSTRACT

Digital products are an increasingly significant part of the output of museums in the UK, but the rationale behind them and the long term plans for them are not always clear. This thesis argues that to consider such a digital product to be sustainable, the value it creates must justify the resources it requires. The decisions involved in building and supporting these products affect both the value proposition and the resource requirements, but also reflect the way that museums and their stakeholders see the balance between the two. At the same time, this balance is under the influence of a constantly changing environment. The study proposes a model of sustainability as a cycle of value, resources and decision-making, and three case studies are used to examine how decisions are reached in the face of flux and uncertainty. Some ways in which decisions can be biased or distorted are identified, and finally some approaches are offered for museums seeking to improve the balance of value and resources, and increase the quality of the decisions that underlie them.

ACKNOWLEDGEMENTS

*Dedicated with love to my parents, Kate and Tim Ottevanger,
inspirations in so many ways.*

LIST OF FIGURES

1 THE DILEMMA OF SUSTAINABILITY

RESEARCH CONTEXT

Our discussion begins in the year 2000. In the UK, as elsewhere, a millennial excitement seemed to pervade every public activity, an excitement that brought both historical reflection and future prospects into unusually sharp focus in the collective mind. Not coincidentally, substantial finance from central government and the National Lottery was used to fund many heritage projects – new galleries, museum extensions, public art, and various 'experiences' that were tied into the celebrations . But the investment was not only in bricks and mortar or artworks. During the 1990s, digital technology had progressively played an ever-larger part in everyday life, and it combined with this fin de siècle reflection and generous funding to give a significant boost to digital heritage projects.[1]

At London's Science Museum, a new exhibition, *Making the Modern World*, was to open that year, and work began on a web-based complement for it. The museum assembled a small consortium and raised funds to create an ambitious online space, aiming to enable online what the gallery did offline, but without simply attempting to replicate the experience – an impossible and inappropriate use of the technology. Instead, *Making the Modern World – Online* (MMW-O – see Figure

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[1] Funds from the National Lottery, launched in November 1994, were disbursed for 'millennium' projects from the beginning. Between 1995 and 2000 around £600m was channelled through the Millennium Commission, the Arts Councils, and the Heritage Lottery Fund to projects involving museums and galleries, many of which aimed to deliver in 2000. The HLF funded many significant investments in museums, but still the largest Lottery grant ever made to a museum was from the Millennium Commission: £51m for the creation of Tate Modern, securing 10th place on the all-time lottery grant list. Digital projects benefitted from both the HLF and the New Opportunities Fund (NOF), as they have more recently through NESTA, which was endowed with Lottery money. "Lottery Grants Search" online database, accessed on 5/2/12. Marshall and Berman, 2009; New Statesman, 2004.

1) would combine objects with storytelling and online learning resources with a remarkable degree of sophistication and depth – a reflection of the diversity of talent that it brought together. [2] MMW-O finally launched officially in mid-2004 with the stated intention of lasting for 10 years – could it have promised anything less after an investment of £1.5m?
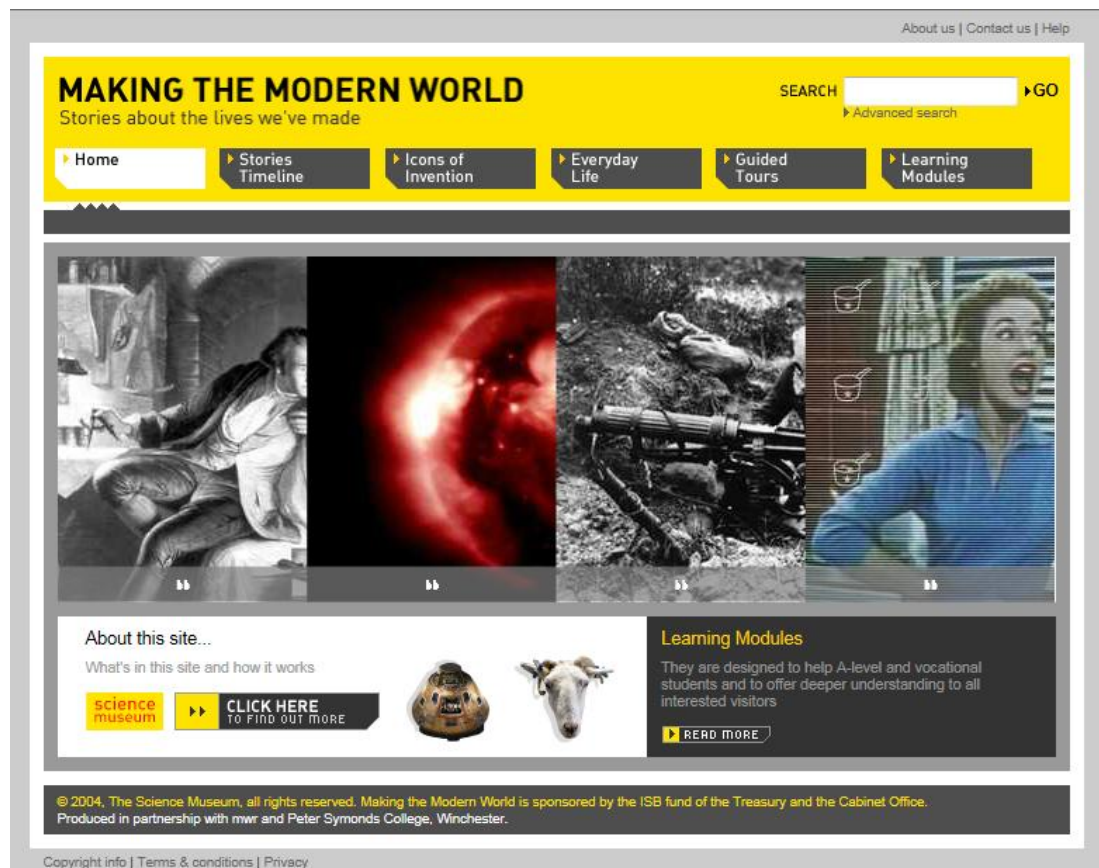
Figure 1: the Making the Modern World website (screenshot as of September 2012).

Over a decade on from that millennial excitement, approaching the end of MMW-O's expected lifespan, and having experienced an economic crisis, a change of government, and countless small revolutions in digital culture and technology, how has this trail-blazing digital resource fared? How can we even tell? In 2012

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[2] http://www.makingthemodernworld.org.uk/ Although the website itself just uses the name "Making the Modern World", we add the suffix "- Online" the better to distinguish it from the physical gallery to which it corresponds.

it is still online, but is it merely a survivor or a success – are these in fact different? What challenges has it faced, and how does the future look for it now? In other words, how sustainable is it?

<div align="center">*</div>

Sustainability is one challenge that never goes away. Everyone acknowledges its significance, yet in the area of digital heritage at least it is poorly characterised – what does it really mean to strive for the sustainability of a digital resource, beyond an ability to "keep it running"? If museums are able to keep a website, a game, a kiosk, a service running no matter what the cost, should they? Does merely having the means to do so make it "sustainable", or are products sometimes kept on life-support when they no longer merit the cost?

This thesis seeks to develop a more holistic view of the idea, to find a language that allows us to talk practically about digital investments in cultural heritage in terms of what really matters: how they serve organisations' missions and justify their existence throughout their life. Sustainability, at least in the context of digital heritage, is usually a question of deciding how to allocate limited resources, rather than whether those resources exist at all. Consequently, the argument is made here that sustainability should be seen as a question of *justifiability*: quite simply, in order to consider a digital product to be sustainable, the value it creates must justify the resources it requires. The thesis proposes a model of sustainability as a cycle of value, resources and decision-making. Sometimes critical resources may be in the gift of a third party, and sustaining more substantial investments may consequently depend upon making an argument to an external funder for *them* to provide what is needed. Value, too,

may be perceived by a museum (or its funders) outside its own walls, and understanding how to translate such external value onto its own co-ordinate system is a crucial first step. Even the processes of reaching decisions can involve a complex set of stakeholders. These three core ideas and a model built upon them provide the backbone for the case studies presented here, through which we examine how decisions are reached in the real world, in the face of flux and uncertainty. In the background are three other sets of factors that can have a significant and pervasive influence, and in a later chapter we use them to further enrich the picture. These other factors relate to *actors*, the *context* within which products sit (and which regulates decisions around them), and what we term *frictions*, which work to interfere either with decision-making or with the optimal flow of resources. Thus they can act to unbalance the relationship between value and resources, potentially causing the product to fail when it should survive, to persist when it should be shut down, or to be run in a way that does not make the most of its potential.

The roots of sustainability, of course, reach back well before a product launches, into its pre- and proto-history, and so the research behind this thesis also aims to identify some of the factors in these stages that can significantly bear upon the future fitness of a digital resource.

RESEARCH QUESTIONS

Principally, this thesis asks *what affects the sustainability of the public-serving digital products in museums?* A number of secondary questions follow from this and from our initial contention that justification should lie at the heart of sustaining a resource. We will be asking *whether value affects sustainability* and

what kinds of resources are needed to sustain value creation? Perhaps our most significant question is, *how are decisions made that determine the future of a product* – decisions both about how the product is built and about when its value justifies the resources required to keep it going. And as well as this concern with how decisions *are* made regarding sustainability (a positive question), we will attempt a more normative approach of describing how clear-sighted resourcing decisions *should* be reached. The gaps we find between what is and what should be will help us towards an understanding of *what might interfere with the decision-making process*, and ultimately with what we might call true sustainability: a product that continues to exist for as long as it deserves to exist. Finally we will use what we have learned to look at the domestic environment in which museums in the UK are currently situated, and ask how well it is adapted to enabling digital heritage investments to continue to generate value in the longer term.

It is worth making explicit at this point that the purpose of this investigation is not to propose models for the financial or technical support of a product. Invaluable work has been produced by Ithaka S+R and the Strategic Content Alliance (Guthrie, Griffiths & Maron, 2008; Maron, Smith & Loy, 2009; Maron & Loy, 2011) which examines the business models used in a variety of digital content projects in the cultural heritage and higher education/research sectors. Their work considers the importance of the value proposition of a service, but the focus is upon the practical concern of securing resources to that it can "survive and thrive", which carries an implicit assumption that projects should be sustained. In contrast, this thesis examines such an assumption and seeks to

understand not just whether resources can be secured, but how those key decisions are made. There are clear overlaps between the work presented here and that published by Ithaka S+R, but with the latter characterising the variety of business models that can currently be seen, our aim is more to build a theory of sustainability that can be used to shed further light on such business models.

This investigation is concerned with the domain of cultural heritage, but particularly with museums – a category of collecting institution with holdings that are frequently unique and which typically exhibits rather than lends its collections to the public. It is not only the services built and run by single institutions that are of interest, however, but also those developed as partnerships or co-operatives. Geographically, the perspective presented in this thesis is UK-orientated, inasmuch as our examples mostly come from UK-based institutions or organisations that have connections to the UK museum sector; and in addition we have a secondary concern with whether there are any specific features of the UK context and culture that affect the sustainability of the digital investments made by institutions there. Nevertheless we will not limit ourselves only to UK museums: these institutions operate within an international context and this is felt particularly keenly in digital media, both because the internet enables ready access to a global audience, and because the developments in technology, law, partnerships, and professional networks that form the context for digital heritage often operate or have implications beyond national boundaries. The "public-serving" aspect of our investigation usefully limits it to those products that are aimed chiefly at addressing the needs of external audiences, so we would not include, for instance, systems like collections

management systems or e-mail software that are primarily intended for a museum's internal use, but we would include interfaces designed for online or onsite visitors and the infrastructure intended to support these – things that have at their heart the direct delivery of a mission-mandated objective to serve the wider society. We are interested in sustainability rather than preservation, and in what we will term "digital products", both of which are explained below.

The various constraints outlined above, then, are not hard-and-fast rules but guidelines that give a necessary focus to the research. Aspects of our study have wider implications, and one of our major case studies is of a European partnership, enabling us to start to look both at the intricacies of sustainability when many institutions are involved, and at how those institutions relate and react to the global context in which they sit.

The scope of this project depends upon some terms that require closer definition.

Digital product

It is difficult to create readily-understood categories of the phenomena we encounter in digital form every day. There are many reasons: digital media's intangibility; its ability to present different aspects to different people; the fact that frequently what appears to be small, simple and self-contained turns out to be complex and intimately linked to other systems; the natural tendency for people to reach for metaphors from the physical world to label (and construct) the virtual, which can be helpful or confusing and limiting.[3] Others have

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[3] The term *skeuomorphic* is often used to refer to digital design that is intended to mimic the physical world in order to make it familiar. This can end up limiting expectations and capabilities

attempted to do this with, for example, learning resources (see for instance Harley,2007; Harley, Henke, Lawrence, Miller, Perciali, & Nasatir, 2006; Polsani, 2003), but it remains an incomplete task. For our purposes here, though, it is necessary only to draw a line around the general category of things that are of interest and choose a label for convenience.

Our concern here is with higher-level digital creations, that are complex and operate at the level of an experience or a service – the sorts of product that in themselves constitute both a value proposition and a genuine sustainability challenge. This might mean anything from a game, a standalone gallery kiosk or a mobile app, to an online exhibition or a network of websites run by multiple partners.

The reason for this is two-fold. Firstly, this is the level at which users and organisations tend to think, and at which decisions tend to be made. They might ask, "shall we invest in this website?", or "should we scrap that game now that it no longer works on popular browsers?", or perhaps "should we be part of this new partnership web initiative?" It makes sense, then, to concentrate our thinking at the same scale as that at which evaluations and decisions tend to be made. Secondly, more complex entities pose a different set of questions about their long-term existence, and ones that are more museological in nature, being less technical and more related to the purpose of the organisation. Simple file-

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– think for instance of the virtual calculator on a PC, which is for some reason restricts you to seeing a single line of your calculation and prevents you editing it. Why? The language of the real world migrates too, with the internet itself variously thought of as a library, a shopping centre, a web, an "information superhighway", and with web-rings, sites, home pages, and portals all at times being favoured terms that, in essence, attempt to organise the organic chaos that is the nature of "hypertext" (another old term, but one that still has resonance). In an early study, Ratzan (2000) made just this point about the traps that metaphors set whilst also helping to provide structure to users in the unfamiliar environment of the Web.

based assets offer little in the way of museum-specific challenges, and ensuring their long-term existence is typically seen in terms of preservation, distinct from our concern with sustainability (see below) – they are unlikely to require more than server space and perhaps periodic migrations and format-shifting (that said, ensuring that they realise value is another matter[4]). Looking at more complex products, however, we see that they may depend on things outside their own system – for instance, a steady flow of content, a community, network effects – which makes the problem of on-going maintenance less about the continued existence of bytes in isolation, and more about the ability of the whole system to support the organisation's mission.

With this in mind, we need a suitable phrase. Some commonly used terms are rejected because they carry awkward connotations – for instance, "digital object" can be used to mean *digitised* objects, that is, virtual versions of physical collections, and also imply something self-contained. "Digital asset" is frequently used to signify a file-based entity or a small collection of files, which are frequently part of a larger-scale digital experience but don't typically constitute a complete experience in their own right.[5] "Digital resource" is an appropriate description of our subject,[6] but is too close to the nomenclature used elsewhere for the factors necessary to support the subjects of this study. Consequently, the

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[4] There is of course also a challenge in sustaining the process of preservation, and it is also only fair to point out that the digital preservation community has developed a sophisticated conception of the notion of preservation that has informed the current work and highlights the importance of knowing what are the "significant properties" of a given resource rather than aiming to preserve it purely as it was. The work of the InSPECT project (http://www.significantproperties.org.uk/) formalised this approach. In this way, the digital preservation of file-based assets much in common with digital sustainability as envisaged here for service-level products.

[5] For a typical example of usage see FERL (n. d.).

[6] Harley *et al* (2006), for instance, used the term "digital resource" in this sense of experience-level entity (their context was e-learning).

phrase *digital products* will be used in this study to refer to the entities under discussion. They may sometimes have more of the character of services than "products", but the reverse would be as true were we to use "digital services".

Finally we should note that a digital product may in fact be infrastructural and have more than one "experience" or service built upon it. This is increasingly the case with major investments in museums: they form part of complex systems and are often expected to be able to support new interfaces or content as required. We limit ourselves, though, to those pieces of infrastructure for which the primary purpose is to support public interfaces.

'Public-facing'

Our focus is on digital products built to directly deliver the mission of a museum by serving the needs of end-users. The public-facing aspects of the definition cited above are chiefly the communication and exhibition of heritage, supported by the activities of conservation and research. The audience addressed may be broad or very specific – primary school pupils or hobbyists, for instance. Services for professional audiences may also come under this umbrella, where they are not solely to generate revenue but also to deliver on the mission, for instance by stimulating the creative reuse of its assets or the dissemination of the museum's core concerns. In fact digital technology offers considerable potential to enable third parties to do this, boosting the creative economy along the way, a possibility which we will return to during our case studies. This means that some e-commerce websites are about delivering mission-based objectives as well as about raising revenue, and become interesting subject matter for this investigation. Where revenue is the only purpose, however, the issue of

sustainability becomes more a question of straightforward economics and of rather less interest when we wish to understand its relationship to value, resources and decision-making.

'Sustainability'

This research is not concerned with preservation; that is, with ensuring that a product is maintained in a given state (or that salient aspects of its state are maintained thus). This is the work of many digital archives, which engage in preservation with a dash of sustaining, and it is an idea better suited to the file-based digital assets discussed above than to the digital products we concern ourselves with here. Our interest is rather in *sustainability*, a term we use to indicate, not the continuation of a state, but the continuation of an activity, a process or the ability of a product to serve its purpose – in other words the persistence of its *usefulness*. We will fully develop this idea of sustaining and sustainability in Chapter 3.

RESEARCH METHODOLOGY

The heart of the fieldwork conducted for this research consists of in-depth case studies of two projects in which the author was embedded - one at the Museum of London between 2008 and 2010, the other the Europeana Project run by the European Commission from 2007 onwards. These were selected to gain an understanding of how value and resourcing come to be understood and filtered through into decisions on building and running digital products. Each study involved a series of extended semi-structured interviews with key project personnel, observations from project meetings (at which full informed consent was supplied by the organisation), unpublished archival material (including

material such as minutes, specifications and funding bids), as well as a substantial amount of published material (including white papers, strategies and business plans, conference presentations and press releases). As well as these contemporary case studies, special consideration was given to Making the Modern World – Online. MMW-O offers us a long-term historical perspective that serves to illustrate the problem and frame some questions that inform the more recent case studies, where we investigate decision-making processes, value and resources from a different, contemporary view-point.

The core case studies were chosen to draw out some different dimensions along which projects vary. Both are large (one very large), which doubtless gave them some different characteristics to small projects, but the fact of this scale – and the investment from their various stakeholders that it implied – ensured both that sustainability was an explicit concern, and that the decision-making processes were involved.

The research complied at all points with the University of Leicester's Research Ethics Code of Practice,[7] with each case study undertaken with the informed consent of the senior management at the respective organisations. In the case of the Museum of London, the museum was a partner in this doctoral project and a signatory to a contract committing to support the author's research. In the case of Europeana, its executive director, Jill Cousins (interviewed for this study) agreed to the research taking place and provided invaluable support, including inviting the author to participate in various workgroups, meetings and conferences during the EDLnet and Europeana Version 1.0 and Version 2.0

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[7] See: http://www2.le.ac.uk/institution/committees/research-ethics/code-of-practice.

projects from 2007 to 2012. For Making the Modern World Online, meanwhile, a key source of information was Robert Bud, Principal Curator of Medicine and the project's owner at the NMSI, who also offered his support to the study.

The first case study concerned the new mechanism for delivering collections data to digital platforms at the Museum of London (MoL). MoL is a mid-sized museum: large by regional standards but smaller than most national museums. The project was aimed at supporting delivery to both galleries and to the web and was tightly bound to revisions in working practices, adding a degree of complexity and dependency. Its funding was tied to a major capital build project – the development of new gallery spaces – and its initial deliverables were focussed on the public interfaces needed for the galleries. However, a history of collections-based web projects meant that from the beginning there was an awareness of broader long-term requirements that ultimately led to a change of scope, with the product taking on a more infrastructural character. As Chapter 4 will explore in depth, the stakeholders in the product were constrained essentially to internal staff, the public audience, and, to a limited degree, the funders supporting the overall gallery project. Internal resources were limited, especially in terms of technical staff time, and went through a crisis during the project, but there were funds available to procure resources from outside. This reflects a common characteristic of museum digital initiatives, where for better or worse waves of project funding can overwhelm the core funding available for supporting an internal digital team.

Europeana, the case study to which we turn in Chapter 5, provides a clear contrast with MoL's digital product. Once again it concerned the use of digital

collections and the building of both infrastructure and public interfaces, but the similarities stop there. An initiative springing from the European Commission, we shall see how Europeana is a partnership comprising a very varied set of stakeholders and with an open-ended vision, quite unlike the bounded, single-organisation project at MoL. It is complex even by the standards of partnerships, with international stakeholders that included libraries, archives and audio-visual archives as well as museums, whose motivations and priorities were consequently varied and sometimes conflicting. Europeana is in some obvious ways extraordinary amongst digital heritage investments, but its scale and duration also mean that it throws up many issues that might occur elsewhere. It is subject to very different environmental constraints to MoL, and internally its political nature introduces a new strand to our study. Intriguingly, Europeana is at the same time becoming a part of the landscape that its content-providing partners face, a centre of gravity that increasingly influences decisions taken outside itself. It thus offers lessons on how cultural heritage organisations may relate to other too-big-to-ignore features of the digital landscape too.

Although both case studies share the objective of bringing digitised collections online, we can see that they are widely divergent in other characteristics; combined with Making The Modern World Online they provide variation in scale and scope, including both partnerships and individual efforts, regional and national museums, and offering both British and international perspectives. Whilst MMW-O was initiated in 2000, one case study graduated from beta status in 2011 and the other has secured financial support until 2015 and possibly to 2020. These multiple perspectives throw light on a variety of decision-making

processes, sources of value, and challenges to sustainability over a period of more than a decade.

Each case study was built on a combination of interviews, emails, direct observation by the author, and archives of published and unpublished material. Interviews were planned and undertaken following the guidance and good practices laid out in Gillham (2005). They were conducted verbally, either face-to-face (three interviews), via Skype (four interviews) or over the telephone. All were recorded with the exception of the interview partially conducted by telephone, for which extensive notes were made. Each interviewee was informed in advance of the general scope of the interview and the purpose of the research, and of the use that their contributions might be put to. They granted explicit permission for their words to be recorded and used in this thesis and to be attributed to them, in accordance with the ethical guidelines of the University of Leicester. Each recording was then transcribed. Quotes were occasionally edited to the minimum degree necessary for clarity but without altering their meaning. Four other individuals provided additional information via email, having provided informed written agreement for its use in the research.

Institutional archives were consulted for each case study. In the case of MoL, none of the material referenced in this thesis has been published before, and it includes extensive formal documentation of the project before its initiation right through until completion, as well informal documents such as notes from meetings and discussion documents. The archive consulted for Europeana includes material in official publications and press releases from the project and from the European Commission, but also (and perhaps more significantly) many

items of grey literature such as reports, discussion documents, surveys, presentations to conferences and meetings, minutes, product specifications and use cases, accounts and financial plans, funding proposals and business plans in draft as well as final forms.

STRUCTURE OF THESIS

Chapter 2 takes a deeper look at Making the Modern World Online, the product of a collaborative project which ran from 2001–2004 . MMW-O helps in posing a set of questions that form the focus of investigation throughout the rest of the thesis. This is followed by a wider survey of the historical context of digital sustainability in the UK heritage sector in the 2000s, which reviews the major strategic players and the political and technological environment. Some of the trends seen in the digital activity of museums over that period are highlighted and a few examples identified that show how outcomes vary.

Chapter 3 develops a theoretical perspective on sustainability to frame the core case studies. It starts by exploring previous research and theoretical perspectives on digital "sustainability" itself, and situates the concepts of value, resourcing, and decision-making at the heart of the question. Our discussion continues with an extensive look at the literature around these ideas to start to define them and to see what questions they themselves pose. There can be a difficult transition between preparing for sustainability whilst building products, and actually ensuring their continued existence after build has moved into business-as-usual, so some time is then spent considering the important differences between these phases. Using this toolkit of ideas, the chapter concludes with the formulation of an elementary normative model of how

sustainability "should" work, described either as an evaluation akin to a pair of scales or, more dynamically, as a cycle of value creation and resource procurement that passes constantly through a set of decisions.

Chapter 4 concerns the Museum of London's Collections Online project, which was contained within a single, mid-sized institution and had a relatively straightforward set of stakeholders. Thus prepared for something bigger and more complex, Chapter 5 then turns to Europeana, an international partnership of dramatically wider scale and scope than MoL's project. Critical resources are held by numerous stakeholders with differing needs, and Europeana itself significantly shapes the environment in which other digital products now find themselves, with consequences for their own sustainability.

With the main case studies concluded it is possible to take a step back to consider what they mean for the model presented in Chapter 3. Chapter 6 therefore identifies some themes from the case studies and observes that, in-between our model and these empirical observations, there exist some lacunae that call for explanation. The reality of digital heritage management is that any equilibrium that resources and value may reach can be upset by outside factors, and that decision-making is often influenced or complicated by considerations that our elementary model does not account for. A number of such influences are identified and grouped into three sets, identified as *actors*, *context*, and *frictions*. The discussion examines subjects including the psychology of decision making, the economics of social enterprise, organisational science, problems of measurement and risk, hidden costs, and the relationship of digital heritage projects with the wider environment. An idea extracted from legal theory, first

introduced in Chapter 3, is offered as a framework for examining the context that frames decisions. To reflect this richer understanding of sustainability a refined version of the cycle model is offered which is more holistic and process-based. The chapter concludes by revisiting Making the Modern World – Online, one tumultuous decade on from project's initiation, and reflects on its current status using the vocabulary and perspectives developed over the previous six chapters.

Chapter 7, our last, surveys the entire thesis and then identifies its most important findings and recurrent motifs, offering some suggestions of ways in which museums can work to improve the ability of their digital products to endure. One such motif is the impact of information, uncertainty and attitudes to risk upon sustainability-related decisions. Another is the problematic nature of the project-based funding that is often used to build products that then need on-going investment to realise their value. A third theme is that of the complexity of stakeholders for museums and the implications this has for where value is perceived to reside and how resourcing is sought. Also highlighted is the critical need for museums to establish clear and empowered leadership for their digital activities, able to develop and deliver upon a vision that is consistent with the whole organisation's ambitions and can informed balanced decision-making. It is also suggested that museums should seek to retain knowledge about their own digital products and services by nurturing an in-house digital labour force. Some limitations of the research are then discussed, followed by an evaluation of the contribution that this research makes. The "cycle model" is a part of this, complementing previous work with its emphasis on decisions and the ways in which outside influences can disturb the relationship between value and

resourcing. It is accompanied by the idea of frictions, which helps us to think about ways in which decisions could be improved. The emphasis placed in this research upon the cost of uncertainty and the many places in which it can arise within the cycle of value and resources is also noteworthy. It indicates some ways in which museums can actively seek to strengthen the sustainability of their digital products.

We return first, then, to Making the Modern World – Online, which will help to illustrate and tease apart the problems the thesis seeks to investigate.

2   DIGITAL SUSTAINABILITY IN THE UK CONTEXT

This chapter sets out to frame the problem of digital sustainability in museums by looking first at Making the Modern World – Online, an example of a major project undertaken in the early 2000s, which draws out some of the aspects that will be subjected to a deep investigation in the later case studies. Such products exist within an environment that helps to shape them and subsequently influences how successful they are and how well they manage to secure the resources upon which they depend, and the discussion then moves on to consider how this environment has developed over the last decade and the state it is in now. This exercise is partly to help in understanding the specific challenges that digital products face in the present day, but also to highlight the critical importance of change and unpredictability for our central concepts of value, resources and decisions, which will be considered in the following chapter.

HOW 'MAKING THE MODERN WORLD – ONLINE' POSES A MODERN QUESTION

> *What you might be interested in is the sustainability of an idea.*
>
> Robert Bud, Principal Curator of Medicine and Project Director of MMW-O (2012).[8]

Making the Modern World – Online[9] may have launched in 2004, but its prehistory extends at least a decade further, according to the account of Frank Colson and Jean Colson, two key participants in the project (Colson & Colson,

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[8] Quotes in this chapter attributed to Bud or to Andrew Nahum are extracted from a combined in-person interview conducted on 27 February 2012. This interview provided support for many of the statements here.

[9] See: http://www.makingthemodernworld.org.uk/.

2010). They (and through them their company, MWR[10]) had ties to the NMSI/

Science Museum[11] starting from the early 1990s, a period in which several

publications around the subject area of technology's relationship to modernity

were written by curatorial staff at the museum (Bud, 2000; Cossons, Nahum &

Turvey, 1997). These included Andrew Nahum and Robert Bud, later to be Head

of Content and Project Director (respectively) for *Making the Modern World -

Online*. Bud became interested at that time in the possibilities offered by

multimedia to address a genuine problem of the Science Museum at the time,

namely the competition for physical space:

> [Then-director Neil Cossons] had a problem: how do you deal with
>
> modern science in the Science Museum given that the museum is full?
>
> So he thought, if we build an extension then we can put the new stuff
>
> in it and we don't have to have this battle between the new and the
>
> old in the existing building. (Bud, 2012)

The Wellcome Wing that resulted from this was planned and built between 1996

and 2000, including the *MMW* gallery with which Nahum and Bud were centrally

involved. As work on this physical overhaul of the museum progressed,

discussions continued about how to extend the work into the "new media" space

that was then opening up online. As we shall see in the second half of this

chapter, change was happening extremely rapidly, both technological and socio-

cultural changes, as a population with widely varying familiarity with computing

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[10] Mackenzie Ward Research used the lower-case abbreviation "mwr" for their brand, but for the sake of readability and consistency with other abbreviations here, the upper-case form is used.

[11] The National Museum of Science and Industry (NMSI) was the official partner organisation. The Science Museum in London was the part of NMSI that was actively involved in MMW-O – and where, of course, the physical gallery is situated.

started to become accustomed to the idea of online communications and services as a part of daily life. The fact and the rapidity of this change affected not only the market to which *MMW-O* would be addressed but was to be an area for continuous negotiation within the partner organisations behind it, each of which was challenged – like the rest of society – to work out how new practices and possibilities would fit into their own activities.

An influential factor in the approach taken to MMW-O's creation was the partners' perception of an audience need for some familiar bedrock upon which it could depend: the trusted and authoritative status of NMSI, the quality of the research that had been invested in the product, and the overall production values were seen as very important whilst many users were navigating an unfamiliar online territory (Colson & Colson, 2010).

This reflected a core belief of the project: that the authority of the editorial voice was essential for success. In this twin track approach – seeking to understand emerging habits of consuming knowledge in the new territory of hyperspace, and offering a reassuringly familiar guiding hand and authoritative voice – we can perhaps discern a reaction to the rapidity of change, an attempt to plant two feet firmly and offer reassurance to an audience still unsure how to relate to museums, to learning, and to material culture in a virtual context. Given the positive reception that MMW-O had upon its launch,[12] the approach was evidently still supportable by 2004 despite the on-going rapid evolution of digital culture.

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[12] A string of awards and good notices are listed by Colson and Colson (2010) and in the annual reports of the Science Museum. These ranged from reviews in daily newspapers, to a BAFTA nomination, to the "Best of the Web" award at Museums and the Web 2005, the pre-eminent conference of its kind. (NMSI, 2005).

In planning MMW-O, recounts Bud (2012):

> We developed this theatrical model, the cinematic approach [...] The web
> had come along and we could do [different] things [...] this was only 2002,
> and most people were still on 56k [dial-up connections], but we said, well
> let's assume broadband will be here.

The question of whether to build for broadband was indeed a key one, fundamental to the character of the product, and there was resistance from some quarters of NMSI, where Nahum reports that "there were people championing the accessibility issue here, and [...] some of the internal web people said 'it's not fair, you can't do that'. I was always pushing to use the maximum bandwidth". For the future-proofing of the product this was significant, but evidently at the time it caused some difficulties and indisputably compromised the broadest immediate accessibility of the product.

As well as NMSI and MWR, the consortium behind MMW-O included Peter Symonds College (PSC), in Winchester, Hampshire. Together they secured funding totalling around £2,000,000 from the Invest to Save Budget (ISB), a fund run by the Treasury, in early 2001. The ISB objectives placed great emphasis upon the creation of partnerships to enable innovation in government, as we can see from a UK government white paper *Modernising Public Services for Britain – Investing in Reform* (probably from 1998), quoted in Segal Quince Wicksteed Ltd (2000):

> An Invest to Save Budget will be created to help develop projects
> which bring together two or more public service bodies to deliver

services in an innovative and more efficient fashion. It will encourage

such bodies to work more closely together and identify projects

which would not otherwise go ahead.

Reducing the risks of innovating and of partnership chimed well with MMW-O's ambitions and challenges. We can see MMW-O's own objectives in the project implementation plan of July 2002 (Bud, 2002a), as work got underway:

- To create a catalyst for the exchange of ideas between audiences and experts.
- To substantially widen the public accessibility of a key national cultural asset relating to invention, innovation and creativity.
- To build an expandable digital media programme-making resource.
- To assist in the motivation and learning of A-level and vocational students.
- To provide tertiary level teachers with a customisable set of support materials.
- To encourage a higher, broader engagement with science and technology.

This was an ambitious set of objectives planted squarely across the competencies of the three core partners (two public sector clients, one commercial supplier), and aimed directly at an area that was subject to much political interest at the time: tertiary and higher education. Unsurprisingly, the bid was also slanted to fit the "invest to save" dimension of the fund, and Bud describes how he used a calculation of the value of physical visits agreed with the government around the same time:

We had just switched from charging to non-charging, the government then compensated us for the revenue we'd lost [at £3.70 for each visitor]. On the basis of that I could have a very elaborate growth curve reaching a maximum [...] and it followed from the assumptions that with about 6m visitors overall you would break even. (Bud, 2012)

The build process was complex. Three main partners were involved variously in content planning and production, design, and technical implementation, supported by a number of subcontractors. Nevertheless the project was completed broadly to schedule and within budget and as far as can be told from the available archives it appears to have fulfilled the objectives of the consortium's members. Achieving the triumvirate of on budget, on time and (almost) to specification was not without its own cost, though. According to Nahum, "because no one really knew what a web publication really was I don't think anyone really knew what the budgets should look like at the beginning, and I think it got very strained as a result"; the PRINCE2 project management methodology mandated by the Treasury, in the view of Nahum and Bud, was also very burdensome. For all of this, MWR shouldered the responsibility:

The whole thing had been set up so that we would bear the minimum risk and [MWR] would bear the maximum risk, and from our point of view that worked out fine. (Bud, 2012)

MWR's project director for MMW-O from mid-way through the project was Martyn Farrows, who observes that the company did indeed shoulder much of the risk. In his view, weaknesses in budgetary controls early on led to under-

delivery, and as a consequence MWR were "playing catch-up by effectively subsidising the remainder of the project" (Farrows, 2012).

PSC's inclusion was important in defining the product, because it needed to address their needs as well as those of NMSI. Nahum and Bud suggest there were several incentives for PSC to participating in MMW-O:

> they got high prestige, they were partners in a successful product working with the Science Museum. Also they got a teaching product (Bud, 2012)

> and they had a reputation as a leading A Level college and saw this a part of their mission. (Nahum, 2012)

As the scale of the commitment required from them became clearer this was ever more important. As Bud notes, "the teachers were having to do this in their spare time. So it was clearly a requirement on us to motivate them and to make them feel that they really had ownership of the product".

The finished product – which eight years after launch remained essentially as it was launched in 2004 – is a collection of 25 narratives comprising about 200 'scenes' populated with media using objects from the collections. Users can take a chronological or thematic approach to the narratives, and together with other materials the components are re-used in a suite of learning modules, several hundred articles, and guided tours. The whole assemblage offers multiple ways into the content (indeed Nahum suggests that "possibly, looking back now, there may be too many ways through it") and there is a generous quantity of interactive multimedia (using Flash).

2.1.1 PREPARING FOR SUSTAINABILITY

MMW-O was built with sustainability conspicuously on the agenda:

> Sustainability issues have been addressed from the inception of this
>
> project. A taskforce of NMSI-MWR has been examining the
>
> technical/resource issues involved in delivering MMW-Online as part
>
> of the NMSI's overall on-line offering. (Bud, 2002b)

A good place to start for understanding how the problem was understood within the project is the original set of objectives quoted above, and the risk analysis from the same document (Bud, 2002a, p. 4). Some of the risks identified there also amounted potential threats to on-going sustainability, as envisaged in 2002. They include, firstly, a lack of buy-in from the 16+ audience and from teachers; a failure to communicate the core values of the Science Museum; and finally the risk of premature obsolescence, that is, the inability to support the evolving media and delivery technologies used by its audience.

Each risk had its mitigation strategy, and each appears to have been avoided in the run-up to launch and initial period as a live service. But how might they be adapted to reflect the sustainability risks over for the longer term? *Lack of buy-in* might be broadened to include the risk of the product's relevance reducing as school curricula change, and of the online habits and norms of students developing in a way that would stop them paying attention to MMW-O. *A failure to communicate NMSI values* might actually, in the longer term, become a risk that NMSI's own values might change and leave MMW-O behind, no longer generating a return of the sort that the organisation still considers important. And beyond the relevance of the *media and delivery technology* that the service

employs, the product could face problems if there were an inability to technically support the product, whether for reasons of technology change, skills and capacity, or a lack of the raw finances that could address any of these.

From an examination of the original bid document submitted to ISB, it is evident that MMW-O was also intended to provide the foundation for a long-term programme of digital media production: "For the partners and stakeholders it will form the basis of a powerful, expandable digital media programme-making resource from which a myriad of ancillary products can be derived" (NMSI, 2000). The final progress report also indicates that the product's owners thought this had been achieved, and that they then had the basis of a "future-proofed" asset that was flexible and adapted to modification, growth and re-use (Bud, 2004).

2.1.2   MMW-O IN 2012

Making the Modern World – Online remains online in 2012, eight years after its launch, and in itself this is a testament to its durability, for many sites launched around that time or later have fallen by the wayside. But does this durability in fact reflect sustainability in the sense that it has secured the necessary resources by demonstrating its value, or is some other factor responsible for its survival? What has happened to the aspirations expressed in 2002? And how does it compare to what else is available in 2012, on a Web that may well be over a thousand times larger than a decade ago?[13]

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[13] Estimating the size of the Web is problematic. Much of it cannot be readily found or is not included in search engine indexes for one reason or another; "size" might mean websites, pages, or volume of data; not all "pages" are useful, and many modern web applications don't use traditional pages anyway. Search engine indexes still reflect the growth, however, and Google has

A mixed picture emerges. By mid-2005 MMW-O had effectively switched into maintenance mode. A summative evaluation undertaken by NMSI's own staff in December 2004 (NMSI Visitor Research Group, 2004) had recommended some small improvements that were implemented, but according to Bud and Nahum nothing has changed since then. MMW-O's raw offer therefore remains much the same as when it launched in 2004. But whilst MMW-O stood still the world caught up and in some ways left it behind; certainly, more recent comparable websites tend to differ from it in significant ways.[14] As Bud (2012) remarks, "what was cutting-edge in 2004 and really was a question of dreams in 2002 – honestly, a decade later, interactivity, social media, all those sort of things are required as well." Users' expectations have evolved, technology has opened up opportunities that newer sites have exploited, competitors have appeared and partnerships developed, and MMW-O has been unable to respond to any of these developments. Whilst one cannot point definitively to one factor behind this, Bud and Nahum offer some clues:

> Part of the complexity was the director of the time very much supported it [...] He left the museum in 2005 so it was very much by 2006 the last director's product. (Bud, 2012)

Attention moved onto other projects. "[We were] working for years on several new galleries and that really took most of the museum's attention", observes

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reported that it indexed 1 billion pages in 2000 and hit 1 trillion URLs in 2008. (Alpert & Hajaj, 2008).

[14] For a sample of well-regarded educational museum websites of the last 15 years, the archives of the Museums and the Web awards, of which MMW-O was itself overall winner in 2005, provide many examples: http://www.museumsandtheweb.com/best.

Nahum (2012) "and from the web team's point of view the re-do of the physical and online offer".

How much MMW-O's effective stasis in this ever-developing milieu has reduced its value proposition, or limited its potential, is extremely hard to tell from the available material. The best available proxy for value is that the site long since exceeded its target of six million visits over a ten year lifespan, reaching a maximum of around 1.5million/year, but according to Bud (2012), the method of counting visits has changed in recent years, making comparisons with earlier figures difficult. However, there are other ways to track overall interest in the website: significantly, we can see that Google searches for the site have been constant since 2006, following a peak at MMW-O's launch in June 2004.[15] The site remains the first result offered for that search, and it therefore appears likely that both user awareness and the resulting searches and visits have not changed substantially since 2006.

Looking ahead, Bud emphasises an increasingly important international role for the museum, due in no small part to the internet and which in turn mandates a more international style for such resources:

> I think the web can [...] enable us to escape from being a museum in
> the southeast corner of a small island. If we're going to get global
> funding then we need global users. And things like MMW bring us a
> global usership [*sic*] [...] If we were going to develop this [we might

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[15] For 2006-2012, searches for "making the modern world" have averaged around 60% of the level seen from June 2004 to December 2005, or 40% of the absolute peak reached at launch June 2004. Data retrieved from Google Trends, October 2012 http://www.google.co.uk/trends/explore#q=making%20the%20modern%20world&cmpt=q.

have to] address the question about British versus global styles. (Bud,
2012)

But it seems that building upon MMW-O itself is less likely than learning from the lessons it offers. To develop a global style and offer international stories with less British-sourced material might in any case require a new sort of partnership, which Bud is exploring with peers in Europe. Nahum, for his part, expresses excitement at how MMW-O's original aims might be better achieved through new platforms and modes of interaction than a website could ever do:

> In my mind we were always making a publication, and digital books
> on tablets are in a way closer to what I thought I was trying to make
> as the content guy [...] So given the chance I would certainly do it
> again but with a different kind of target. (Nahum, 2012)

Despite the original plans (Bud, 2002a) MMW-O did not bloom into a wider digital media programme, and nor did the NMSI reuse either the assets that were created for it or the tools that were built for it. Consequently, according to Bud, MMW-O's legacy within NMSI is most clearly discerned in some its later digital products: "You will see how *Brought To Life*[16] draws upon the experience of MMW very clearly, has a genetic descendance". Beyond NMSI, however, as Farrows (2012) points out, MWR successfully commercialised the production tools by building them into their Magic Studio software, as well as reusing them in other digital heritage projects: the economic and cultural impacts of the ISB's investment therefore appear to have extended beyond the project.

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[16] See: http://www.sciencemuseum.org.uk/broughttolife.aspx.

The fact remains that MMW-O continued to run almost a decade after its launch, doubtless in large part owing to the commitment in the original ISB bid to support it for 10 years. Bud notes that the commercial and technical partner has long since ceased to be able to provide technical assistance, should this have been required, noting that as a result 'it's now our responsibility'. As Farrows (2012) points out, however, NMSI chose not to enter into a longer-term support arrangement with MWR once the initial project was delivered, nor to collaborate on any further development. It is apparent in any case that little maintenance has been required, owing largely to the technical choices that MWR made – and the same choices would in fact have made it easy for "any web development agency [to] have supported the service". The technology underlying the site is relatively simple and robust and Bud reports no significant failures since the launch, which is a remarkable record. NMSI hosts the site on an internal server, which perhaps makes the cost of hosting less visible than if there were a monthly bill for it. Running costs appear low, then, and consequently, even if the marginal value of the site is slowly degrading, it seems to be secure at present.

2.1.3 QUESTIONS ARISING

Making the Modern World – Online offers us a historical example of a valuable product built to last, and of how it has fared over the long term. When we turn later to our principal case studies we will analyse the processes involved in their conception, planning, build and early history. Our aim here, however, is simpler: we look to MMW-O simply to highlight some of the important aspects of sustainability that have emerged in its relatively long history.

Bud and his colleagues themselves identified several threats to the project, three of which are risks that can also be seen as long-term hazards for sustainability: a lack of user buy-in; misalignment with institutional values; and premature obsolescence. These risks can be re-expressed more generically in terms that we can take forward into the cases studies. The first and second amount to a loss in the value of a product, either because a group of users value it less, or because the product's owners put a different value upon the benefits experienced by its users. The third reflects the simple need to support a product to keep it functioning and relevant – both technical support and the maintenance and adaptation of content and form. This demand for resources leads to the cost of value production. These same 'risks' can be seen more neutrally as scenarios or challenges that need to be evaluated on the basis of some level of information. The evaluations then feed into a decision about whether to commit resources to a product, which pivots on a cost-benefit equation that will be unique to the specific product and its decision-making stakeholders, and thus we see a fourth factor figuring into whether a product will be sustained: the decision-making process itself. Measurement and evaluation – of success, of cost, of risk – are also evidently important in decisions. Finally MMW-O also showed a moderately complex set of stakeholders, illustrating how projects reflect a compromise between the aims of each, from partners to funders to users. This equips us with a number of questions around the location and creation of value, the nature and supply of resources, and the process of making decisions, all of which can be taken into the case studies.

In the event, supporting MMW-O has required few difficult decisions to be made, and the product continues to quietly serve its purpose without further investment. But it does provoke thoughts about what might have been had NMSI sought to build upon it. Farrows (2012) reveals that MWR did discuss with NMSI the possibility of a partnership to licence MMW-O content for a variety of uses "to provide a more sustainable model" – and that the idea had, in fact, always been a part of MMW-O's sustainability plan; yet these proposals did not transpire. Farrows (2012) describes how, in his experience, the idea of licensing disaggregated content that users could also edit tended to sit uncomfortably with museums' commercial departments and how they viewed the value of their intellectual property at that time: "they were more interested in setting up new physical shops, publishing books or building a new online commercial image library: they didn't see the business case for a separate digital education proposition".

One issue that MMW-O highlights is that, apart from anything else, we have little idea of how successful it is aside from the crudest of proxies: visitor numbers and the responses of peers. Bud remarks that, fundamentally, "the thing about sustainability is, is it still working?", but this suggests perhaps the most basic question to accompany us through the rest of this thesis: is it really enough just to keep a resource going, or does that not in itself constitute sustainability in the absence of a really clear idea about the impact it has? MMW-O is one answer; is there another?

<p style="text-align:center">*</p>

MMW-O has indicated the framework of the problem that this thesis investigates, offering a historical perspective and bringing to the fore three key ideas of value, of resources and decision-making, which we will build upon in chapter 3. At that point we will also undertake a fuller investigation of the idea of stakeholders, which appear to have a very important role both in the definition and location of value, and on the resource side of the equation. Before that, however, it is helpful to take a look at the context in which UK museums are situated, to which the rest of this chapter is dedicated.

THE SUSTAINABILITY CHALLENGE IN THE UK CONTEXT: FLUX, UNCERTAINTY AND OPPORTUNITY

The years since 2000, when the plans for what was to become MMW-O were emerging, have brought many changes for museums seeking to become effective in the digital space. Whilst stability makes for (relative) predictability, changing circumstances often make it much harder to accurately predict how well a product or service will perform, or what will be required to keep it going; at the same time, however, change can bring enormous opportunities, and few would argue that the recent rapid evolution of digital culture is change on a grand scale, nor that it is closely tied to technological developments. We will make the case here, however, that these technological developments are but part of a suite of interconnected processes or trends, a dynamic system within which museum digital projects and products sit. Such products are, of course, informed and influenced by their environment, both by the circumstances of the time and, crucially, by hypotheses about how things are likely to change for better or worse. So it is not simply the current state of the affairs that is significant in

deciding what to build and how to build it, but the trajectory of change and the *predictability* of that trajectory, combined with a decision-maker's approach to uncertainty. For example, in MMW-O we have already seen (and we shall see again in our other case studies) a product that was built in a given social and technical context but which also anticipated certain changes, notably broadband in the case of MMW-O. At the same time the project team acknowledged that the future was hard to predict and that there was a need to build in some flexibility to allow for the unknown, and this requirement also informed the resulting product. We see then that both current conditions and anticipation of (or uncertainty about) future conditions leave their mark on what is built.

For these reasons, then, we must look at the wider context in order to understand the sustainability challenges faced by a digital resource. Of what does this context consist? The core dynamic for a digital resource is the relationship between its owner and its end-users, because this is fundamentally where an exchange of value occurs. Any feature of the landscape beyond this relationship that can affect it can be thought of as part of the wider 'context'. The drivers of most interest to us are those that affect its sustainability, perhaps by altering the perceived value of the digital product, or the barriers that interfere with its effectiveness, or the resources needed to address such barriers. The bulk of the rest of this chapter is devoted to identifying a number of these aspects of the landscape that have seen significant change over the last decade and that, as a consequence, have had a discernible impact upon the behaviour of museums investing in or attempting to sustain public-facing digital products. There are without doubt other drivers of behaviour that we will not explore here, but our

emphasis is upon those that crop up in our case studies. They include funding, leadership and political priorities, technology, social change, the law and the profession of digital heritage itself, but all are united by the fact that it is their fluidity that poses both the sustainability challenges *and* the emerging opportunities for museums seeking, at the very least, to run to stand still, so as to serve their ever-evolving audiences.

2.1.4 FINANCIAL INSTABILITY

Museums in the UK have a mixture of funding models, and although the overall structure of funding has not seen major changes since the mid-1990s launch of the lottery funds, the flow through each channel and the expectations of funders have varied. Museums face a continuous task to keep attuned to the requirements of funders and to know where to look in order to find support for new and existing digital products and services.

In 2012 there are around 1800 accredited museums (Arts Council England, n.d.),[17] around half being public bodies of some sort, generally receiving their core funding from central government, local authorities, or via universities, or the armed forces. Many of these organisations also raise a substantial slice of their income through other means. The 907 members of the Association of Independent Museums,[18] meanwhile, represent a sub-sector with a very different funding mix.

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[17] This includes various heritage properties, university and army museums as well as independents and national and local authority museums. The number may be nearer 2500 if non-accredited museums are included.

[18] Association of Independent Museums http://www.aim-museums.co.uk/.

Public funds come in part from central government, which supports the core activities of a number of national museums directly through the Department of Culture Media and Sport, and delegates further funding to arms-length bodies, principally the Arts Councils at present. Local authorities fund far greater numbers of museums, however: no less than one in three of accredited museums (Arts Council England, 2011a). The lottery funds, meanwhile, have transformed the heritage environment with large and small grants to projects (including for digital heritage).[19] Private funding comes from trusts and foundations and charitable giving, as well as from ticket sales and commercial activities that range from venue hire to retail sales and image licensing.

During the last decade, the greatest shock to this picture of funding has come from the financial crisis that hit in 2008 and became a recession that continues in 2012. Significant cuts throughout the public sector followed, including to museums and to the arms-length bodies that disburse funds to them. Local authority museums in particular have been hit hard owing to the budget cuts directed at local authorities by central government. Private sources of funding including philanthropy appear to have had mixed fortunes, with donations from businesses diminishing by 2012 to a point lower than six years previously, whilst foundations and trusts increased their contribution, and individual philanthropy sat between the two (Kendall, 2012; Arts & Business, 2012).

Funding for digital projects remains overall somewhat unpredictable, with projects funded by various means without finance being consolidated into core funding. Whilst this remains the case, museums will continue to face a situation

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[19] The Heritage Lottery Fund distributed almost £5bn to the cultural sector between its creation in 1994 and 2012 (HLF, 2012a).

where they can secure the funds to build a product without being sure how long they will be supported in operating it.

2.1.5 A CULTURE IN TRANSITION: DIGITAL BECOMES THE NORM

Museums considering how to work in a digital environment need to bear in mind not merely what is possible but the readiness of their intended audience for what they offer. The digital literacy of the UK's general public, and in particular its familiarity with the internet, has developed rapidly since the mid-1990s. Digital technology and media have penetrated mainstream culture deeply, if not completely, and have also left an unavoidable imprint on 'old media', from print to telephony to television. In 2011 77% of households in Great Britain had internet access, and 45% of internet users used a mobile phone for access (Office of National Statistics, 2011a, 2011b) - double the figure of just two years earlier.[20] Following familiarity and facility come habits, norms and expectations. Each wave of innovation – whether technological, user experience, legal – sees a process of users adapting to the new, and museums are challenged to adapt along with them.

One might isolate three technology shifts (often also linked with legal, political, design or other trends) that have affected the majority of internet users, each followed by a period in which users get to grips with the new possibilities available to them. Firstly, mainstream acceptance of the World Wide Web between 1994-2000 introduced many people to e-mail and websites for the first time. An entire paradigm opened up, but naturally enough many of the cognitive structures developed around off-line media were reused with the new media,

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[20] The figures in the ONS report cover England, Scotland and Wales.

and with them came expectations and habits. Models imported from the offline world abounded. The navigational structures of many early web 'publications', for instance, were frequently either linear or hierarchical, congruent existing mental models for books, whilst the network aspect of hypertext and the Web remained sometimes superficial. A decade later, even the fundamental idea of a 'web page' itself is often a poor fit with the reality, but it bridged a cognitive gap between the familiar and the possible at the time.

Following this mainstreaming of the Web came a shift to broadband connections. The Office of National Statistics (ONS) registered dramatic growth in broadband uptake between March 2001, when 0% of households with internet access had broadband connections, and 2011 when figure reached 93% (see Figure 2) (ONS, 2009, 2011b). Broadband fundamentally altered the baseline expectation of what users' systems would support. High bandwidth and always-on connections encouraged users to adapt to the idea of high media consumption, with multiple concurrent users on a single connection able to stream video and audio. A quantitative change – speed – enabled a dramatic qualitative shift in the experience of the internet.
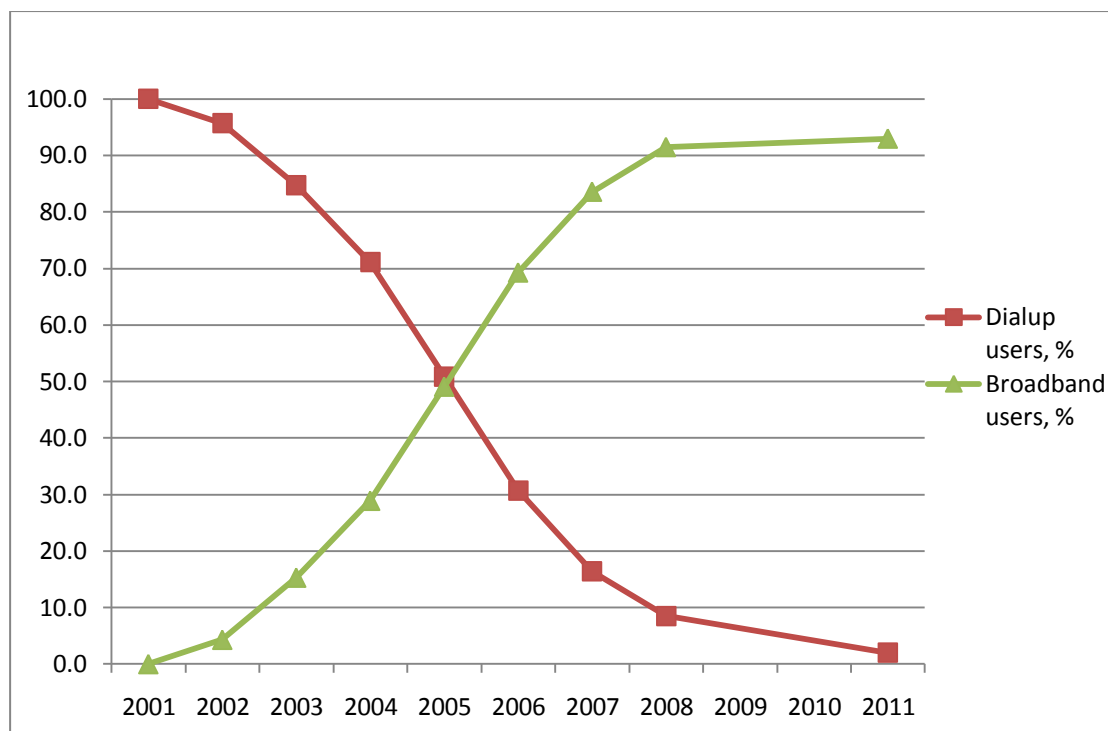
Figure 2: Percentage of UK internet-connected homes using dial-up and broadband connections, 2001-2011. *Source: ONS 2009, 2011b*.

Most recently, the spread of the smart-phones and 3G connectivity (and falling costs of both) have made mobile internet widely attractive, so that in 2011 the majority of internet users included some mobile use in their activity - a doubling in two years. Internet access on the move changes more than merely the availability of digital services: it changes what users can do with those services, and makes new ones possible. The technology packed into mobile devices, from cameras to motion and location sensitivity and compasses, also makes possible activities that are meaningless in the context of a static desktop PC. But ever-present internet on devices that accompany users everywhere has also boosted its use as a social tool and one tied to personal experiences. Social networks on the internet predate the World Wide Web but appear strongly linked to mobile use, with parallel growth curves: in 2011, UK internet users participating in social networks had grown from 22% to 57% in little over three years (Ofcom,

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2008, 2011a, 2011b; ONS, August 2011b).[21] For many users in the UK (and

beyond), then, the shift to a mobile has resulted in digital connectivity becoming

integrated to a previously unforeseen degree in their lives; as a consequence,

social norms and user behaviours are currently undergoing another evolution.

The interactive and social nature of the Web, although often obscured by its

more broadcast-like aspect, has developed into what is sometimes termed a

'participatory culture', and with it a willingness for users to become creators and

contributors – voices rather than just listeners – in an increasing variety of ways,

from simple commenting or tagging[22] to uploading their own media[23], to

consciously altruistic 'crowd-sourcing' behaviour such as editing Wikipedia[24],

geo-referencing maps[25] (or creating them from scratch[26]), or transcribing ships'

logs[27] or records of the Holocaust.[28] Each fresh attempt to capture the

knowledge, creativity or responses of users is faced with the need to build their

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[21] The Ofcom and ONS reports methodologies probably vary so the figures may not be directly comparable. Unofficial estimates suggest figures over 70% but may be less reliable e.g. Thinesen (2011).

[22] Any number of projects, sites or generic software products could be cited, with blogging platforms like WordPress being an excellent example. However amongst museums the Brooklyn Museum of Art is amongst the most innovative in the way it has built tagging into their collections online but also into their entire online engagement effort. http://www.brooklynmuseum.org.

[23] The two preeminent examples of users uploading content, primarily for their own purposes, are Flickr (http://www.flickr.com) and YouTube (http://www.youtube.com). Both were successful enough to be bought by search behemoths Yahoo! and Google, respectively.

[24] See: http://www.wikipedia.org.

[25] For instance, see New York Public Library's *Map Warper* project http://maps.nypl.org/warper/.

[26] As on OpenStreetMap (http://www.openstreetmap.org)

[27] Old Weather (http://www.oldweather.org) is an example of a museum (the National Maritime Museum) engaging deeply with crowd-sourcing, appealing to an enthusiastic community to turn hand-written logs into data amenable to scientific modelling of climate change.

[28] The World Memory Project (http://www.worldmemoryproject.org), a collaboration between the US Holocaust Memorial Museum and Ancestry.com, ties crowd-sourcing explicitly (but not exclusively) to a public interest in family history.

trust and explain the merits of participation; however this has become easier to achieve as the idea of deep engagement and contribution has moved towards the norm online (Arts & Business, 2010).

We see, then, that users respond to their own ever-changing circumstances by constantly adapting their behaviour. Social norms are a part of this; that is, socially accepted and normative patterns of behaviour that help to govern how people and organisations relate to each other online, but can also inform attitudes to the law,[29] or, indeed, how people relate to museums. Changing user expectations then challenge museums to direct their efforts in new directions, for example by participating in another social network or responding to demands for particular material online. One fundamental decision is simply whether it is better to be ahead of user expectations and attempting to develop interest, or behind them and responding to the demands that an audience brings to the museum. It only requires a cursory look over the last fifteen years, however, to see that many companies and trends that at one time seemed set to change habits forever have not retained traction,[30] making it a difficult proposition to assess which options are worth investing effort in.

2.1.6 *POLITICAL CHANGE AND STRATEGIC UNCERTAINTY*

The activities of museums are framed in part by the willingness of their stakeholders to support them. For public bodies – and to a lesser extent independent museums – this means that the political context is a significant influence. Whilst their core mission and values may be relatively resistant to

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[29] See for instance Lessig (1998). Lessig's ideas will be explored in depth in Chapter 3.

[30] In the area of social media alone, MySpace, Friends Reunited, Bebo, Second Life, Google Buzz and Google Wave might be offered as examples of sites that either had high traffic or great expectations but have found their users deserting them.

change, the business priorities of a museum may be more readily adapted, whether to satisfy core funders or in seeking support for project funding.

The New Labour government that arrived in office in 1997, in the early days of the Web, placed a strong emphasis on education, access and diversity, and these priorities were reflected in policies such as the restoration of free admission to national museums (Department for Culture, Media and Sport, 2011). Meanwhile the *Renaissance in the Regions* programme, run by the MLA from 2002 to 2008, targeted around £300m at non-national museums (Renaissance Review Advisory Group, 2009).[31] *Renaissance* placed a strong emphasis on the accessibility of collections and upon widening audiences, and a number of digital projects were supported to this end, for instance the Museum of London's *Reassessing What We Collect*.[32] In the early 2000s significant investment was also directed towards developing museums' e-learning resources with support from the lottery funds, Renaissance, and the Department for Educations and Skills (Hooper-Greenhill, Dodd, O'Riain, Clarke & Selfridge, 2002).

Although Wales, Northern Ireland and Scotland have developed or are developing their own strategies for museums (CyMAL, 2010; Department of Culture, Arts and Leisure, 2011; Museums Galleries Scotland, 2011), England has not, and it has been argued that the lack of a strategy leaves English museums especially vulnerable to political change.[33] This may be especially true given the

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[31] Renaissance is now run by ACE, and is no longer "in the Regions", with the structure of regional hubs being replaced by a centralised model.

[32] See: http://www.museumoflondon.org.uk/Collections-Research/Research/Your-Research/RWWC/About/.

[33] The Museums Association has pushed for the adoption of national strategies, but as David Anderson (director of Amgueddfa Cymru and MA board member), has pointed out in the pages of

change of government in 2010, which has led to somewhat contradictory impulses to both centralise control (for example with council tax caps) and delegate responsibility away from central government. A reorganisation of the strategic bodies responsible for heritage, and dramatic cuts in funds to local authorities in the absence of a statutory requirement to provide museums or national strategic plan, have combined to create an unstable political (and funding) environment, especially for England's non-national museums.

European political initiatives, law and funding are becoming increasingly significant in the area of digital heritage. This may be in part because of the current tight financial situation motivating museums to explore what funding is available from the European Commission, and it may also reflect the global nature of digital media, which has raised a host of issues that require international approaches, from legal alignment to market liberalisation or regulation, to data standards and openness. We will look in more detail at some of these questions in Chapter 5.

A number of strategic bodies also contribute to the professional environment within which UK museums are situated, some implementing government policy and others acting as guardians of standards, facilitators, or advocates. Arts Council England adopted of much of the role previously held by the Museums Libraries and Archives Council (MLA) in 2000, but the MLA (and its predecessor

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the MA's journal, the establishment of individual strategies for the nations means that "in terms of governance, the United Kingdom has ceased to exist as a cultural entity." (Anderson, 2011).

A debate at the MA around the subject at the 2011 conference can be heard online at http://soundcloud.com/museumsassociation/12102011-conference-audio-come and includes the MLA's perspective, given just at the point that its responsibilities were handed to ACE.

organisations[34]) had previously been involved in many early digital initiatives. Its digital brief was in large part passed over to the Collections Trust[35] in 2008. CT now leads the UK representation within Europeana and has run several related projects, and its Collections Grid aggregation platform is the main channel for UK content into that service. CT also maintains the SPECTRUM standard for collections documentation and processes and engages in various other data standards initiatives, giving it a high profile in the museum computing community and considerable influence in evolving practice.

2.1.7 TECHNICAL CONTEXT

Digital media may not be solely led by technology, but it is inevitably enabled by it and heavily influenced by technical developments, which can have positive or negative effects upon existing products. The last decade has, of course, seen myriad advances and trends in this area, many influencing the digital products emerging from UK museums. The richness and fluidity of the technical context that faces organisations is itself a challenge, as even the largest of museum new media departments barely matches the size of a small independent software house, and as a consequence they cannot hope to be able to evaluate all of the possibilities that face them. Whilst it may be of limited use to dwell upon trends that are already relatively ancient history, a brief survey of some significant ones can at least suggest to us the patterns that may recur.

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[34] The Museums and Galleries Commission merged with the Library & Information Council to form Resource in 2000. Later transformed into the MLA Council, its duties were finally distributed between ACE and the National Archive from October 2011.

[35] See: http://www.collectionstrust.org.uk.

The 'Hype Cycle' model developed by Gartner, an influential research company, (see Figure 2) has been widely adopted as a heuristic for calibrating expectations about technology at different stages of development (Gartner Research, n.d.).
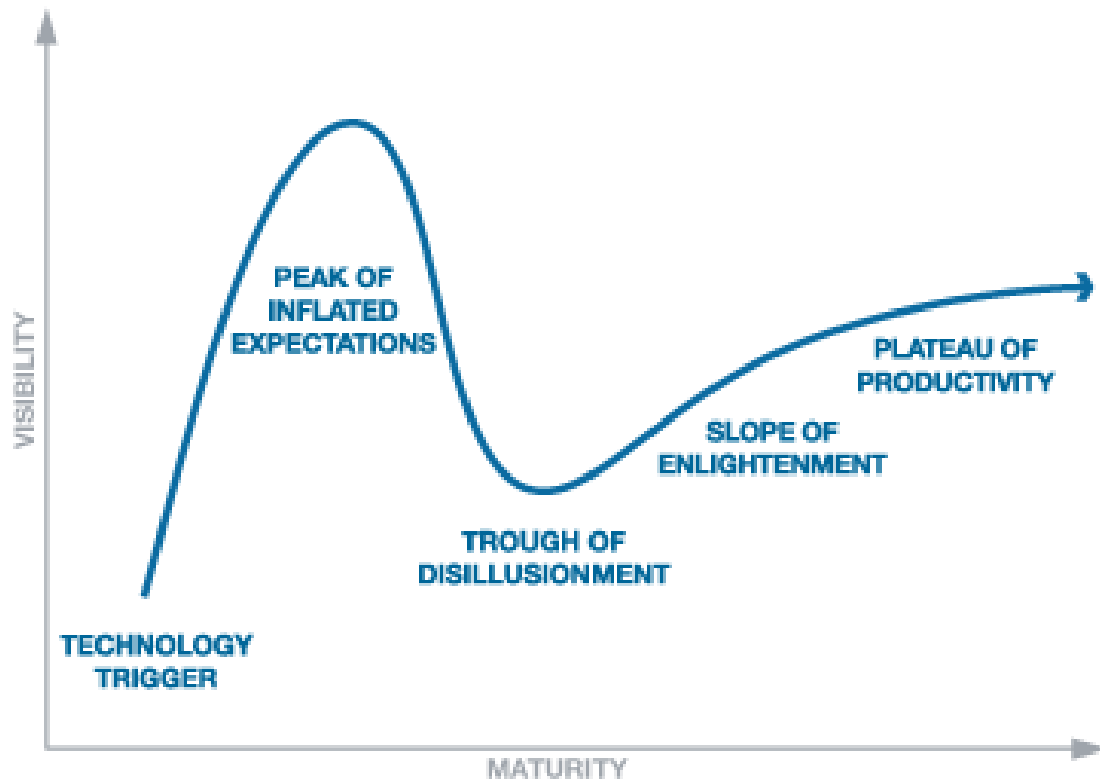
Figure 3. The Gartner Hype Cycle. *From Gartner Research (n.d.).*

If nothing else, the hype cycle's curve is a caution against excessive enthusiasm before a technology (or particular suppliers of it) is adequately mature. As a gross generalisation it can probably be said that museums are generally satisfied to be behind the curve – that is, to work with technology somewhere to the right of the 'trough of disillusionment' – if only because of the wish to be confident of a return on investment, and as stronger technology suppliers emerge. It is worth noting that the curve reflects the visibility or expectations of a technology, not its efficacy. Some, indeed, are abandoned well before reaching the 'plateau of productivity'.

2.1.7.1 Hardware

In the realm of hardware, as we have already touched upon, broadband and mobile technology have had a profound effect upon what museums and other content providers choose to offer. The raw computing power of consumer equipment (in terms of RAM and processor speed) has also increased exponentially, so that machines in 2012 are several hundred times more powerful than in the mid-1990s,[36] and storage costs have plummeted.

The implications are broad. Increased power has enabled evolutions in software that permit museums to try things that were previously impossible, or to bring in-house operations that could previously only be delivered by out-sourcing. Virtualisation – that is, the simulation of physical hardware through software – has also blossomed on the back of increased power, and led to the commercialisation of 'cloud computing' spearheaded by Amazon Web Services since 2006.[37] The result has been a small revolution in the way that museums plan for capacity with much lower barriers to entry, because it is no longer necessary to invest in hardware in order for an organisation to try something new or to respond to unexpected demand (high or low) for a service. Capital investment has been replaced by an operational cost. In addition, whilst the benefits of Moore's Law (Intel, 2005) might previously take several years to

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[36] "Power" is difficult to express, but measures including clock speed, 'floating point operations per second' and the density of transistors on a chip (which according to the famous Moore's Law doubles approximately every two years) have all increased by this order of magnitude over that period. For consumer PCs the amount of RAM is perhaps the simplest indicator of performance gains. In 1995 top-line PCs had typically 16Mb RAM (Windows 95 required 4Mb). In 2012, Windows 7 needs at least 1Gb (2Gb for a 64bit machine) and most PCs will have at least 4Gb (Microsoft, n.d.-a, n.d.-b). In terms of storage, a typical high-end PC now ships with a 1Tb hard disc, 1000x that of the 1Gb disc in a top 1995 PC.

[37] See: http://aws.amazon.com/.

work their way through into cost savings only when hardware was replaced, with cloud computing the impact is immediate.

Interface devices saw less fundamental change until smart-phones and tablet PCs brought touch-screens to the mainstream, along with motion sensors, compasses, microphones and other sensors. As discussed above these have opened up a new set of opportunities and challenges for museums, and this can be expected to continue with the spread of gestural interfaces and haptic technology as are currently found in phones and in gaming consoles like Microsoft's Xbox + Kinect (Microsoft, n.d.-c).[38] The difficulty for organisations faced with these developments is the proliferation of options whilst technology is immature and many providers offer their own approaches. This diversity must surely be followed by a phase of standardisation.

2.1.7.2 Software and services

Delivering digital media to a museum's public audience involves for the most part generic software that is found widely outside the sector, whether development and design tools, server software, or even specialised business systems such as for ticketing and retail. One class of software that has emerged that is tailored to museums, however, is the collections management system (CollMS). For many museums, offering access to some or all of their collections online is the starting point for a deeper engagement with and service to their audience, and inevitably this is closely linked to the evolution of the CollMS as the master repository for data around a collection, and indeed to the gradual

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[38] Vendor Ideum has demonstrated preliminary work with Kinect for controlling multimedia in a museum environment, but as yet there are few other implementations (Ideum, 2011).

adoption of a CollMS for this role.[39] The result has been a lowering of barriers to reusing collections data by gathering it together and standardising it, helping museums in building their own applications but also making it easier to participate in the sorts of collaboration that we will explore in Chapter 5.

A wider trend has been seen in many of the categories of software that museums use to serve the public, namely the spread of free and open source software (FOSS). Although it is not easy to assess how many museums make extensive use of FOSS in their digital outreach, there is little doubt that it now forms a significant part of the software landscape.[40] Many advantages are claimed for FOSS,[41] but these may be less important than the fact that the most rapidly adopted technologies of recent years have predominantly been open source, including Python, Node.js, Ruby, Solr, and Hadoop, along with long-standing workhorses such as MySQL and PHP. This may be the external context, of course, but whether any of these is appropriate for a given institution is a more complex matter.

The development of standards in technology has been another strong theme since the 1990s. In web standards the motivation is especially strong, because of the merits of being able to ensure that the widest possible base of users can have the same experience. Public-serving bodies such as museums have both legal and ethical duties in this regard, as well as a straight- forward interest in audience

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[39] It is notable that even the largest museums have taken a long time to achieve this. The Imperial War Museum used around 150 individual databases for different parts of the collection before they were brought into a single system in 2006, whilst the British Museum continues this model for the collections management data (location, conservation status, acquisition data etc), although it holds descriptive metadata in a single system.

[40] Open source web servers underlie the great majority of websites (Netcraft, 2012), whilst Linux dominates operating systems on servers.

[41] For example by the Free Software Foundation http://www.gnu.org/philosophy/free-sw.html.

reach. At the same time, the actual state of browser technology and user uptake

has been an important consideration. A number of factors are driving change

here at the present time, notably the rapid evolution of browsers;[42] the

widespread adoption of CSS3 and the HTML5 standards (although the latter is

still in draft (W3C, 2012); and the flourishing of mobile and tablet devices and

operating systems. Whilst standards are taking root, however, it remains a

challenge for museums to decide whether to adopt the prevalent technology of

the time, or what they judge may be a better long-term bet.

Whilst we are considering the evolving technological milieu for digital heritage in

the early years of the twenty-first century, and how it has affected museums

planning how to build and sustain digital services, we should look at one more

significant trend that has begun to profoundly affect how museums think about

their digital activity. The semantic web (W3C, n.d.), as Tim Berners-Lee

nominated it, has been a subject of discussion for over a decade, and whilst it

remains far from complete the intervening years have seen significant steps. In

brief, its objective is to enable a web of computable data rather than a web of

relatively dumb content. Data would connect to other data in such a way that a

machine can navigate across multiple sources and combine the information into

something new. On this basis novel applications can be built that break out of the

information silos of individual data owners. A complex technical architecture

accompanies Berners-Lee's full vision of the semantic web (W3C, n.d.-b), but this

is gaining traction amongst museums less rapidly than the more essential idea of

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[42] Google's browser, Chrome, has had broad uptake since 2008 and now updates itself automatically and frequently. Firefox has followed this trend, meaning that a majority of web users now have browsers that are the latest release. Microsoft's Internet Explorer has also iterated with increasing rapidity, with versions 7, 8, and 9 released in 2006, 2009, 2011 respectively, and 10 slated for 2012.

opening up and mixing data. Increasing numbers of institutions now offer collections data for download or as application programming interfaces (APIs) - services that programmers can integrate directly into their applications. The impetus to open up data may be approaching normative behaviour amongst heritage organisations as expectations grow amongst their peers and amongst a data-hungry audience of third-party developers that certain classes of data will be freely available. At this point we see software development intersect with public expectation and legal constraints, and museums themselves are challenged to rethink what it means to be the owners and guardians of the information around the collections they hold in public trust. This is a challenge not just to the technical staff that might be charged with opening up the knowledge-base, but to the executives that set the philosophy of the organisation, and the years ahead will reveal whether this apparent trend becomes accepted as best practice amongst UK museums or is regarded as not being an essential part of their public service remit.

2.1.8 DIGITAL HERITAGE PROFESSIONALS: ACCEPTED AT LAST?

Digital technology has been used within museums for several decades, but until the advent of the Web the emphasis was less on using it to serve the public directly than as a tool for internal purposes. Indeed, as Parry traces in his account of the early days of museum computing, computers were seen as a risky and costly proposition that failed to adequately demonstrate their benefits to many museums until at least the 1980s: 'the plain truth was that it took some twenty-five years [after 1967] before most museums could begin to see the benefits of data entry' (Parry, 2007, p. 118). The role of computers has expanded immeasurably since then, but the fit of digital media within museums can at

times still seem insecure; likewise that of the people that work within digital heritage. This uncertainty may affect the commitment of the organisation to digital projects or its ability to deliver and support them. It pays, then, to survey briefly how the situation has developed in recent years.

As the Web grew, the costs of desktop computing were tumbling, and these two factors contributed to digital media bursting out of the back-office and a small number of gallery installations and establishing itself as a major channel for public communication. As Parry reminds us, however, a serious skills deficit that had been apparent from the earliest days of museum computing continued well into the 'new media' age, with a shortage of skills in web management particularly evident (Parry, 2007, p. 122).

As organisations began to experiment with using the Web as a medium of communication, they might choose to use external expertise and/or to undertake the work somewhere within the organisation.[43] Whilst staff using computers for their (relatively) long-standing role in documentation continued to be situated in the curatorial and documentation departments, when this new public-facing work was undertaken in-house it could be found in various places, sometimes migrating as the needs of the organisation or its understanding of the fit of the Web with its activities developed. An example was the Museum of London, where the first website (launched in 1997) was built and run by an outside company and managed day-to-day by an interested curator, until the establishment in 2002 of a 'systems team' that also brought general ICT operations in-house, and which was built on a backbone of staff from the

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[43] In the case of local authority museums, in-house work would often entail using the authority's own services.

museum's archaeology unit, where the greatest computing expertise previously

sat. This team included dedicated web developers for the first time. As we shall

see in chapter 4, the department was later broken up and the web team brought

into the press and marketing department, until later rejoining ICT. In parallel, the

learning department had a digital projects manager, whilst there were pockets of

digital activity in the archaeological archive and in a clutch of Renaissance-

funded project roles. This situation reflected perhaps both the growing scale of

digital activity and the fact that this growth could occur through projects and

departmental initiative rather than a coordinated strategy of the organisation.

The place of technologists – and technology – in museums remains open to

negotiation. Nevertheless as digital technology and processes become intrinsic to

more and more of the work of museums – public-facing or internal – they are

increasingly making their way into strategic and business plans, and a number of

organisations have developed digital strategies over recent years.[44] These are

indications of a more mature relationship with technology, leading Parry to

suggest, when introducing his 2010 review of the state of digital heritage:

> [museums] can reflect upon several decades of caution provoked by a
>
> set of technologies that for a long time, for most museums, were seen
>
> as expensive, high-risk, over-hyped and requiring an unfamiliar up-

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[44] For instance, technology was one of 6 core strands in the British Museum's plan for 2006-7. In another example, in 2007 the Royal Albert Memorial Museum in Exeter commissioned a report from Simulacra to frame the development of ICT in the rebuilt museum, including its vision and core aims. Meanwhile at the National Museum of Wales plans for a Virtual Museum of Wales were baked into the development plan for 2006/7-2014/15. And by 2011, in part owing to the example set by the Smithsonian Institution in the US, which developed a digital strategy known as the Smithsonian Commons which was deeply integrated with the organisations wider activities and purpose, various UK museums had also assembled wide-ranging digital strategies. (British Museum, 2006; Simulacra, 2007; National Museum of Wales, 2006; Smithsonian Institution, 2009; Stack, 2010; Stein, 2012).

skilling of the workforce. [...] [M]any of these same museums can

today equally point to new directorates, new workflows and new

strategic aims within their organisations. (Parry, 2010, p. 1)

The very idea of 'digital heritage' has taken root in the wider museum

community, with strong professional networks[45] and postgraduate courses or

research groups in several UK universities.[46] The professionalisation of the field

is underway, and with it standards, norms and peer review, and a voice in

mainstream museological discourse. This is the context in which practitioners of

digital heritage are situated today, and equally importantly it is a context to

which, increasingly, the decision-makers in museums refer in order to

understand what 'good practice' looks like. The precise relationship of

technology to the wider museum may still be in flux, then, but its importance is

no longer in dispute.

2.1.9 THE GROWTH OF DIGITISED COLLECTIONS

Digital interpretation and communication is little without digital content. For

museums, this can often be taken to mean digitised collections, although of

course it can be much wider than that. Nevertheless, digitised collections can be

a reusable raw material in a way that some other forms of content – discursive

text, for instance, or guided learning resources – may not be, and they are a

central part of many digital products and the past decade has seen a very

significant investment in increasing their volume and quality. It is very difficult

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[45] Most notable for UK museums are the UK-based Museums Computer Group and the US-based Museum Computer Network, along with the long-standing Museums and the Web conference (held in North America). In recent years Europeana and the related DISH conference have also brought many UK museum technology practitioners into contact with their peers.

[46] Universities in Leicester, Manchester, York, Nottingham, Newcastle and London all run such courses.

to ascertain the number of items in UK museums that have been digitised in some form (that is, a digital derivative made, not simply a database record), and many will not be online. However by adding up the contents of the Culture Grid, the UK's chief channel into Europeana and the online collections of some of the national museums and larger regional museums we quickly reach 2 million items with media,[47] likely a gross underestimation even of the material online, never mind that which has been digitised but is not so readily accessible. A large enough quantitative increase has meant a qualitative shift in the options open to museums, and also makes possible partnerships such as Your Paintings,[48] the Google Art Project[49] and Europeana (see Chapter 5).

The challenge of digitisation (and of the preservation of collections of digital material) remains enormous, and the accelerating progress made in the last decade still leaves the vast majority of the UK's heritage unaddressed. Organisations need a means to decide what to digitise, to what quality, and whether there are any compromises to be made along the way balancing up their own priorities with those of their many stakeholders (JISC, 2005. Further work can be found at http://www.jisc.ac.uk/digitisation).

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[47] An estimate compiled in early 2012 using the following online collections: Culture Grid; the British Museum; the V&A; NMSI; Imperial War Museums; Royal Museums Greenwich; National Portrait Gallery; Museum of London; Birmingham Museum and Art Gallery; National Museums of Scotland; Royal Albert Memorial Museum; Leicester Museums; Wallace Collection; SCRAN. Some notable museums do not have their collections systematically online, although they may have considerable digitised materials on their sites – the Natural History Museum being an example. Note also that 'digitised' here could mean any quality of image from record shots to giga-pixel scans such as those undertaken at the National Gallery.

[48] See: http://www.bbc.co.uk/arts/yourpaintings/.

[49] See: http://www.googleartproject.com/.

2.1.10 COMPETITION, CO-OPERATION AND COMMERCE

The content landscape for museums, and the options that it makes available, extends beyond their own holdings, and beyond what they themselves do: it is as much about competition, about offering something distinctive, and about finding a fit into the bigger picture; and just as in the offline world, it is as likely to be a commercial company that offers a threat or an opportunity as it is another museum. Wikipedia, for example, has become an important feature of the environment for a combination of these reasons. The iconic, crowd-sourced encyclopaedia has provoked a variety of reactions amongst heritage professionals, from concern at the quality of the content to enthusiastic participation and direct engagement with the community of 'wikipedians'.[50] It poses questions about how a museum should best respond in order to answer to its mission and users whilst also avoiding compromising itself and safeguarding its narrower interests. Should it attempt to attract visitors to its own content, help to improve what they can find on Wikipedia, fill the gaps in provision that it leaves? Can museums, with their claim of an authoritative voice, still offer something of additional value beyond what emerges from the anonymous 'crowd'? How should it react when its images are used without permission?[51]

Many other sites and services pose comparable questions, by occupying part of the niche that museums might wish to occupy but also offering potential

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[50] The British Museum was the first in the UK to bring a 'wikipedian' inside its walls in 2010. Matthew Cock, Head of Web at the BM, remarked "I looked at how many Rosetta Stone page views there were at Wikipedia - that's perhaps our iconic object - and five times as many people go to the Wikipedia article as to ours", neatly illustrating the significance of the site as a first stop in users' quest for knowledge (Wikipedia, n.d.).

[51] The National Portrait Gallery threatened litigation in 2009 after a number of its high-resolution images were taken and distributed through Wikipedia. The issue was later resolved; it also served to stimulate a dialogue between the communities and arguably relationships have become much stronger as a result (BBC, 2009).

opportunities for them to achieve their aims by alternative, possibly cheaper, means. For instance, many have elected to use Flickr for hosting images, not simply for its convenience but because of the community around it and the power of its API, and several have gone a step further with Flickr Commons,[52] offering material with a declaration that it has "no known copyright restrictions". In return they gain engagement and, frequently, the contributed knowledge of a large user-base.

Knowing and going 'where the people are' has been a key driver of museums' engagement with social media sites such as Facebook, Twitter and Google+. Whilst the latter are purely social networks, others – like YouTube and Flickr – have a specific focus to which the social aspect may play second fiddle. Both categories have become important and on the whole have dissuaded museums from attempting to build their own social software and networks.[53]

Co-operation between heritage organisations and commercial or non-sector partners has long existed, especially in the area of digitisation (see, for instance, the Heritage Image Partnership (n.d.); the arrangements between the National Archives and a number of commercial partners for digitisation of the censuses etc (National Archives, n.d.); and the Google Book project, which we will revisit in chapter 5). In recent years this has started to broaden out, with more joint efforts to build complete user-facing applications by and for mutual benefit,

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[52] http://www.flickr.com/commons/ Currently 8 UK museums, libraries and archives offer around 11000 images this way.

[53] A notable and successful exception (outside the UK) is the Brooklyn Museum of Art's "Posse", a network built around a focused online activity: describing images of the BMA's collection. However the BMA also uses mainstream networks like Twitter, Foursquare and Facebook heavily and integrates all of these into a coherent strategy. See: http://www.brooklynmuseum.org/community/.

although whether 'partnership' is always the right term is open to debate, some having more of the character of channels for content. A case in point is the BBC's partnership with the British Museum to produce *A History of the World in 100 Objects*, a deep, cross-platform, year-long media event that took co-operation to a new level. The Google Art Project and Google History Project take another approach to using museum collections in a curated setting. It remains to be seen whether these gain wide traction amongst museums and users, or whether they will maintain the good graces of the commercial partner, and this is surely a major consideration for organisations deciding whether to commit scarce resources to such ventures. Such is the risk, however, of partnerships for mutual benefit: they may turn out not to be, and so dissolve.

There are any number of approaches that museums can take to the quality of continuous and rapid evolution of the ecosystem of peers, competitors, services and collaborators within which they sit. One thing that is clear is that it is far richer than a decade ago, and offers a constant stream both of opportunities to evaluate and of potential threats to whatever sustainability model underlies their digital resources.

2.1.11 THE LEGAL CONTEXT

The legal context is the eighth and last of the aspects of the environment surveyed here. Electronic communications have evolved so quickly that legislation has often lagged behind, and organisations needing guidance on how to act have been left waiting. Various pieces of legislation have informed museums' digital activities, for instance the Disability Equality Act (2010, and predecessor legislation), the Freedom of Information Act (2000), and the Data

Protection Act (1998), but in 2012 the greatest area of legal uncertainty inhibiting decisions may be around copyright and licensing, which exemplifies how change and uncertainty in legal matters can make it difficult for organisations to make decisions or to understand the value and costs of what they have.

Two fundamental characteristics of the internet have contributed to much agonising over copyright and licensing: its global nature, with few practical barriers across the borders of many of the world's states; and the triviality of copying and modifying media, code and content. The laws of different states, meanwhile, remain un-reconciled, resulting in frictions and confusion over, for instance, the "moral rights" philosophy applying in France or the "fair use" doctrine of the US. Both users and copyright owners can consequently be unclear about what law applies to whom and in what circumstances, and there is a constant flow of innovation testing the limits of the law, from Napster via YouTube to, most recently, Pinterest.[54]

Alongside this there has been a growing movement questioning the ethics involved in aspects of rights law and contrasting the systems of different countries. Legislators have started to respond to this, both with legislation focused around enforcement and by re-examining the foundations of copyright and the frameworks for licensing.[55] Perhaps ironically, there have

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[54] Pinterest is an enhanced bookmarking or scrapbook service, where its users post images and content that they have found round the Web and share them with contacts. There has been concern over what constitutes reasonable fair use of the content that is shared, leading Pinterest to introduce an opt-out mechanism for websites that didn't want their content shared and to amended their terms and conditions (Pinterest, 2012).

[55] In 2010-2012 there were several attempts worldwide to introduce tight legislation to reduce copyright violations. All came up against stiff opposition based upon their implications for an open internet and free speech, but whilst the US's PIPA and SOPA were not passed, the UK's

simultaneously been moves in both Europe and North America to extend the length of copyright terms for various works. Grassroots movements to open up content and data have grown up, notably Creative Commons and the Open Data movement, and a new breed of licences have appeared,[56] and crucially this has been reflected in strong government action in the UK[57] as well as at European level (as we shall see in Chapter 5) and further afield.[58] A further positive step came in September 2012 with the adoption by the Commission of a proposal to permit certain uses of orphan works (European Commission, 2011a); overall, however, the legislative landscape remains hard to predict for museums planning their digital activities.

For heritage organisations, a good deal of uncertainty remains around the terms under which they should make their material available (if at all) in order both to serve the public and still support their operational stability, and this is also tied to the question of funding digitisation and digital preservation. This has not stopped many from moving to commercialise their collections online through licensing and print sales websites, but there is also a strong trend to release large volumes of media (images in particular) under liberal licences both in the UK and

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Digital Economy Act, Spain's Sinde and New Zealand's equivalent legislation are now in effect. Significantly, in July 2012 the European Parliament refused to ratify Acta, a worldwide agreement that would have included most European countries including the UK, following concerns about liberty and privacy, however the Commission continues to favour it (European Commission, 2012a). For an overview of European actions on copyright see European Commission (2012b).

[56] The Creative Commons licences (http://creativecommons.org) are widely used for content such as text and images, and open data licences also exist. In software, where licensing has long been a militant issue, the Free Software Foundation (http://www.fsf.org) acts as spiritual leader to the open source movement – also relevant to museums which frequently use open source software.

[57] The UK government releases non-personal, non-sensitive data through http://data.gov.uk/ , which is seen as "the first step in creating a network of re-useable government data".

[58] In the US, increasing amounts of federal data are available through http://www.data.gov/.

globally. Some UK museums have used Flickr Commons, as noted previously, to release material, but the others including the V&A, British Museum and Imperial War Museum have made tens of thousands of images available for free reuse.

The National Archives developed the Open Government Licence (National Archives, 2010) in 2010, which acts as a template for how public bodies in the UK should treat material for which they or the Crown hold the copyright. It is likely the OGL will inform many organisations considering how to licence their content in the coming years, but Chapter 5 will also show that a further influence in this area is coming from the European Commission and Europeana. The sorts of arrangement that heritage organisations have made over the last decade with commercial partners (such as between the National Archives and Ancestry.com) may become a thing of the past, but whether this will impact upon how much digitisation occurs remains to be seen.

In 2012, then, museums face considerable uncertainty over licensing and need to accommodate this in their plans for investment in digitisation and dissemination; but at the same time clear trends are emerging and increasingly organisations are preparing for an environment where they are expected to loosen the strings attached to their digital assets.

CONCLUSION

This chapter has attempted to show how one pioneering museum digitisation project was conceived and built in the relatively early days of the World Wide Web and yet continues today in spite of greatly altered circumstances, with important changes in every area of the environment, from funding to the political consensus, from technology to users' habits and expectations. With that in mind,

we turned to a review of some of the notable factors that provide the background to museums' efforts to build and sustain digital media, some for their historical impact and others that may prove to be more significant in the coming years. This landscape both informs the rationale for the existence of any digital heritage resource or activity, and influences the provision of the means to bring it into existence and sustain it. With a little exploration it seems as though we can turn up any number of connections between different parts of this landscape: social trends – we might say, human nature – driving technology, and technology feeding back into new behaviours and norms; heritage organisations finding their place in a mixed digital economy of commercial and non-commercial agents; funders reacting to policy-makers, and law-makers responding to developments in the market of digital services; and tight links between those digital services and technology, too. The picture makes it clear that the value proposition of anything digital that museums build might be disrupted from an unexpected direction; equally it suggests that any assumption we might make about either the resources required to sustain a product or the means to secure those resources could be undermined by shifts in the wider environment. This does not necessarily mean that all strategies will be equally vulnerable to disruption, but it does underline the importance of understanding the context in which museums sit.

We might argue, then, that the greatest sustainability challenge is uncertainty about exactly what lies ahead: if benefits were certain to exceed the costs then it might be straightforward enough to decide to invest in building or sustaining a product. But instead flux, and the risk-taking it requires, thin out the field of

contenders. Yet, excitingly, it is also flux that offers the chance for some digital resources – and some museums – to be innovative and to differentiate themselves.

That organisations depend upon and attend to external factors just as they do internal ones may be a truism, but it is also a foundation stone for our approach in this thesis. In Chapter 3 we will develop the themes of value, resources and decision-making further, and with them build a normative model of digital sustainability. This model will then serve as a lens with which to examine the two remaining case studies *in their context*, in the hope of gaining insights into the real relationship between digital resources, their environment, and their sustainability.

3 KEY CONCEPTS

THE THEORY OF SUSTAINABILITY

3.1.1 A FULLER DEFINITION

At the start of this thesis we offered a preliminary definition of what

sustainability means within the bounds of our study; that is, that it refers not

merely to the continuation of a state, but the continuation of an activity, a

process or the ability of a product (or service) to serve its purpose. It scarcely

needs saying that the word is used elsewhere with many subtle and less subtle

differences from this conception. In one widespread use, *sustainable* indicates

activities that use natural resources such as water or forests at a rate that does

not deplete them in the long term. This meaning of the term is sometimes

broadened out to mean activities that avoid negative impacts upon the wider

environment or society, not merely upon the resources upon which the activity

itself may directly draw[59]. Here, then, the sustainability is measured not just by

the ability of the process in question to continue, but by its impact on other

valued social, economic and environmental factors. This is a socially motivated,

stewardship perspective in which the public value of phenomena extrinsic to the

activity itself is an important consideration. An alternative perspective, also

commonly observed, is a narrow economic one in which sustainability is equated

with the ability of an activity (often a business) to support itself financially. This

has much in common with our own definition but is incomplete because in this

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[59] The phrase *sustainable development* was popularised through the *Report of the World Commission on Environment and Development* (also called the Brundtland Report) received and adopted by the UN in 1987 (United Nations, 1987). The term there is understood to mean "meeting the needs of the present without compromising the ability of future generations to meet their own needs".

simple form it neither considers the other resources that may be required, nor the impact of the activity besides upon its own resourcing. It is purely pragmatic, concerned with the ability to survive and not with whether, from the larger perspective, survival is the "right" choice.

The term sustainability is also increasingly found in the literature and professional discussions of the digital heritage community. Here it is rarely defined, although from the small body of such literature in which it has been made a central focus (and to which we will return imminently) we can infer that it is understood to mean the ability of a product to secure the resources necessary for its continuation, often resembling the raw financial meaning referred to above (Waters, 2004). In this formal literature the distinction between preserving digital assets and perpetuating the delivery of a service can become rather tangled, as we will see. All the same, an examination of conference proceedings, grey literature and e-mail list discussions of sustainability problems makes it clear that, within the digital heritage profession, there is a strong interest in the challenge of ensuring that completed user-facing products are supported long enough to realise their potential, and that this is considered a somewhat separate question from the question of how (technically and financially) to preserve the raw file-based assets produced in digitisation programmes.

None of these established meanings exactly encompasses our needs but all capture salient aspects, and they hold in common a concern with the continuation of activities or capabilities, rather than of entities (even if that activity is one of preserving and realising value from some sort of a "thing").

Considering them together we can start to conceive of sustainability in a holistic

fashion, encompassing the ability of an activity to secure the resources it needs

without depleting them to its own detriment, but also the impact of that activity

upon the wider world, and, crucially, the feedback relationship between the

two.[60] We can assert that sustainability is reached when some sort of balance is

found, wherein a process generates benefits and through this productivity

secures the resources required to continue to do so, for some period. At least in

the realm of digital heritage, the on-going viability of a service or product is also

dependent upon one or more decisions, and often (but not always) these relate

to the allocation of the resources that are needed to support the product in

question[61], there being typically alternative uses for the same resources. [62] Thus

the decision-making of one or more parties becomes an intrinsic part of this

desired equilibrium. It is useful also to conceive of a sustainability challenge as

being simply the demand for something (something to be done, something to be

provided) in order for value to continue to be produced. Whether these barriers

to value creation are active threats to existing value generation, or passive

opportunities for potential value generation, is almost incidental from this point

[60] Gail Dexter Lord, a museum management consultant (responsible, together with Barry Lord, for the *Manual of Museum Management* (The Stationery Office, London, 1998)), whilst writing about the sustainability of museums in general, offered a concordant definition of sustainability: *The ability of a system to function into the future without being forced into decline through the overloading of the key resources upon which it depends* (Dexter Lord, 2002).

[61] Non-resourcing decisions might also seal the fate of an enterprise, for example a legal decision or the choice to close it down for ethical reasons. On their own, non-resourcing decisions are unlikely to be sufficient to ensure the continuation of an enterprise, however, only its termination.

[62] In most scenarios, resources are limited practically by human choices. There usually exist in the world more people, more money, or more of whatever resources are required to continue an activity. But these are nevertheless not unlimited, and scarcity obliges choice. There will be cases where a resource is literally limited, however, and cannot be reallocated from elsewhere – some environmental resources, unique artefacts or individuals, for instance. More frequently, there will be cases where a resource is effectively limited, because those with the ability to secure it from elsewhere are beyond the influence of the stakeholders with an investment in the product at issue.

of view – although from the perspective of an organisation contemplating them they may be worlds apart. It is worth noting that this does not negate a narrower conception of sustainability which will still be relevant on a day-to-day basis for many organisations and products, in which the value of the product as conceived and the resources available to support it are essentially fixed (as they generally are on a short-term basis). Ultimately the equation is the same – can the value justify the resources? – but without an option to increase resources in the short term, the practical questions bear more relation to the decisions that had been made that affect its maintenance.

We have in mind, then, an idea of sustainability wherein an enterprise is enabled to produce value through a combination of decisions and resources, and that the three elements have potentially complex relationships. In the rest of this chapter we will look in greater depth at some of the previous work undertaken on sustainability; outline some important aspects of value, resources and decision-making; and finally attempt to build these into a more coherent model of the dynamic of sustainability.

3.1.2 SUSTAINABILITY ON THE AGENDA

Digital sustainability has been a point of discussion within cultural heritage since the Web burst into the mainstream in the mid-1990s, if not before. Initial work focused to a large extent upon the preservation of assets rather than the sustaining of products and services, however, and it took several years before the literature started to turn in this direction. All the same, the literature from this 'preservation phase' raised some pertinent issues.

Libraries, archives and academic institutions undertook much of the early work

on digital preservation, perhaps because for these professions it was obvious

from an early date that their domain and responsibilities were now extending

beyond the physical and into the digital realm. The written word largely

translated into electronic form without the need for a re-conceptualisation of its

essential quality; consequently, once electronic-only material started to appear

in quantity – as journals, research data, and a variety of media formats – the need

for approaches to its preservation, and for technical solutions, became pressing.

One priority area was tackling the problem of changing formats, hardware and

software, which could be addressed either by format migration[63] or by

emulation.[64] In the UK, for example, JISC[65] supported projects such as

CAMiLEON[66] and Cedars, [67] both of which focused on emulation, with migration

where necessary. The standardisation and registration of formats were closely

related to both approaches to preservation, and were an active area of work for,

for instance, the UK National Archives' PRONOM activity[68] and the EU-supported

MINERVA project (Minerva, 2003). Meanwhile in the US in 2000, the Library of

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[63] For example the conversion of one word processing document format into another.

[64] In this approach, software is used to emulate other software and hardware systems so that the original byte-stream (the unaltered file) can be rendered as originally intended long after the environment in which it was created becomes obsolete or unavailable. Key arguments for and against each approach are usefully laid out in Rothenberg (1999, for emulation) and Bearman (1999, for migration), and in a third paper by CAMiLEON's Granger responding to both (Granger, 2000). Lawrence, Kehoe, Rieger, Walters & Kenney (2000) also look at both from a risk management perspective.

[65] The Joint Information Systems Committee, a partnership of the UK's higher education funding bodies that delivers ICT services and undertakes relevant research for the education community http://www.jisc.ac.uk/.

[66] CAMiLEON ran from 1999-2001 (CAMiLEON, n.d.; Wheatley, 2001).

[67] Cedars (1998-2002) was a collaboration between three universities. It developed guidelines for handling preservation metadata, intellectual property rights (IPR), collections management, and technical strategies for preservation, emphasising emulation for retaining access to obsolete formats (Cedars Project Team, 2001).

[68] See: http://www.nationalarchives.gov.uk/PRONOM/Default.aspx.

Congress initiated the *National Digital Information Infrastructure and Preservation Program* (NDIIPP),[69] which was charged with developing US policy on the collection and archiving of digital content. Its early work on the selection of formats identified factors that could potentially be problematic for or helpful towards the preservation of a given format (NDIIPP, n.d.-a). Whilst this had a decidedly preservation-orientated flavour, it nevertheless started to point in the direction of more outward-looking, sustainability-like concerns. For instance, the impacts of patents or of external dependencies are as relevant to the sustainability of a user-facing service as to the functionality of a media file in a digital asset management system.[70]

As we remarked earlier, museums have generally been less active than some other sectors in researching digital preservation, perhaps considering that their digital collections contained few primary digital assets whose loss would be irreversible. Preservation challenges nevertheless exist for them, and are particularly significant for their 'born-digital' collections. Digital art and culture are targets for collecting institutions that find themselves challenged to translate traditional curatorial practice to non-physical assets (Grau, 2003). The Variable Media Network, with roots in New York's Guggenheim Museum, developed a set of guidelines that grappled with the problems of preserving art-works in non-traditional media, including digital as well as works that might be tied to particular physical artefacts, spaces or transient conditions (Variable Media

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[69] See: http://www.digitalpreservation.gov/.

[70] The full list of "sustainability factors" includes: disclosure; adoption; transparency; self-documentation (of the digital object as a feature of the format); external dependencies; impact of patents; technical protection mechanisms (NDIIPP, n.d.-b).

Network, 2005).[71] Their method emphasised the importance of the creator in determining how best to persist the essence of the work, and provided a framework for analysing the attributes of a work, independent of media, and then deciding which were fundamental to its intent. From this, a preservation strategy could follow. There is much overlap here with the concept of significant properties we will return to shortly.

In the first years of this century, then, in work such as that of the NDIIPP and VMN, we can see the beginnings of a shift in which preservation concerns start to widen out to consider wider issues. As well as these two examples, the Institute of Museum and Library Services[72] and the National Initiative for Networked Cultural Heritage (NINCH, 2002), both also in the US, developed guidance on the full spectrum of activities around building and supporting digital collections, from digitisation through to preservation and long-term funding, each explicitly using the term 'sustainability' (in its financial sense). The problem of preserving and managing digital collections segued into one of sustaining the management activity itself. And as early as 1999 the Council on Library and Information Resources (CLIR) was convening discussions amongst museums and libraries concerning the issues of getting their collections, not merely digitised, but into online services (CLIR, 2000, 2001). Whilst still limited to digital collections, then, the literature now shows more concern with the question of how to build and

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[71] The VMN approach was also intended for non-digital works, including recordings of artworks that were not originally on media at all, such as performances or installations.

[72] The IMLS supported the first edition of *A framework of guidance for building good digital collections* (IMLS, 2001), later editions of which were supported by the National Information Standards Organisation. The latest edition can be found at http://framework.niso.org/.

manage them in such a way that resources can be secured to realise value over the longer term.

At the same time, and with the Web itself growing, the movement to preserve this new space in some way was gathering pace, a task undertaken by initiatives such as the Internet Archive[73] and the UK Web Archiving Consortium.[74] This made more urgent the need to get to grips, both technically and conceptually, with how to preserve complex networked entities. The nature of networks and of the technology meant that archiving could never preserve all of the characteristics or functions of a website – which was not, in fact, a problem unique to networked media. The Cedars project had developed a concept of *significant properties* to 'to describe those components of a digital object deemed necessary for its long-term preservation' (Cedars Project Team, 2002).[75] By defining the 'underlying abstract form' of a digital object, its intellectual content, functionality and medium could be separated, prioritised and managed appropriately. Like the philosophy of the Variable Media Network, the idea of significant properties brings us a step closer to the idea of sustaining that guides our approach by prioritising the *purpose* of a digital object rather than its simple preservation.

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[73] The Internet Archive is a non-profit organisation founded in 1996 with roots entirely separate from traditional cultural heritage organisations. Its objective, however – "to build an Internet Library" – is strongly aligned with many such organisations (see http://archive.org/about/about.php) and it has alliances with some of them, including the Library of Congress and the Smithsonian Institution. Through its Wayback Machine (http://archive.org/web/web.php) users can view many billions of web pages archived over the past 15 years (including some of the digital preservation references cited here, which are, ironically, now otherwise unavailable).

[74] http://www.webarchive.org.uk/.

[75] The idea of significant properties was subsequently widely adopted, informing the work of such projects as InSPECT (http://www.ahds.ac.uk/about/projects/inspect/) and INFORM (Stanescu, 2005). For further discussion see Research Libraries Group (2000).

The Humanities Advanced Technology and Information Institute (HATII) at the University of Glasgow contributed to much of the work we have already referred to (with NINCH, CLIR, NISO and the DCC). It also housed the *espida* project, through which Currall and his colleagues (including Laurie Hunter, of the university's business school) introduced an economic or accounting perspective to the preservation of information resources (*Sustainable Preservation of Digital Assets in a University*, 2005; Hunter, 2006). Recognising that 'digital preservation is an investment decision' (Currall, Johnson & McKinney, 2005, p. 9), they proposed a model based on the "balanced scorecard" from Kaplan and Norton (2001), to help organisations to understand the value of their digital holdings – financial and non-financial – and identify risks, thus allowing more informed decisions on digital preservation. Around the same time, Pennock at the Digital Curation Centre was developing lifecycle models for managing digital cultural heritage resources, which focused as much upon evaluating and understanding the utility of resources as upon their technical preservation – and also built disposal into the cycle (Pennock, 2007).

By the middle of the first decade of the 2000s, then, work on digital preservation was increasingly bearing on digital sustainability, sometimes explicitly. Financial aspects received much attention (see also Bond, 2006), but more emphasis was also being placed upon the *purpose* of the items being preserved, and there was increasing discussion of the problem of supporting the activity of preservation itself – that is, sustaining in the sense we mean here. As the CLIR had discovered when hosting a 2001 discussion amongst museums and libraries, institutions were keen to move from test-bed projects to self-sustaining enterprises (CLIR,

2001). A variety of salient issues were raised around the importance of mission, the shift between build and operation phases, the importance of the value proposition and the question of funding, and notably the potential role of collaboration or partnership in many of these.[76] The discussions inspired a fruitful strand of research supported by CLIR, further exploring the business planning and management aspects of digital collections. Smith (2003a, 2003b) argued that the primacy of mission and of user needs was vital to sustainability, whilst Zorich (2003) surveyed the state of digital cultural heritage initiatives and their funders, and made a series of insightful recommendations. Bishoff and Allen (2004), meanwhile, directly answered the demand for a guide to business planning for digital collections in museums and libraries. In their introduction, business planning is tightly linked with sustainability and is described as a process that must be linked to organisational mission – indeed is pointless without this. Together the CLIR papers bring us very close to the idea of sustainability we will be exploring in this thesis.

The point of view of a major funder was offered by Waters (2004), who, whilst programme officer at the Mellon Foundation, wrote on the question of the sustainability of digital collections.[77] Naturally enough a financial focus was central to his concerns, but accompanying the need for monetary support he pointed to three further crucial factors in sustainability: a tight focus on user needs; designing the resource to scale; and the design of the organization itself.

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[76] Dexter Lord (2002) wrote in similar terms but with respect to museums as a whole, again stressing the centrality of both planning and collaboration.

[77] The paper is ostensibly about the sustainability of digital "scholarly" resources but cultural heritage is part of this picture, and Waters discusses a number of projects in which museums played a central role.

"The economies of scale inherent in the digital environment [are] critical to sustainability", wrote Waters, meaning not merely the economies of cost but of value, such that a broader offer greatly increases the attraction of digital collections which could then potentially make themselves so valuable that "their disappearance is not an option". But the shape of the organisation – how it makes decisions, and how resources are distributed, and the balance of its focus – was also vital, Waters argued, suggesting that "few academic institutions [...] are actually endowed with the mission, leadership, accountability, support structures, and other organizational apparatus to serve up collections to scholars worldwide". Altogether new organisations might be required, perhaps including partnerships based in the community of existing organisations.

Seeing a need for a better understanding of business models (just as CLIR had done), the Mellon Foundation helped to found Ithaka, an incubator with a role to bring projects to sustainability. Ithaka's research arm later produce (for the UK's Strategic Content Alliance) a sequence of extensive reports on business models and sustainability (Guthrie, Griffiths, & Maron, 2008; Maron, Smith & Loy 2009; Maron & Loy, 2011). These offer a large number of in-depth case studies and adopt a broad spectrum approach wherein the offer and costs are considered together, with sustainability presented as being closely allied with business modelling and clarity of purpose, and they provide many examples of the challenges faced at the point where a digital heritage enterprise attempts to shift from project to programme status (see also Yakel, 2004).

One of our primary case studies, Europeana, itself has close associations with important research in exactly this area. Two Dutch organisations, the DEN

Foundation and Kennisland (Knowledgeland), collaborated with the support of

the Ministry of Education Culture and Science to produce the "Business Model

Innovation Cultural Heritage" (BMICE) study in 2009 (de Niet, Verwayen & van

Kersen, 2010).[78] BMICE looked deeply into the challenges facing digital cultural

products and how these affect their sustainability. The heritage sector, its

authors argued, "currently faces the challenge of reassessing its underlying

business models and developing innovative approaches to funding and

sustainability"[p. 4]. They placed much emphasis on the problem of ensuring that

digitised materials make their fullest contribution to a "common social capital",

and on the conundrum of raising revenue without conflicting with the aim of

broad accessibility. The BMICE study treats sustainability as a problem of

business modelling, that is, "the framework (or logic) used by an organisation in

creating social and economic value".[79] In this paradigm mission-based value is

the focus, and the external context is also understood to be crucial. The BMICE

authors' use of the term "innovation" is of more than symbolic significance, too,

because it emphasises the role of continuous change (or readiness to change) to

retain relevance and value;[80] the shift from analogue to digital distribution itself

is highlighted as requiring innovation owing to the great changes to both

audiences and costs it implies. BMICE shares much with the approach to

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[78] Harry Verwayen was one of the lead authors of the study and joined Europeana soon afterwards.

[79] In particular the BMICE authors lean on the *business model canvas* from Osterwalder and Pigneur (2010), which uses nine linked "blocks" to describe, on the one hand, the output side (value proposition to end-users), and on the other the inputs required to deliver that, including resources. BMICE modified the model to account for the circulation of resources via funding stakeholders.

[80] Sometimes, the BMICE authors suggest, "current services must sometimes be changed in their entirety to remain of value", p.26.

sustainability offered in this thesis, including an interest in decision-making,[81] but perhaps most relevant of all is this focus upon continuous innovation to respond to the environment – sustainability seen as a dynamic equilibrium.

This more recent body of work, from CLIR via HATII and the DCC to Ithaka and BMICE, has extended the problem of digital preservation into one of management, mission and milieu, with the circumstances in which digital services exist and the nature of the supporting organisation are as important for sustainability as are money or technological solutions. The focus has been upon digital collections and what might be considered more business-to-business services, but there is much here that we can draw upon. The research we present here is firmly within this school of thought.

THE ELEMENTS OF SUSTAINABILITY

In our elementary understanding of sustainability, value is enabled through the supply of various types of resource, and if the two are in some sort of balance then an enterprise may be considered to be sustainable. This concept is central to the argument proposed in this thesis; namely, that sustainability is greatly concerned with evaluations and decisions that are based upon them, and that poor decisions can be a serious threat to "sustainability". We also have inferred that there are decisions being made upon the allocation of resources to any value-creation effort. We will look in turn at each of these essential components – *value*, *resources*, and *decision-making* – and examine them in some depth before we attempt to construct a more detailed model.

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[81] One of its two declared aims is "To provide tools that enable heritage institutions to make well-grounded decisions regarding their role(s) in the digital age" [p.5].

In the following sections, there are several places where we rest our discussion upon economic theory. This reflects the fact that our approach to the sustaining of value generation has much in common with microeconomics and the theory of production. The fact that we are discussing the creation of value in a non-profit context should not distract from this, because whether production is measured in financial terms (as in traditional companies) or in mission-based value (as in the organisations at the heart of our study), economics still has much to contribute in understanding how inputs are transformed into outputs through processes of production, and how equilibria are reached (or should be reached) to maximise the efficiency of exchanges in such processes. So it is useful to keep as a backdrop to our thoughts an abstract concept of production processes as being nothing more than activities that *increase the similarity between the pattern of demand for goods and services*, and the form, quantity and distribution of these goods and services in the market place. This is a recurrent underlying theme in our discussions on Value and Resources that now follow.

3.1.3 VALUE

Businesses and services exist to create value, but 'value' is a complex idea. By its nature it is subjective: value is not inherent in an outcome but is attributed to that outcome by an interested party; it depends therefore upon perspective. The question becomes still more complex when one attempts to understand not merely current value, but potential or *future* value – which is, after all, a principle of most investments, including where an organisation is weighing up a decision about supporting (or building) a digital product for the sake of its anticipated utility.

The context for our exploration of value is, of course, the museum, and the discourse around the value of museum collections is an especially rich starting point. They are pivotal to a museum's purpose, and the system of values around collections has a rich theoretical (and pragmatic) background. Consequently, by looking at how they are conceived of by museums we can learn about the wider culture of values within these organisations, which one might expect in some way also to inform their digital activities. We will then turn to a more outward-facing conception of the museum as a social enterprise, in which the value of its collections and everything else it does derives (in part) from its relationship to a wider set of stakeholders and, through them, with what they value. This public value perspective allows for a broadening of scope, such that the impact of a museum's collections and actions beyond its own walls are included amongst the outputs that it considers to be significant.

Let us consider first the collection, that essential asset at the heart of any museum, which has always been invested with a singular set of values that, as much as any, reflect the way that museums see themselves. Just as museums have evolved dramatically in recent decades, so has collecting practice, reflecting changes in the understanding of value in the component parts and the assemblage itself, and the role of both in serving the museum's purpose. Gurian (1999) offers a meditative but helpful perspective on the changing relationship between objects, collections and museums since the 1960s, and the awkward questions that have been posed concerning what objects actually are and wherein their value lies. One trend in thought over that period (although not universally accepted) is reflected in her proposition that "objects are not the

heart of the museum"; that although they remain essential, they act as "props in a brilliant play [...] The objects, in their tangibility, provide a variety of stakeholders with an opportunity to debate the meaning and control of their memories.". The different approaches parallel the formal and analytical social historical perspectives on objects, in which either the "form" of the object is expected to "speak for itself", or the museum is given to drawing out the historical role of material culture (Moore, 1997).

The idea that stories and memories are the true centre of a museum may not be universally held, but it does reflect a prevailing acceptance that collections and objects are the embodiments or repositories of multiple forms of meaning and knowledge, and consequently contain many axes of potential value waiting to be realised. The importance of socially-constructed meanings in approaching an object has become apparent, along with the potential variety of those meanings;[82] likewise the significance of the personal and subjective resonances of artefacts and their consequent affective role (Hooper-Greenhill, 2000). Fieldwork by Hooper-Greenhill and collaborators, for instance, illustrates the variety of ways in which visitors interpret art in a gallery context, combining their personal associations and existing knowledge with the information accompanying the works to develop an individual interpretation (Hooper-Greenhill & Moussouri, 2001; Hooper-Greenhill, Moussouri, Hawthorne, & Riley, 2001).

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[82] Many of the papers collected by Pearce (1994) address this point both from the point of view of the societies responsible for material culture, and museums seeking to interpret objects for their audiences.

This does not make an irrelevance of traditional curatorial priorities like provenance, connoisseurship or research potential, but they are joined in contemporary collecting policies and practice by this more recent recognition of the latent plurality of meanings and value in objects – indeed they are changed by this recognition. Drawing out these dimensions of an object and providing for different ways to approach it informs not only collecting, of course, but the use of the collection through interpretation, display and research. With this increased emphasis on the public-facing interpretative role of museums, in contrast to their more internal-facing role as guardians and researchers of the collection, we see aspects of a more sophisticated idea of the production of value by and through museums, in which the perspectives and meaning-making of a broader set of stakeholders are admitted and accounted for. This is, however, a contested area within the museum community, and different institutions may place widely differing emphases upon the relative importance of, for example, research activities or various types of interpretation or community engagement (Witcomb, 2003). As with formalist and analyst approaches to objects, here is an aspect of museums' value-making that one might expect to inform their digital products and might usefully seek to identify there.

However, many of the values attached to qualities that are inherent in a physical object do not usefully translate into the digital realm, although attempts are sometimes made to do so. The tangibility of an item, the feelings of being in its presence, a demonstrable and physical link to some historic event or person through a specific piece of the physical world: such phenomenological attributes and experiential qualities are changed by translation into a domain where bits of

data can be replicated without end and are always mediated by the technology of reproduction and display; consequently, whatever value a museum attaches to such attributes is largely sidelined. But the sophisticated, pluralist ideas that have emerged in recent years concerning the role of museums and the value that can be realised through their collections are more readily adapted to the non-physical, and indeed have had a clearly visible impact in many of the digital products that museums have produced for their audiences. And so, with already-difficult notions such as the authenticity[83] or tangibility of objects becoming still more slippery with the digital shift (DigiCULT, 2002), the quality of the *representations and uses* of these objects, and of the information associated with them, becomes ever more important. Thus whilst in a digital space some concepts become problematic, credibility and accuracy remain of high import to users. Questions of authenticity and reality become more issues of authority and trust.

Museums, then, have progressively added new dimensions of value that they aim to realise through their collections, and have recognised that their audiences are as vital to much of this value as is the collection itself. This is wholly in accord with an outward-looking, stakeholder-based public-value perspective, which we will now address in greater depth.

In classical microeconomic theory, the objective of a firm's activity is to generate a financial profit on an investment for the owners or investors; these are the sole

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[83] A full discussion of the notion of authenticity is out of scope here but for an example of the many meanings that can be associated with that resonant but problematic term, we can refer to Bruner (1994), who sketches four conceptions of the idea: mimetic *credibility*; historical *accuracy*; being the *original*; and being *authorised* (perhaps even legally valid). At best these meanings are strongly divergent, and some appear mutually incompatible.

parties for whom a company should concern itself with generating value, and the profit is the sum total of value. In a social business, by contrast, the purpose is to increase the social good. Frequently (in the public sector at least), the function is to spend rather than generate money; here, then, a measurement of value based upon financial return is utterly inappropriate.

In a pair of publications built upon numerous case studies, Collins identified a suite of characteristics that he argues can be found in successful enterprises, both commercial (Collins, 2001) and social (Collins, 2005),[84] but he sums up the crucial difference in realising success thus:

> In business money is both an input (a resource for achieving greatness) *and* an output (a measure of greatness). In the social sectors, money is *only* an input, not a measure of greatness.

An organisation where the purpose is not to generate money but to spend it on the public good, but which must at the same time secure the necessary resources to achieve this, thus faces a fundamentally different challenge to one where the basic inputs and outputs can be directly compared. He proposes what he calls the *hedgehog concept* to describe how a social enterprise can find "greatness", by working to stay at the centre of three circles: staying true to its core values and mission; doing what it is best in the world at; and powering its resource engine. As in several of the studies we referred to earlier (e.g. Maron, Smith & Loy, 2009; Maron & Loy, 2011; Smith, 2003a), then, Collins draws a link between mission-based value and sustainability, and along the way he specifically makes the point

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[84] Collins' ideas have subsequently been used by several of the museum-based authors referred to later.

that delivering value against mission feeds back to provide the resources required to do more of the same.[85]

The approximately 1800 accredited museums in the UK can be considered to be social enterprises of the sort that Collins has in mind. Accreditation itself mandates that a museum be a "long-term organisation that exists to benefit the public and protect collections" (Arts Council England, 2011b, p. 7). This places the delivery of a public good at the very heart of its purpose (although it need not preclude a privately owned museum from generating a profit for its owner) and transforms the meaning of value, relative to that of a for-profit enterprise. But if the purpose of a museum committed to public service – its mission, and the set of goals that derive from it – provides the yardstick against which its productivity is to be measured, that yardstick is nevertheless a complex instrument. For serving others must mean to some extent valuing what they value;[86] the overall public value produced by a museum's activities is the result of some calculation based upon the value it creates for its many constituencies. As we have seen, authors such as Hein (2000) and Gurian (1999) argue that museums have, over recent decades, begun moving away from being object-centred and defined around their collections, and towards being providers or enablers of 'experiences', putting their audiences at the centre of what they do. Others caution that this picture varies greatly, with some institutions focusing more upon their collections and

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[85] Kotler and Kotler (2000) also address the role of mission in museums from the point of view of marketing.

[86] Korn (2007) seems to imply that a museum's staff are (or should be) the source of its "intentions", that is, the outcomes it wishes to achieve that derive from its mission. The staff, by this measure, are the ultimate arbiters of value.

internal drivers than seeking to be relevant to their community. [87] One would still expect, though, that all will seek value from a combination of internal and external impacts. To help us to understand how museums seek to address the needs of external parties we turn to the notion of stakeholders.

The purely financial view of value creation that we mooted earlier is, in truth, rarely considered adequate for commercial enterprises. Economists and executives stretching back at least to Barnard (1938/1968) have observed upon the descriptive and predictive inadequacy of the classical model of the profit-maximising firm, leading Freeman to introduce stakeholder theory into business management thinking (Freeman, 1984).[88] This has led to the emergence of a more nuanced model of what parties – stakeholders – are concerned with an organisation and how they relate to the decisions that managers make. A stakeholder, as described in Freeman's seminal work, is any agent affecting or affected by the organisation in achieving its objectives. This greatly widens the constituency to which decision-makers should give mind, and value creation (or destruction) becomes seen much more broadly than simply as a financial return to investors, even for a commercial body. In addition, because the corporation becomes conceived as an instrumental agent, it adds an ethical dimension: no longer is profit the sole motivation, but some account is taken of the wellbeing of

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[87] Koster and Falk, for example, argued that, in 2007, a sizeable minority of museums still "lack[ed] any tangible sign of proactively entering into a dialogue about relevance" (Koster & Falk, 2007, p. 192).

[88] This is not the first use of the term or concept in literature, but appears to have kick-started the field of stakeholder theory. For a fuller history see Mitchell, Agle & Wood (1997). Bishoff and Allen (2004) exhibit Freeman's influence within digital heritage. His definition of stakeholders is clearly the inspiration for their own, being: "entities that influence or have a stake in the resources or output of the enterprise or are affected by results achieved by the organization" (p. 4). Their work looks deeply at the position of stakeholders in the value chain in a digital heritage context.

other parties. This perspective clearly fits well with Collins' work on the social sector, wherein the relationship between serving the organisation's purpose and ensuring its on-going viability ("driving the resource engine", as he puts it) are inextricably linked.

Precisely what constitutes a stakeholder, though, needs some more refinement beyond Freeman's rather broad definition in order to be useful. For our purposes, it is helpful to distinguish between the agents that have a legitimate claim to be stakeholders in an enterprise,[89] and those that in practice the owners of that enterprise identified as being stakeholders and have considered during the decision-making process. In this way we may spot gaps between theoretical and effective stakeholders. Mitchell *et al* (2007) offer a typology of stakeholders based upon three dimensions: power or influence over decisions; the legitimacy of the relationship with an organisation; and the "urgency" of the stakeholder's claim on the company. This provides us with a means of recognising stakeholder *salience* and whether it translates into stakeholder *identification.* Rentschler and Reussner (2002) offer some examples of museum stakeholders, suggesting that amongst those identified as such there could be "museum visitors, funding agencies, local authorities, museum staff, board members, museum professionals, researchers, sponsors and the media"(p. 5).

There is an important distinction to make between the stakeholders to which a museum turns for the provision of resources (which we can term *resourcing stakeholders*), and those that are sought as end-users of its services (*end-user*

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[89] Whether at the level of an organisation such as a museum, or a product or initiative it delivers.

stakeholders).[90] Each type seeks value, and the museum must provide value to each – it can see either group as a market to which it offers itself – but the fundamental difference remains.

Funders, the classic resourcing stakeholder for museums, almost certainly expect to see a return (or at least make their choice on the basis of past performance), and in a sense the museum is then beholden to the funder to deliver whatever form of value was agreed. The resources it has received are in turn used to create a value proposition for end users. Weisbrod and others have pointed out, though, that resourcing stakeholders do not always have public value as their motivation:[91] relationships with commercial companies in the form of partnerships, sponsorship or contracting can potentially come into conflict with some of a museum's goals even whilst supporting other objectives. High-profile examples in digital heritage include digitisation programmes in which a commercial partner gains some form of exclusivity or profit-making power over the products of digitisation.[92]

At the other end of the stakeholder bench sit the end-users, the public, the visitors: the people for whom a public service actually exists, whose interests are also often the motivation for resourcing stakeholders too, but who have their own set of priorities, their own estimation of the value of what museums do –

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[90] Of course, it is possible to perform both roles. Paying visitors contribute resources, for example. In this case, the value proposition is primarily as an end-user.

[91] Weisbrod assembled a volume of papers examining the influence of commercial practice on the non-profit sector (Weisbrod, 1998). Several papers are pertinent, notably Anheier and Toepler's examination of the commercialisation of museums and Weisbrod's own analysis of the ways in the search for resources from outside parties could interact with mission-based values.

[92] Google Books is the most famous example, to which we will return in Chapter 5. The National Archive's arrangements with Ancestry.com and Findmypast.co.uk to digitise historic censuses and other documents, which are then available in full only to paying customers, are another clear example.

their own definitions of public value. Value to this group is, quite simply, a primary purpose of the museum, and at least when developing public-facing resources a measure of their success should arise from the impact it has upon the user groups it is targeted at. Museums commonly have their own priorities in terms of the audiences they address and an audience development plan to reflect this. Any impact beyond this subset may not be counted.

One thing is clear: with organisations or projects built around the production of public value, the value to the 'owners' is tightly wedded to what is valuable to the stakeholders that the enterprise is there to serve. As Bishoff and Allen (2004, p. 18) put it, "The value of a library or museum is established by its visitors and users". Failure to address stakeholder needs might harm a commercial enterprise's ability to generate the resources to sustain activity, but, as Collins points out, for a social enterprise it affects both the availability of resources *and* the value side of the equation.

Perhaps unsurprisingly, then, the language of stakeholder theory has rapidly become near-universal in discourse around creating public value in some form, and digital heritage is no exception. We might therefore expect a museum's evaluation of the value proposition of the digital services they build and support to reflect the groups that have been recognised as stakeholders, and also the efforts the organisation has made to understand the wishes of those admitted to the fold. We will see how this has played out in our core case studies in Chapters 4 and 5.

We have been using the phrase *public value* as an equivalent for mission-based value within organisations that are dedicated to the benefit of the public, but

without further definition. Perhaps the complexities suggested above help to explain why: it is extremely difficult to describe its limits, if only because every stakeholder may have a different perspective upon it. Nevertheless the idea has been an important part of political discourse since Moore's key publication of 1995 (Moore, 1995). More recently the more specific term *cultural value* has frequently been applied to the expected contribution of organisations such as museums. Both terms recognise the need to deal with the outputs of activities that exist to create social good rather than revenue, and the literature bears witness to the fact that this idea has political currency.[93] One area that has proven contentious relates to what has been termed instrumental value,[94] and in particular the influence that resourcing stakeholders (especially government) can seek over the priorities of an organisation, such that it can create instrumental value on their behalf. Holden (2004) argues that funders can make overly prescriptive demands, and in so doing threaten to push organisations away from the centre of their own mission-driven activities, for instance by encouraging measures of success that reflect an external agenda (such as educational or social policy) rather than the institution's native cultural goals; and meanwhile Gray (2008) suggests that the core intentions of museums consist of "curatorship, education, entertainment and the infra-structural

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[93] Some significant publications on the subject of public value in the UK come from within government or from political think-tanks and research bodies such as Demos and the Work Foundation, highlighting its importance in policy-making circles. See for instance Kelly, Mulgan and Muers (2004) [this key discussion document, with a forward from Douglas Alexander, then Minister of State, drove much discussion of public value in British political circles during a time of public service reform.]; Jowell (2004)[Tessa Jowell was Culture Secretary at the time of writing this essay]; Holden (2006); Talbot, (2008).

[94] The term itself is used in contrast to intrinsic value – the latter is considered to be that value which exists within an object or activity without relation to anything else, whilst instrumental derives from the agency of that item, its use within the world. Several authors have dismissed the distinction as distracting or meaningless. For instance see ESRC, AHRC & DCMS (2008); Coles (2008).

management of resources", which can be replaced by external policy intentions. Gibson (2008), however, counters that to distinguish between the instrumental and intrinsic value of (or objectives for) culture is to set up a false dichotomy; and further, that it is also legitimate for policy-makers to use museums for purposes that she describes as "policies of production".

We do not need to settle on one or other side of the debate around instrumental value; it is, however, useful to observe its compatibility with the notion of a diverse group of stakeholders, each of whom has a claim upon a portion of the value that a museum *could* generate. Their inclusion within the fold of identified stakeholders, and the "urgency" of their claim (to use Mitchell's term), may affect whether or not their idea of public value is accepted; if it is not, however, that does not mean it does not exist, merely that it is not accounted for.

Stakeholders, impact, outcomes, significance, relevance: these terms occur frequently in the literature that attempts to grasp the meaning of "value" to museums; yet our brief survey indicates some reasons why it can still be difficult to know how to translate external value, as experienced by an outside stakeholder, into value as understood by the museum itself. Public value nevertheless remains the primary intention of digital products aimed at the serving the public, and one would expect it to play a significant part in calculating what to build and how to support it; in that sense it is relatively straightforward.

Having considered the importance of stakeholders, one might wonder whether, in fact, there are any forms of value that are entirely internal to the museum, or whether a museum ultimately only values anything because of its impact in the

public realm? If, for example, the value of a digital exhibition derives in part from public trust in the institution that produced it, this is perhaps the expression of such hallowed museum values as authenticity and authority and their fruition into external value. What is essential to a museum's character and its inward-looking perception of its "self" is also likely to be part of what is valued by outsiders. But the distinction between internal and external value may well be an unnecessary distraction – much as Gibson cautioned with regard to intrinsic and instrumental value. It might instead be more useful to consider the connections between the outward and inward facing areas of activity.

Koster and Falk (2007), building on Stephen Weil's approach whilst also paying tribute to Collins' "hedgehog concept", have attempted to tackle the complexity of museums' institutional value with a framework that reflects their belief that "the goal of any nonprofit organization ought not to be to serve public value once [...] but to continuously and holistically do so".[95] Their approach is for the whole museum, but might be applied equally to individual products or activities – but only as part of the entirety of the institution's value creation and resource allocation. External outcomes are understood in relation to serving the needs of audience segments, but Koster and Falk also provide us with some prompts about what other forms of contribution public-facing museum digital programmes might make as "organisational assets", in developing community relationships, or to reinforcing the financial situation or employee satisfaction within the organisation. Some of these areas serve public value only indirectly,

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[95] Koster and Falk's framework posits five aspects of value that should be accounted for, although some come close to resources in the sense that we use here. They summarise them as: public good; organisational assets; community relationships; employee satisfaction; and financial health.

but in order to come to a comprehensive cost/benefit evaluation of an asset an organisation should consider its ancillary benefits as well as its core intent. Kovach proposes organising the areas of activity of the museum as a matrix of goals:

> Strategic management of museums must recognise that there are two types of goal areas: one represents the management-functional areas of marketing, finance, operations etc., whilst the other relates to the generic goals of museums – those of conservation, research and interpretation. Thus, for museums, there is a kind of matrix of goal areas, with each of the traditional management functional goals supporting, to different degrees, the generic goal areas. [Kovach, 1989, p.144]

These "management-functional areas" provide what we might term operational value, and whilst our concern in this research is with products and services whose primary focus is public, in many cases operational value is also sought. Digital media projects quite often find their public-facing objectives are bundled with goals that concern their contribution to internal-facing aspects of the museum's operations. These can take many forms, from revenue raising[96] to streamlining documentation workflow (see Chapter 4), and from reducing inquiries for practical information to generating new knowledge about collections or even the establishment of new partnerships. The benefits may arise as side effects of the process of building a product or through its use. Ultimately, in supporting the organisation, operational value should support

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[96] Several of the case studies in the Ithaka S+R reports involved revenue raising, although whether the purpose was merely to support the service itself or to offset fixed costs for the host organisation is not always clear.

mission-focused value. As we will see in the next section, *Resources*, it is not unknown for organisations with a social mission to use their value-orientated activities to seek resources from stakeholders that are actually used as much to support operational objectives, because the former may be more attractive to donors than the latter – but equally they may limit such tie-ins out of concern that they will deter some stakeholders (see James (1998) and other papers in Weisbrod (1998a)).

Operational value is (or should be) an intrinsic part of a holistic assessment of the value of any digital resource, so as we proceed we will keep in mind what additional contributions digital resources might make to all legitimate goal areas of a museum.

This is by no means an exhaustive survey of the approaches to value within museums, or even within digital heritage. But it provides us with some useful tools when we embark upon our case studies: an awareness of the deep-rooted but complex set of values that revolve around collections and reach their arms through the rest of a museum's activities; an understanding that the flow of value is vital to the relationship between a museum and its stakeholders, whether they are providers of resources or end-users; and a recognition that there is in fact no simple dichotomy between internal-facing benefits and public value, or value to the museum and to stakeholders. This complexity alerts us to the probability that assessing value is unlikely ever to be simple and may in fact be highly political.

3.1.4 RESOURCES
Simply put, a resource is the raw material for value production. If we see a sustainability challenge as the demand for something (something to be done,

something to be provided) in order for value to continue to be generated through the product in question, then a resource can be thought of as a means to overcome a challenge to sustainability. Whether these barriers to value creation are active threats to existing value creation, or passive opportunities for potential value generation that await realisation, the value on the other side of that barrier demands an input of resources. With that said, an organisation may nevertheless perceive a fundamental difference between requiring resources to support existing value-creation activities, and requiring them to realise a new opportunity. Sometimes resources are effectively inexhaustible – a collection, for instance, is not generally reduced by use – and sometimes they are limited – cash, for example.

The production of value and the production of a product are not the same thing. We have treated the latter as a resource here, along with the other raw materials of production, because they can be very difficult to tease apart and because each contribute to an output *through which* value creation occurs. To be clear, this means that in discussing "resources" we are also talking about the *processes of production*, although we treat decision-making itself separately when in fact it is frequently bound up with these processes. Decisions, as we will shortly discuss, concern not only the procurement of resources but the manner of their use.

Two important dimensions of resources figure into the question of how they are procured to sustain a product: their specificity, and their location. We will explore these following a brief introduction to economic theory around resources, especially in nonprofit organisations.

In economic terms, the process of production catalyses inputs (resources) into outputs (goods and services) for subsequent exchange or direct use. Resources and "cost" are tightly linked ideas: the resources used to produce a good are its cost – its "natural value" in an exchange transaction (Buchanan, 1969). But equally, that natural value is purely objective: it gives no idea of cost in the sense that we commonly understand it, that is, what is foregone by using a resource in a particular way; nor should it be confused with economic utility – the pleasure, satisfaction or otherwise positive experience derived by a consumer from a good or service; in essence, its subjective value (and not a unit but a scale of relative preference)(Kapteyn, 1985). From an economic perspective, natural value reflects only the resources invested in a product. Its true cost, however, lies in what was sacrificed by the use of that resource for a particular purpose, rendering it unavailable for alternative uses. We will return to opportunity cost shortly, as a particularly important way of understanding the relationship of resources and value, but we will also be alert to occasions where resources have no apparent cost in this sense, in order to ask, how do such resources play into the decisions of museums?

We can also turn to economics for a framework to analyse the behaviour of nonprofit organisations, including museums. Nonprofits do not conform to the archetypes of for-profit firms in terms of their motivations (their outputs), yet they face the same need to secure inputs. The mechanisms that link inputs and outputs reflect this difference, but in many nonprofit industries (including

museums) there is evidence of hybrid strategies (Anheier & Toepler, 1998).[97]

Weisbrod (1998b; see also James, 1983) models the nonprofit as a firm with the option of producing three classes of product: preferred collective goods (also referred to as public or social goods), which are difficult to sell in private markets and support the objectives of the organisation;[98] preferred private goods, which still support the mission but for which a charge might be made to some or all of the market; and nonpreferred private goods ("ancillary goods"), which do not serve the mission but which are produced purely to generate profits to support the overall goals. He considers that a nonprofit may have two general objectives: firstly, to produce socially valuable (preferred) outputs in line with its mission; and secondly, it may (but may not) wish to avoid particular nonpreferred activities, perhaps because it considers them to be a distraction or because it derives negative utility from entering into competition with private firms. With these objectives in mind, the organisation chooses to provide varying amounts of the three goods according to its own priorities and condition.

The three types of good that Weisbrod describes (preferred public, preferred private and nonpreferred private goods) align approximately with three categories of revenue: donations (gifts, grants and contributions); user fees, such as admission fees, in which a charge is made for a product or service that is also a mission output (and where the charge may differentially target or favour certain groups); and ancillary activities that raise revenue with no direct mission output.

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[97] Anheier and Toepler's evaluate the degree of commercialism in US art museums, but their analysis of the pressures that can cause this are more universal. Many of the trends they observe can also be seen in UK museums.

[98] Preferred collective goods are hypothesised to be the reason for the existence of nonprofits, being socially desirable but unsuited to market provision (typically owing to the difficulty of charging for them).

We will revisit these when we look at external resources. Firstly, however, we need to look a little more closely at the nature of resources themselves, where it is possible to draw a distinction between two broad categories. Those we will term *generic resources* can be used indirectly and in many different ways, and include such things as money, political support, staff motivation and brand – and even time.[99] Generic resources do not themselves create value but enable it to be created through concrete means, which we will term *factors.* In contrast to generic resources, factors are resources in the form of assets and actors (or actions) that serve directly to create value or to address a particular barrier to value creation. Staff, staff training, software, server hosting, content-contributing users, digitised collections: all are examples of factors that address such barriers or opportunities as maintenance work, improved functionality in a service, or an enriched content offer. Factor resources on the whole depend upon generic resources for their supply – as often as not, upon money. In other cases, though – as when using staff already on the pay-roll – the use of a factor resource is purely an opportunity cost. Sometimes, however, they may be available without apparent cost other than a decision to use them. Digital images of the collection are one example; another would be the museum's intellectual property embodied in its people and knowledge systems, which is sometimes formalised as copyrights, trademarks or patents. For our purposes we will continue to use "resource" to refer to both generic resources and factors unless the distinction is

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[99] The importance of "time" as a resource alongside finance is evident in the old project management witticism: "on time, on spec, to budget: choose two". The joke has a foundation in truth, implying that a shorter timescale requires more finance to deliver the same result. Because demand is measured over time, and demand and price are commonly linked, a shortage of time can increase costs and finding an alternative source of time might, therefore, reduce costs. In this sense, time could be considered to be a partial alternative to other resources. This is also problematic, however, in part because of the relationship between delivery time and value generation. See also the "project triangle": http://en.wikipedia.org/wiki/Project_triangle.

pertinent. But we can assume that all sustainability challenges will require an input of factors, and that when they are not already in the possession of the museum, these will often imply a need for generic resources.

For museum digital resources, significant generic resources might include funds, reputation and political support. In the case of funding, larger projects may require direct financial provision in order to secure the factors they need, whether this is through the allocation of internal budget or from external funders. Smaller projects might instead try to secure factors such as existing staff time. In either scenario, though, the way in which the project or the host organisation is funded can have an impact upon its priorities that trickles through to its activities (Toepler, 2006). On the other hand the brand of an organisation, including its reputation amongst its stakeholder communities, the degree of authority given to its statements and actions, and feelings of goodwill credited to it, cannot in themselves be used to create much. Yet these can be critical to recruiting support in more concrete ways, as well as to the counterweight of resourcing: value creation. By boosting the perceived value of a museum and its activities they can feed back in as resources ranging from donations to volunteers to board members (Young, 1998). On the political front, having policy- and law-makers that are positively disposed towards an organisation, or the sector of which it is a part, can be a crucial generic resource that can help to deliver concrete assistance in the form of legislative changes or funding.

Factor resources come in a great variety because of their specificity to any given scenario. This variety and context-sensitivity makes it impractical to attempt a

comprehensive survey, but we will be looking at some examples in our core case studies. Factors for now are taken to include the process of production itself, that is, the actions undertaken using various resources: the technical architecture and build of a product, the workflow of content creation, marketing and audience research are all examples, but the variety of such processes is great and will be explored further on. It is notable, though, that processes are intricately linked to a set of choices in just the same way as is the allocation of the raw materials, and indeed that the links between processes and raw materials are equally significant.

Another important axis along which resources differ is their location relative to the product being supported. A simple distinction between the resources held internally to the museum and those sought externally is a good starting point (Figure 4). Any resources already under the museum's control should in principle be reserved to support its mission, directly or indirectly, as we discussed in the section on *Value*; directing any of them at a digital product typically means deciding not to use it for another museum activity. By seeking resources from external sources, however, a museum attempts to increase the total resources it has available to it, rather than to reallocate internally. Procuring external resources to support a product in theory leads to a bigger total pot, rather than greater internal competition for the same pot, but it potentially has significant pitfalls too – the case study presented in Chapter 4 illustrates this. At the same time, apparently "internal" resources can have more strings attached than it initially appears. What is more, internal competition for

resources can appear very much like competition for external resources. We will look briefly at each in turn.

External **Exchange with** **a provider**	**Generic**	Grants, gifts, contributions Reputation/brand
	Factor	Donated: time (volunteers), material (UGC, colls) Purchased: labour & skill, services
Internal **Opportunity** **Cost (usually)**	**Generic**	Budget allocation Staff allocation Brand
	Factor	e.g. Collections data/assets Hardware Budget allocation

Figure 4: external and internal resources

An organisation with a remit to create social good rather than generate revenue is in essence a machine for expending resources in the direct pursuit of value. In this way, museums are akin to consumers in many of the decisions that concern their public-facing activities, because through their expenditure they are in a sense attempting to procure value *on behalf of* their end-user stakeholders (Weisbrod, 1998b). This makes opportunity cost an appropriate way to conceive of any internal allocation decisions that are required to support an existing product, where a choice must be made between competing claims for the organisation's existing resources. Opportunity cost lets us weigh up the alternative uses for the same resource in terms of the value that resource could

thereby yield. This might be mission-delivering value, or it might be operational value of some sort. For instance, rather than supporting an existing website a museum might choose to invest in a new facility that, whilst delivering less public value directly, may raise revenue that more than makes up for this.

Internal resource allocation itself can have multiple levels. A particular department may bid against others for funds to sustain a product it owns or for a broader class of its activities, at least implicitly pitting its contribution to the organisation's goals against that of other departments' activities.[100] At this level, competition is likely to be for more generic resources, in particular money. There may also be similar competition within a department for its discretionary budget or for factors such as staff time, and decisions on whether, for example, to put efforts into maintaining existing assets or developing new ones. At the lowest level, an individual may face choices about how much of their own time to devote to their various areas of responsibility.

In museums, as in many other enterprises, much of the finance that theoretically might be allocated to different departments is often tied up as labour, and (within budget cycles) unallocated money will be limited to relatively small contingency funds. In the short term, then, the flexibility of that labour in terms of its skills and the possibility of it being reallocated to other tasks is critical to whether or not internal resources really can be switched between activities. Given the specialised nature of many roles within museums, including many

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[100] After all, as Weisbrod (1998b) notes, whilst "nonprofits may behave as if they were individuals with unique utility functions[, t]hey may also behave as if they were run by a committee of managers and directors, each of whom as distinct goals."(p.50) Even where managers do not have different overall goals for the organisation, their departments have different areas of responsibility and they must make a case to secure the necessary resources to deliver on these.

concerning digital media, this flexibility may be limited even if there is a wish to divert labour to another task. Within a department there may be more scope, but this is not guaranteed. One implication is that digital products with less specialised resource requirements may find it easier to secure what they need without looking outside the organisation. This may be one reason why social media activities such as running Twitter and Facebook accounts have become popular in museums and why, anecdotally, the associated duties are sometimes shared by people in multiple departments, even though their cost-effectiveness and reach may be uncertain.[101] In contrast, if a museum loses a developer with the skills to maintain a particular application, it may prove impossible to maintain using only the skills available in-house.

Many products are not big enough to secure their own resources directly but are instead expected to be absorbed into the general operation of a department, and consequently securing internal resources can become the most important consideration for their sustainability. But this does not mean that they do not relate to outside funders at all: after all, an organisation's existing resources often come in large part from external sources, whether from government, an endowment, a sympathetic trust, or ticket sales. Where such revenue streams are not tied to particular functions it is in principle open to the museum to decide upon how they are allocated (unlike external resources secured to support a specific purpose – see below) and we can consider the decision to be primarily an internal negotiation. But even unallocated funds may not be entirely free of

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[101] The remark upon the distribution of this activity is based on anecdotal evidence and observation. Concerning reach: of 107 UK museums and cultural attractions known to be using Twitter in June 2012, less that 20% had over 10,000 followers. Of 200 using Facebook, 12% had over 10,000 Facebook likes. What these figures mean in terms of engagement and return on investment, however, is less easily identified (Museum Analytics, 2012).

external influence, as we touched upon in discussing instrumentalism and as we shall discuss in *Decision making* below.

Externally-sourced resources come through different types of relationship, with parties that may or may not be identified by the museum as stakeholders.[102] As we discussed in Chapter 2, funding from local or central government is a substantial portion of the core budget of many UK museums, and where this is not the case there may be some other body, such as a trust or society, expecting a return essentially in the form of the museum's mission; these are likely to be seen as a key stakeholder, and the transaction is not an exchange in the conventional commercial sense (although funders can equally be thought of as purchasing a service on behalf of the ultimate beneficiaries (Tuckman, 1998)). The "contract" in this case may operate at a general level, allowing essentially internal resource allocation decisions. But on other occasions a grant-giving body may make funds available only for very specific purposes, such as to develop a new digital resource. Again the transaction is one of resources being provided in exchange for anticipated goal-driven value.[103] The factor resources which this money may help to secure, on the other hand, are often sourced from a supplier. Software or server hosting, for instance, can be procured in a relatively simple economic exchange in which the supplier is not regarded as a

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[102] That is, they are regarded as having a legitimate interest in it, such as a value exchange relationship or some power over decision-making (Mitchell *et al*, 1997).

[103] The notion of opportunity cost is just as applicable for funders seeking to disburse finance through museums for social purposes as it is for museums making internal allocation decisions. Their contribution to a museum may be tied to nothing more precise than the delivery of its mission, but a grant-making body will be aware that alternative uses for those funds are possible, and over the longer term will be prepared to switch its attentions elsewhere.

significant stakeholder, although sometimes more complex relationships can develop, more akin to partnerships.[104]

The nature of the transaction is therefore significant, as it can dramatically influence the way in which the resources it secures can be used. A simple commercial transaction with a supplier, such as the purchase of a support contract, need have no conditions other than the exchange of money for services. A non-exchange transaction with a funding body, however, commits the museum to producing a certain kind of value that the funder wishes to see in return for its money. It is much more important, then, to ensure that the objectives of both parties are reasonably aligned, or else (in Collins' terms) the museum will find itself pushed away from the centre of the three circles that define its success (Collins, 2005).

It is worth pausing for a moment to consider the meaning of these transactions between funders and deliverers. There can be intermediaries in such exchanges, each seeking to deliver value according to their mission. To take an example from the UK, the Department for Culture Media and Sport (DCMS) passes funds to (amongst others) Arts Council England to distribute through programmes such as 'Renaissance' (a nationwide museum investment and development programme). We can conceive of a chain of exchanges in which money is passed down the chain with the expectation that social value will be passed back up. Each link is a dyad in which the funds come in as a resource and are passed on as

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[104] A good example in many museums is with the vendor of the collections management system, which usually presumes a long-term relationship in order to be successful. Such systems often need extensive customisation and constant development in order to best fit the needs of the host institution, and at present this is typically delivered through an ongoing support relationship with the vendor/developer.

an output, the *value* of which depends upon how well the outputs at the implementation end of the chain align with the social aims of the bodies that make up each link of the chain. There are many other areas where we can see these resource:value dyads – that is, where the output for one party is sought as the input for another – but it is especially evident where resources are distributed in this fashion.

Suppliers generally provide factor resources, but other external parties do so too, through quite different transactions with the museum. For example, volunteers can make an important contribution to many museums, giving their time, knowledge and skills. Museums also often selectively accept donations of items into their collections. And recently, with the development of online communities and engagement, museums have started to benefit from other "resources" that their audiences submit, in the form of comments, responses, creative content, and digital assets. An increasing number of products depend upon such user generated content, including the crowd-sourcing exercises we mentioned in Chapter 2. Indeed one of the interesting aspects here is that user contributions and engagement can be thought of as both a resource, from which a museum gains directly and which helps to keep such a product alive and engaging; and as an output, an interaction that has been of direct value to the user herself.[105] Finally, resources can come via certain types of partnership, to which we turn shortly.

Whilst grant-giving bodies are often the major source of core or project funding, there are other ways in which money is sought from outside to support a

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[105] McKenzie *et al* (2012) discuss the value chain and the relationships between UGC creators and the providers of the services to which they contribute.

particular digital product. Many museums operate some form of commercial activities, fitting Weisbrod's categories of either preferred private or ancillary goods. Sometimes the revenues these generate will become part of a central budget and allocated as internal resources – profits from the shop or ticket sales, for example – but they may also be tied directly to a digital activity, as when sales of digital images are used to subsidise further digitisation (see also the previous *Value* section). Nonprofits can perceive risks, however, in moving to commercialise their activities, ranging from reducing their reach to a target audience by charging for access (and thus diluting the value proposition that the resources are intended to support), to losing the financial support of donors that perceive a loss of mission-focus or a reduced need for their contribution (Weisbrod, 1998a).

The perceptions of all stakeholders are important in this dilemma, which brings us to the question of brand and reputation, which we touched upon in *Value*. For Collins, brand is a key resource in itself: he argues that, whilst business has efficient capital markets with which to build success upon success, no such markets exist for the social sector. Instead, resources come from building a positive perception with stakeholders, who not only bring support but in their participation *become* a source of value. If the brand clearly conveys what public value the organisation is generating, more support is generated and the resource engine spins faster (Collins, 2005). Once again, then, it is perception of what the organisation is for, and of success, in the minds of its various stakeholders (which should correspond closely to its actual mission) that is key.

Partnerships add another form of complexity to the relationships of museums with resourcing stakeholders. They take many forms, from public-private partnerships with a profit-sharing basis, to certain long-term relationships with suppliers, to peer partnerships in which groups of museums come together to achieve what would not be possible alone. Our MMW-O and Europeana case studies both deal with partnership and we will save a more detailed examination of its implications for later, but on the basis of the preceding discussion we can suggest that the flow of value and resources in such arrangements will be complex, especially where multiple parties are involved and where their ambitions are diverse. We may presume that in some cases there could be no apparent exchange at all, simply the multiplication of value latent in the individual partners' resources, which is magnified within a combined offer. But this itself poses the question of why more partnerships do not come into being or reach a successful and sustainable state. We might posit that there are hidden costs and barriers, whether these are best thought of as demands for resources or in some other way.

<center>*</center>

Often enough resources are not all that readily identifiable as either internal or external, or as generic rather than factor types, and reflecting back on our discussion of operational value it seems that it may sometimes be more appropriate to consider such outputs as inputs i.e. as other factors. Similarly, the distinction between internal and external resources can be unclear. But such reservations do not preclude this typology from helping us to characterise the

dynamics of a particular resource/value system and assessing its quality from a holistic sustainability point of view.

Our discussion up to this point suggests, therefore, that securing and allocating the resources to sustain a digital product is more than just a question of finding the money from somewhere; it is equally important to consider where resources come from and what a product's cost is *in the round*. Opportunity cost almost always plays a part, whether the source is internal or external, but there can also be significant hidden or delayed costs (or unanticipated risks), including impacts upon the value proposition of the product in question or of the wider activities of the museum or its stakeholders. It is not yet clear how important is the distinction between the materials of production and the processes of production in which those materials are used, from the point of view of digital sustainability, but whilst both are closely linked we can also see that there are at least two phases involved in securing a resource and putting it to use. We take this increasingly complex picture of resources, together with that of value, into our next section where we will start to consider the processes by which museums reach decisions about the digital products they build and support.

3.1.5 DECISION-MAKING

In the preceding sections (on *value*, and then on *resources*) we have already touched upon decision-making many times: the problems of balancing inputs and outputs of different types; of weighing up potentially competing sets of stakeholders' values; of choosing which opportunities to forego, and selecting approaches for building a product; of deciding between seeking resources externally or internally, each with its merits and hazards. In writing, it has

proven impossible to completely isolate value from resources from decisions, which merely emphasises the intimate connections between them all.

In this section we will briefly review some of the important evaluations and decisions that we noted previously, and highlight some areas that we think may be important for the efficiency of decision-making, to use Barnard's term. The literature relating museum digital activity to decision-making processes is sparse, but other areas offer us richer material to equip us for the case studies.

We can consider a decision, within the context of this study at least, to be the result of a process of selecting between alternatives when designing a value proposition, creating the mechanisms to deliver that proposition, and procuring or allocating the resources to enable this. Although in the previous sections our focus has been upon the first and last of these questions – the value proposition, and soliciting resources – clearly there are many decisions to be made when turning a conceptual proposition into a product, and these will impact upon the costs, outputs and adaptability of the system, with significant implications for sustainability. These include technical issues, content and programming choices.

Many decisions are not recognised as such but are implicit in the unremarked continuation of previous behaviours or assumptions about preferred courses of action, or they emerge from the collective behaviour of large numbers of individuals (such as users), whose individual decisions mean little but that together are significant. Regardless of their formality, explicitness and significance, though, decisions share some fundamental ingredients, summarised in Table 1.

Table 1: Elements of decisions[106]

An agent	Someone to make the decision
Decision-making processes	Often dictated by context, possibly involving formal structures
A set of desired outcomes	Frequently informed by institutional context
Choices	Multiple recognised alternatives
Information	Information about the requirements for the available choices, and the probability that they will yield the desired outcome
Lack of information	Complete information is rare, and every decision reflects at least an implicit response to the risk that this implies

In our Value and Resources sections we have already looked at outcomes, requirements, and the choices amongst them. Although we also discussed stakeholders, we will shortly look more closely at who is responsible for making decisions, and at the problem of dealing with incomplete information. Firstly, though, we suggest a categorisation of decisions that are important in sustainability.

Decisions on the objectives and design of a product lie at its core, but various other types of decision are required all the way along the value (and resourcing) chain, affecting both the provision of resources and the use of the product. Many of these decisions may be remote from the owner of the product (whether this is

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[106] Drawn from references cited in this section and especially from Hubbard (2007).

an individual organisation or a collaboration), but we are interested also in how these might be influenced by the owner. Closer to home, other decisions indirectly related to the product such as relevant policies within the organisation may also be needed (or else may adversely affect it). Subsequent to the build phase, maintenance and other practical concerns around the sustaining of the product might demand decisions upon any change in its direction, technical solutions to problems, reuse of elements, enhancements or perhaps its archiving or closure. As we noted above, decisions on what value proposition to offer and what resources to seek or allocate are only part of the picture: implementation of these decisions requires technical choices to be made that can affect (in fact, may be choices between) the effectiveness of the value proposition and the durability or flexibility of the product; that is, its sustainability on a fixed set of resources.

The decisions of greatest importance to sustainability include those broadly characterised in Table 2.

Table 2: Categories of sustainability decisions

Value decisions – what sort of value is being created and for whom?	
Stakeholder identification	In- and out-groups, priorities. Stakeholder groups may be linked, and there may be connections with resourcing
Designing the proposition	The essential benefit and form of the product or service
Maintaining the proposition	What content will be created, when? What will be fixed when it breaks?
Resource allocation decisions – where will the resources come from?	

Internal	Opportunity cost
External	A decision made outside the museum (although perhaps with its influence)
Lifecycle plans – how long should it last?	
Expectations of lifespan	Affects what allowance must be made for support after build, and for uncertain future conditions
Transition from building to operating	This may mean moving from project to programme resourcing. Plans, or lack thereof, will affect sustainability
Implementation decisions – how will it be done?	
Product design	Affects potential value, resource requirements for build and maintenance, and adaptability to uncertain conditions
Technical choices	As above. Choices may involve trade-offs between e.g. usability or content creation and flexibility or technical maintenance
Dependencies	Tradeoffs between costs and risks

There are overlaps and interdependencies between these categories, and one might also regard some of the factors that influence decisions as decisions in their own right, for instance policies around risk management, and assessments of impact and cost. This would also be legitimate but we will treat these as information on which decisions are based.

Simon argues that the most important decisions are qualitative rather than quantitative ("structural alternatives", in his terms), and the categories above are

frequently qualitative (Simon, 1978a). It is interesting to consider, though, that the questions of resource allocation and of lifespan may be more quantitative; perhaps, following Simon, they are sometimes less important than we think in comparison to "structural alternatives" such as the nature of the value proposition or the technical architecture of a product?

Decisions may be between binary alternatives, but frequently they are compromises. This is evident in any joint venture, whether the scale is of individuals collectively forming the staff of a museum, or a partnership of multiple organisations. Some form of bargaining often then applies, to reach a solution that solves the needs of some or all of the parties. In *distributive bargaining* there is a fixed amount of a resource, and the normative prescription in this case is to maximise one's gains at the expense of the other party. An alternative approach is *integrative bargaining*, where there is some compatibility of interests and parties can seek to maximise joint profit. This expands the resources for the benefit of both. Experiments reported suggest this happens, and that it is the differences between how players value resources that often provides scope for integrative negotiation (Beach & Connolly, 2005).

We have seen, then, that significant decisions are made all along the value chain, amongst various stakeholder groups as well as inside the organisation, and in our case studies we will investigate further the distribution of decisions outside the museum as well as inside it. However a more basic question also arises: wherever these decisions are made, who is it that in fact makes them?

Simon, a Nobel Laureate in Economics whose work had a major impact upon organisational science, in turn cited Chester Barnard as a key influence on his

thinking about decisions in organisations. As senior a business executive in the 1930s, Barnard wrote *The Functions of the Executive* (Barnard, 1938/1968),[107] in which he explored in depth the relationship between individuals, roles, and organisations. Individuals cooperate as an organisation, and an organisation succeeds, he argued, when (a) it achieves its aims, and (b) it does so "efficiently", that is, it satisfies the motivations of the individuals of which it is comprised.[108] Building on Barnard, Simon argued that the border between individuals and organisations is nuanced, complex, and dynamic, is too rarely dissected and too often the subject of implicit and fundamental assumptions by leaders – whether that assumption is of a relationship of independence or one of reliance and constraint. It may therefore be pragmatic to think in terms of, for instance, organisations or committees reaching decisions, but this will always disguise a more complex situation. In short, organisations do not make decisions: individuals within them do; but these individuals influence one another, and when acting efficiently their interests should be well-aligned and they should make decisions on the basis of shared values. Incentives such as wages can induce an individual to participate in an organisation, but they may not necessarily act in its best interests (especially given that the information about their actions is unlikely to be perfect). If incentives alone cannot be relied upon to induce individuals to work in the interests of organisations, the latter can both service the prior preferences of their employees and seek to alter them through

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[107]. For Barnard, the term "executive" meant any individual that makes decisions in an organisation, regardless of their official role.

[108] Barnard in fact pairs the idea of efficiency with one of effectiveness. An effective choice results in the achievement of desired ends; an efficient one avoids unsought consequences. Sometimes the sought end is attained but has dissatisfactory unsought consequences. This is considered effective but not efficient.

acculturation and training. If an organisation succeeds in this it may make efficient decisions, in Barnard's sense, through the individuals of which it is comprised (Simon 1978a; Simon, 1978b; Beach & Connolly, 2005; Mahoney, 2002).

In Chapter 2 we looked at the location of digital activity in museums, but decisions pertinent to digital sustainability may take place in other parts of the organisation too. Because the possibilities for where this might happen are broad we will reserve further investigation for our case studies, but it is reasonable to suspect that we may find complications that affect the quality of decisions: Moe, for instance, writing from the perspective of political science, alerts us that decision-making is linked to the structure of an organisation, sometimes with negative consequences for effective action, especially if those that influenced the structure have reasons for wanting to limit the power of some parts of the organisation (Moe, 1990).

As with stakeholders within the museum, those outside may also make very significant decisions about both value and resources. The degree to which a museum can affect these is open to question but is potentially important. Negotiation with partners (expected to be predominantly integrative rather than distributive) may find them exerting considerable influence, but some funders or target markets may prove difficult to persuade.

We turn now to a central problem for decision-making, that of incomplete information and risk. The raw materials for choice that decision-makers somehow process are desired outcomes, and information about the alternatives

to be considered for achieving those outcomes. [109] A choice, in Barnard's terms, would ideally be both efficient and effective: delivering the desired outcomes and avoiding undesired ones. But with many choices it is far from certain how effective or efficient they will be because there is inadequate information, not only concerning the available choices but even about what results are sought. Information can come from any number of sources and concern either the inputs or the outputs of the decision, and its selection and analysis can be as important as the data itself. Hubbard suggests that useful sources of information are frequently ignored, often because they are seen as imperfect. He argues, however, that the purpose of information is not to provide certainty but to reduce uncertainty. Uncertainty, however, will remain an aspect of most decisions,[110] and organisations (and individuals) have their own approaches to it, ranging from formal risk management procedures to informal heuristics or the "gut feelings" of an individual (Hubbard, 2007). In negotiations uncertainty can be asymmetrical, either because the parties concerned hold different information or because different information is salient to their respective concerns, and this can play to the advantage of one party or another. Relationships between museums and many of their resourcing stakeholders have elements of negotiation, likewise do partnerships such as MMW-O and Europeana (Chapter 5), and we will be alert for evidence of such asymmetries and their effects.

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[109] Knowing the desired outcomes is in fact critical information too (and is often poorly served), but we can assume that at least some vague outline is known before any choice is considered as such.

[110] Indeed *argument theory* proposes that decisions themselves are motivated by uncertainty because they too work towards its reduction. See Beach & Connolly (2005).

As Hubbard points out, though, there are few occasions where nothing at all is known about the elements of a decision, even if this is nothing more than drawing upon experience of scenarios that are somehow comparable. People learn from experience but so do organisations (Levitt & March, 1990), which have various means of conserving it. This enables the accumulation both of information and of the habits, heuristics, practices and assumptions that are used to make decisions and to cope with uncertainty. This organisational learning can also arrive through sharing the experience of others; by diffusion through rules and standards; or through educational processes. We have seen that these *mimetic*, *coercive*, and *normative* processes (Levitt & March, 1990) have developed in digital heritage over the decades (and before), providing practitioners with some means to evaluate risks,[111] but we have yet to see how much this influences decision-making in practice.

Learning, however it is acquired, can help with evaluating complex situations where the interactions between parts of a scenario can greatly increase uncertainty. For instance, as we discussed in Chapter 2, technology, social trends, and the political and legal environment have had complex interactions which have exaggerated the difficulty of predicting any one of them. Rare or unique events, however, pose a particular problem for learning (organisational or individual), as they occur too scarcely for any patterns to be identified and risks accurately judged. Areas of uncertainty can also be conflated, for example the probability of an outcome may be assessed but likelihood that that outcome will be valued in the future ignored on the assumption that they are the same.

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[111] See "Digital heritage professionals: accepted at last?", 2.2.5.

This problem of assessing the likely value of a product is twofold. Firstly, measuring outcomes can be challenging. Hubbard has much to say on methods for finding useful proxies for outcomes that can be difficult to measure directly, but also on the cost of information which should be balanced with uncertainty and risk it is helping to reduce (Hubbard, 2007). Porter (2006) suggests that a museum's strategy – the "race it chooses to run" – depends centrally upon measuring value, which in turn depends upon choosing, specifying and weighting goals around its activities. In digital heritage, recent research on impact (Tanner, 2012) has attempted to move forward from crude performance indicators to a deeper, holistic understanding of the impact of digitisation programmes. Even then, though, there is a second aspect that is largely untouched, which is the value of the outputs (impacts) themselves. If an assessment is made of the likelihood of an outcome, a second assessment of the likely *value* (utility in the economic sense) of that outcome is also, ideally, required. Because over the longer term many things can become more or less important to a museum, uncertainty over the future value of outputs can be high. For instance, if a museum changes its priorities towards a new audience profile, the continued popularity of a given resource may be less important to it despite its output appearing unchanged. The likelihood of this happening may be hard to assess, but is nevertheless a genuine risk to further investment.[112]

Every behaviour can be thought of as a decision in action, and we have looked at some aspects of these decisions. In Chapter 2 we considered some specific

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[112] Beach and Connolly (2005) talk of objective expected value (the genuine likelihood of a certain level of output), its subjective equivalent (as assessed by a human), and objective expected utility (the genuine likelihood of a certain level of value put upon that output) and its subjective equivalent.

aspects of the context within which UK museums are situated that influence their behaviours around the digital products they invest in, but it is helpful also to have a more generic framework for analysing aspects of the environment as they pertain to governing behaviour. In this thesis we will borrow one such device from the field of theoretical law: Lessig's *modalities of regulation*.

Lawrence Lessig is a lawyer very well known in digital culture for his contribution in setting up the Creative Commons (mentioned in Chapter 2) as well as, more recently, for activism around political funding and transparency, but for this study his earlier work in theoretical aspects of law is especially relevant. In 1998 he drew together a suite of ideas he termed the "New Chicago School" (Lessig, 1998),[113] which considered the regulation of behaviour by four types of constraint – which he termed "modalities of regulation" – that guide, limit, or prompt what an individual might otherwise do.[114] One such modality is the law, the others social norms,[115] the market (acting through the price mechanism) and "architecture" (see Figure 5). By architecture Lessig means "the

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[113] It is possible to trace connections between this paper, written a few years into the internet revolution, and aspects of Lessig's later digital-related work (such as the Creative Commons), which might be read as an effort to use one constraint to indirectly transform another. Indeed he spends some time discussing the then-current debate over the nature of cyberspace and its regulation (Lessig, 1998, pp. 675–676).

[114] Lessig does not claim that the ideas in the paper are his alone, and indeed indicates that the "modalities of regulation" are common currency in certain fields (if not always under these labels). He aims, however, to bring together ideas from various scholars (especially those at Chicago), and thus revise the approach of the "Old Chicago School" he characterises as being small-statist. The New School, he suggests, differs in striving to reveal the connections between legal regulation and other modalities of constraint, and thus its continued importance.

[115] One of Lessig's important points is that norms operate through socially constructed meaning; that is, it is not the act but the meaning of the act that is important. We are therefore talking about costs (and benefits), albeit non-financial ones: 'The regulatory effect of norms comes [...] from something interpretive. The cost [...] of deviating from a social norm is not constituted by the mere deviation from a certain behavior; it is a cost in part constituted by the meaning of deviating from a certain behavior. That meaning is a price, associated with a given action; but one only understands that price by interpreting the action consistent with a norm, or the action deviating from this norm, in its context [...] to understand this constraint, we must speak of "social meaning." [Lessig 1998, pp. 680–681].

world as I find it": the reality within which we operate and are not in a position to change at will. Examples might include gravity, the geography of a town, the global political order, or the (literal) architecture of buildings. Any and all modalities will apply at various times and degrees to an individual. All sorts of constraints can change, although some seem more likely to be stable than others. Some of the ways that gravity constrains behaviour have been changed by the advent of powered flight, lifts and parachutes, but the law itself remains important. A constraint can operate in a different modality for different actors in different contexts – perhaps a law for one is merely a normative guideline for another and irrelevant to a third – and they may be converted to a different modality; for example, over time a law may be widely internalised and operate as a norm; equally a normative behaviour may become codified as law and act more universally. Finally, constraints can act indirectly, via other constraints (this is crucial for Lessig's central argument, see footnote 114). Lessig offers an example whereby a government (acting as law) works to reduce barriers to disabled people in daily life through a combination of subsidising employment (a market constraint), education (modifying social norms) and by regulating the building codes to make buildings more accessible (law regulating architecture) (Lessig, 1998, pp. 668-9).
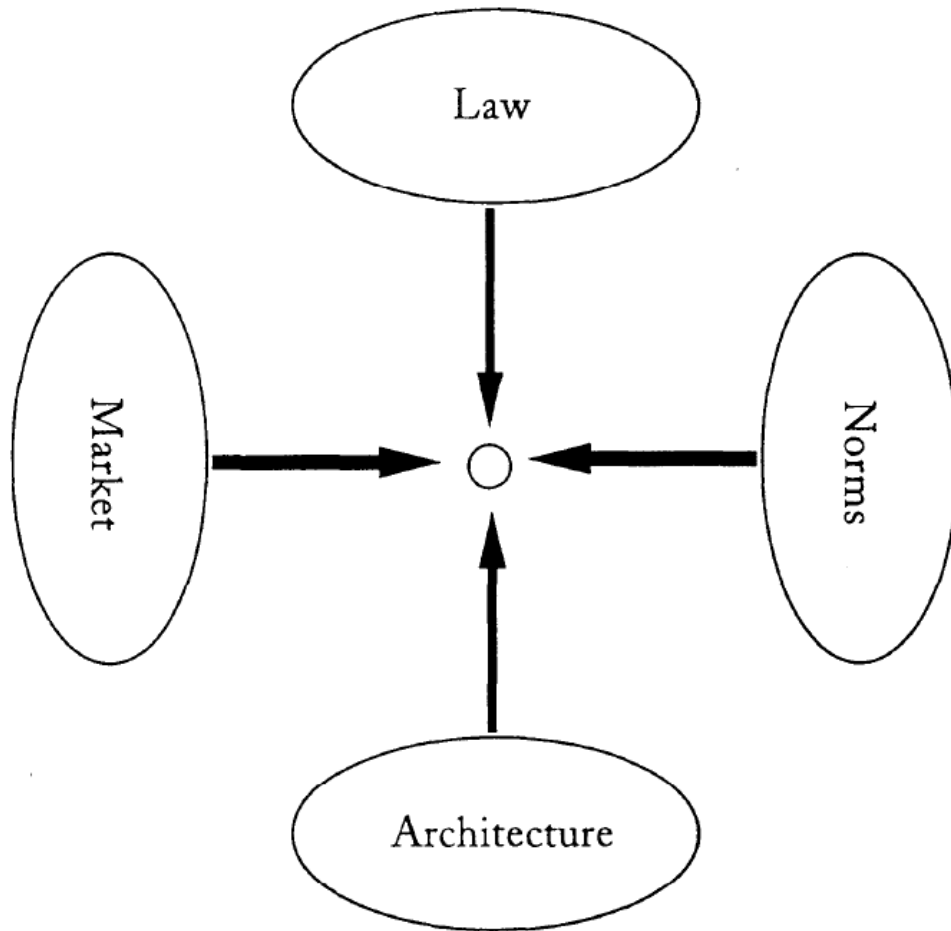
Figure 5: Modalities of regulation constraining behaviour. *From Figure 1 of Lessig (1998)*

Lessig notes that the four modalities he discusses are not the only forms of

constraint on behaviour. One other is, of course, an individual's own will or

desires, and those desires in themselves (subjective as they are) can reflect other

constraints as they become internalised. By becoming integrated with the

individual's subjective will, internalised constraints may act more powerfully on

an actor's behaviour than those that remain external. Lessig also points to a

distinction between objective constraints (that actually operate as constraints)

and subjective constraints (that are recognised by the individual as such). A

constraint may be either or both of these, but if an objective constraint is not also

subjective then individuals may ignore it in making their choices (for instance by

failing to recognise a negative consequence of their action, e.g. through being unaware of a law). Equally, behaviour may be strongly regulated by purely subjective – perhaps imaginary – constraints (Lessig offers horoscopes as an example).[116]

The modalities of regulatory constraint that Lessig offers, and the idea of behaviour being both stimulated and limited by such constraints, provide us with an abstract and generic way of approaching the factors we may encounter in our case studies, and let us break away from thinking only about the concrete things that museum digital products need in order to be created or sustained, or that can cause them harm. Instead they enable us to categorise them by to the strength of the limitations they place on behaviour and the likelihood that an organisation may influence them. Significantly, they help us think about possible trajectories of change, where constraints might shift in their modality and effect.[117] As such they will be a useful framework to have in mind when we enter the case studies.

THE SUSTAINABILITY DYNAMIC: A MODEL

These discussions (on *value*, *resources* and *decision-making*) leave us with the outline of a dynamic that one can hold up against the experience of real-world projects, both for use as a framework for analysing what we observe, and to test

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[116] Interestingly, Barnard, observing that all organisations are only partial systems, consequently also placed much emphasis on the environment in which an organisation is situated. Its relationships with the larger system, he argued, meant that an organisation's effective environment in fact depended upon the goals of the organisation. (Barnard, 1938/1968; Scott, 1990).

[117] Lessig details two other properties of constraints: the immediacy of their effect (compare for instance that of gravity and that of a law, which if broken may have no consequence for some period, and is also mediated by another agent); and plasticity, that is the ease with which a constraint may be changed, by whom (e.g. an individual or a community)(pp. 679-680).

its explanatory power as a model. Secondarily, the same framework might be used during forward planning for new or existing digital resources.

How would this dynamic be summed up? Collins uses a flywheel as his metaphor of choice, with the value created by an enterprise feeding back into the resources needed to sustain it and indeed grow it, so that it can progressively gain momentum (Collins, 2005). Collins emphasises the role of brand-building in his model, and places his "hedgehog concept" at the heart of it, but expressed more straightforwardly the flywheel states that a strong value proposition builds strong support from stakeholders, from which resources are generated anew. Figure 6 shows a simplified version of his flywheel model.
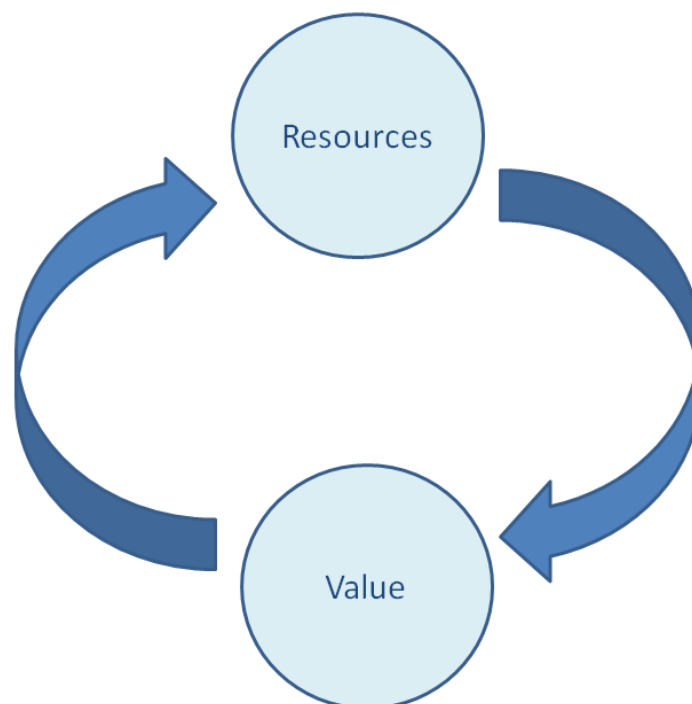
Figure 6: the flywheel model. *Adapted from Collins (2005).*

A loss of momentum would indicate that insufficient resources were being generated – in other words, an unsustainable situation. Collins' flywheel

metaphor well captures the interdependence of resources and value in a social enterprise (and, significantly, stresses the importance of perceived value and brand), but it does not quite represent the role of decisions, which we consider to be critical to the process and, potentially, an area in which improvements of various sorts may often be possible. A decision itself, as we have described it, is the result of a process in which options are identified and evaluated against desired and expected outcomes – actions and costs against consequences and value – and it should sit naturally between the two, like the pivot in a pair of scales. But even without considering the decisions made by external stakeholders and markets, we have identified at least four categories of decision (around value, resource allocation, lifecycle and implementation) that a museum will face whilst building and supporting their digital products, and consequently neither a flywheel nor a single set of scales offers a complete enough analogy for the dynamic.

We offer instead therefore a small variation on this feedback relationship, a cyclic dynamic in which value, resources, and the product itself are aspects of every decision (Figure 7).
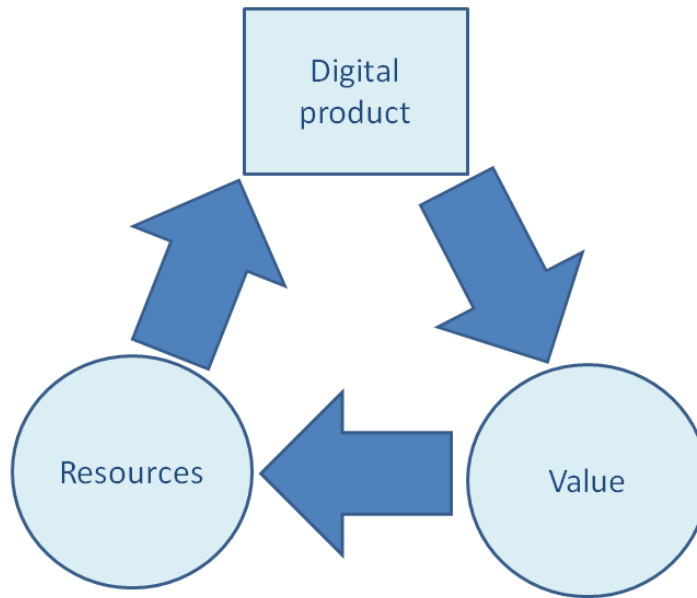
Figure 7: The sustainability dynamic

Here the product is given its own place in the cycle because it is the medium through which resources generates value, and because decisions sit between them all. The arrows represent decisions and the processes or impacts they govern. The product generates value, and this is affected by decisions such as user-centred product design, or choices about which market it serves. Value, it is hoped, drives resources, for instance by persuading audiences to contribute their content or funders to continue their funding, and at this point many of the relevant decisions may lie outside the bounds of the museum that owns the product (depending upon where the resources lie). And finally, resources are transformed into a product, via decisions such as how it will be built and how resources will be allocated within the project. Each decision has own such cycle, wherein resources feed into the product, which creates value and potentially generates further resources. Individual decisions may not operate over the

whole cycle but connect with others, and one can envisage these myriad partial

or complete circles in compound form: a stack of choices between options

intended to produce maximum overall value over a given period (even if this is

not always well defined). As long as the circle is complete when the whole stack

is taken together, it will perpetuate itself, but if one part of this aggregated circle

thins out too much the others will start to fail too, at which point the product

may slip into terminal decline. Flows of value and resources may be unexpected:

an arrow might flow back towards resources if, for instance, product raised

revenue or produced efficiency savings (which sometimes happens even if it

means compromising the value proposition). This is another reason why a

simple flywheel lacks the nuance needed for the purpose of this study, and where

the flexibility of the cycle dynamic is helpful.

3.1.6 USING THE MODEL

This model of the dynamic through which products are built and supported is

simple and, we would suggest, self-evident as a way of conceiving of

sustainability in the sense of a value-centric enterprise justifying its own

support. It will not be tested, as such, in this thesis. Instead the relationship is

used in our case studies and we will be able to examine its adequacy for

explaining what we observe, and thereby to identify areas where further

explanation is required: perhaps where the value proposition and resourcing do

not appear to match up and something unexpected may have affected decision-

making, or where we recognise that there must be some unacknowledged

external influence upon a stakeholder's perception of value or cost. The cycle

may also assist in planning new digital resources by helping us to identify areas

where there might be underperformance or that could be vulnerable to poor decision-making due to, for instance, poor measurement.

<div align="center">*</div>

Chapter 1 posed the question, what affects the sustainability of the public-serving digital products in museums? A preliminary response to this – a working assumption of the thesis – is that products that are valuable enough should be able to generate the resources they require to continue being valuable. The current chapter explored the meaning of value and resources in depth and placed them in relation to the problem posed in this thesis. It then examined the nature of decision-making and in particular its role in the production of value through the building and sustaining of digital products. A preliminary model was constructed that laid out a cyclic relationship between the product, the resources (inputs) it requires and value (outputs) it generates, and the place taken by decision-making. When in a sustainable state, outputs from the product would feed back into more inputs. Putting this model together with the environmental context surveyed in Chapter 2 equips us now to turn to two case studies, where we shall see whether the model can help in understanding them from a historical perspective, but also provide a test of the robustness of the model to see if it is complete in itself.

4   THE CIIM AT THE MUSEUM OF LONDON

> *Sustainability is not for me a technical thing necessarily, it's an information thing…[The CIIM is] already changing the way that we do things, it's really embedded in people's consciousness now.*
>
> Claire Sussums, Head of Information Resources, Museum of London

INTRODUCTION

The Collections Information Integration Module (CIIM) was built for the Museum of London (MoL) in 2009-10 to support the delivery of collections-related content to multiple platforms and environments. It was delivered as part of the "Capital City"[118] programme that created the new Galleries Of Modern London, a £20 million redevelopment of half of the Museum's gallery space which opened in May 2010. The CIIM was not a complete solution in itself, however, but was intimately linked to a new information strategy and revised data management practices at one end, and to public user interfaces at the other. It was designed to fill a gap between traditional collections management systems and content management systems and was in essence a response to the sustainability challenge that faces museums in trying to offer well-targeted experiences whilst reusing as much as possible of their investment in content creation. It faced sustainability challenges of its own, which both reflected and were partially

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[118] "Capital City" was both the name of the overarching project to redevelop the galleries, and the interim label used to refer to the new galleries themselves. These were eventually named the Galleries of Modern London, but the quotations reflect the fact that the interviewees often used the "Capital City" to refer to the galleries, as well as the project.

answered by the role it played in supporting user-facing systems that would actually deliver value.

The genesis and early history of the CIIM bring several issues into focus for this thesis, testing our model of sustainability. We see in particular a clear example of a case being built and a choice being made between immediate and long term goals; and of the challenge of attempting to deliver these objectives in the face of changing internal resources. In some respects this is a simpler case study than that which follows in Chapter 5: it took place in a single, mid-sized museum, involved no partners (although the key supplier was a close collaborator) and had relatively straight-forward funding arrangements. The structure of the decision-making process as well as the sources of value reflect this comparative simplicity, but project had considerable challenges of its own. The Museum of London was in the midst of an organisational restructuring throughout the period of the project and also experienced the shrinking of its web team, whilst at the same time much of its attention was devoted to the creation of the new galleries.

Delivery of the CIIM was attached to the physical rebuilding programme but ultimately it evolved to serve needs far beyond that. The result was that, in the words of Cathy Ross, the Director of Collections and Learning, the museum only woke up to the "cuckoo in the nest" after it was completed and started to affect working practices and the way that staff thought about digitisation projects. Owing largely to the fact that its ownership lay with the Information Resources department, it was a project that was as much about information management and workflow as it was about delivering websites; in commerce terms, the final

system concerned the whole "vertical market" of collections information, from pre-acquisition through data curation to contextual enhancement and multi-platform publishing. Finally, another unique aspect of this case study is that the author was embedded within the CIIM project as the technical lead. This offered a unique opportunity to understand the context and process.

The concept of the CIIM evolved within the context of a larger project – Collections Online – which included delivery to the galleries, and that larger aim must be borne in mind throughout this discussion. Nevertheless the CIIM had a distinct enough objective of its own to make it a suitable subject for examination. Its significance to the current study lies mainly in understanding how a product comes to be built, with the implicit assumption that it will be of use for some time hence, and how its future utility is understood and woven into its realised state.

Our main focus, then, is on the planning and build phases, at which stage the foundations for sustainability are laid. The system went live in a public environment in May 2010 so analysis of the sustainability of the finished product is limited to the time-span between then and mid-2012. However we will review those developments that have happened in the interim and how stakeholders view the CIIM's future now that they have seen it in operation and its influence has started to be felt through the wider organisation.

4.1.1 INFORMATION SOURCES

This chapter draws on interviews and the archives of the project, and excerpts of these are embedded in all the following sections. The archives are extensive, and include the following: minutes of dozens of meetings within the project team,

between the museum and contractors; project proposal and initiation documents; invitations to tender and contracts; MoL's policies and strategies on information management, IT and web development; organisation charts; and a selection of discussion documents and reports written by the project team for internal use, or written by consultants engaged to advise on the scope of the Collections Online project and the technical viability of the CIIM. Together these documents evidence the evolving ideas and priorities of the institution and project's participants, and the parallel formal process of reaching decisions.

In-depth interviews with two key figures (Sussums, 2010; Ross, 2010) enrich our picture of the priorities of the stakeholders and the formal and informal aspects of decision-making. Claire Sussums is the Head of Information Resources and was responsible for the whole "Collections Online" project of which the CIIM was part. The other interviewee, Cathy Ross, started in the role of senior curator for Capital City and took overall responsibility following the departure of the Director of Public Programmes in 2008, overseeing the evolution of Collections Online into an infrastructure project rather than another siloed 'microsite'. A reshuffle of the directorates led to her appointment as Director of Collections and Learning near the end of the project. Finally, two individuals with key relationships to the CIIM provided a brief update on its status in late 2012.

This chapter first describes the CIIM and explains what it was created to achieve, placed within the historical context of the museum. We then consider the elements of the sustainability model, looking first at how MoL sought value initially and as its ideas subsequently developed, and then focusing upon the resources available to the project, their adequacy for the museum's ambitions for

both build and on-going sustainability, and what happened when additional resources were sought. Finally we look at the process of evaluating these elements and deciding on what is to be built, how, and with what preparation for the future. At the end of the chapter we assess how 'fit for the future' the CIIM is, and ask how well value, resources and decision-making explain this fitness, and what explanatory gaps there may be.

In terms of our model, this chapter in particular helps us examine how sustainability figures in the planning and building of a resource, as opposed to the part it plays after the completion of a project. It provides a detailed view of that planning and building process and the ways in which decisions are arrived at when there is little track record upon which to depend and few equivalent systems available for comparison.

BRIEF DESCRIPTION OF THE CIIM

A common problem with delivering collections content to the web is that different contexts or audiences merit different versions of the content, for example different names, descriptions or images; or similar content needs to be accessible through different interfaces or mechanisms. As Head of Information Resources Claire Sussums remarked, 'We were going through loads of different loops in order to get essentially the same data slightly tweaked for different products' (Sussums, 2010). Different contexts might include virtual exhibitions, time-lines, gallery kiosks, teaching resources, mobile tours, or even printed material, each having their own target audiences and requirements in terms of the metadata attached to and surrounding the content. The CIIM addresses this whilst keeping all versions of content attached to a core record. It also lets

administrators group object and authority records arbitrarily, in nested hierarchies which form the context; and to supplement these groupings and structures with content and media in what amounts to a simple content management system. Current collections management systems vary in which of these requirements they can fulfil but to the knowledge of the MoL team at the time there were none capable of all of them.

From a technical point of view, the system has several layers (see Figure 8) arranged in a loosely-coupled way. A Solr index is the workhorse of the front-end, as it is in an increasing number of systems for delivering museum collections to the web.[119]

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[119] Notable examples at the time of writing in 2011 include Black Country History (a consortium of museums in the Midlands), Europeana, and the Culture Grid (run by the UK's Collections Trust).
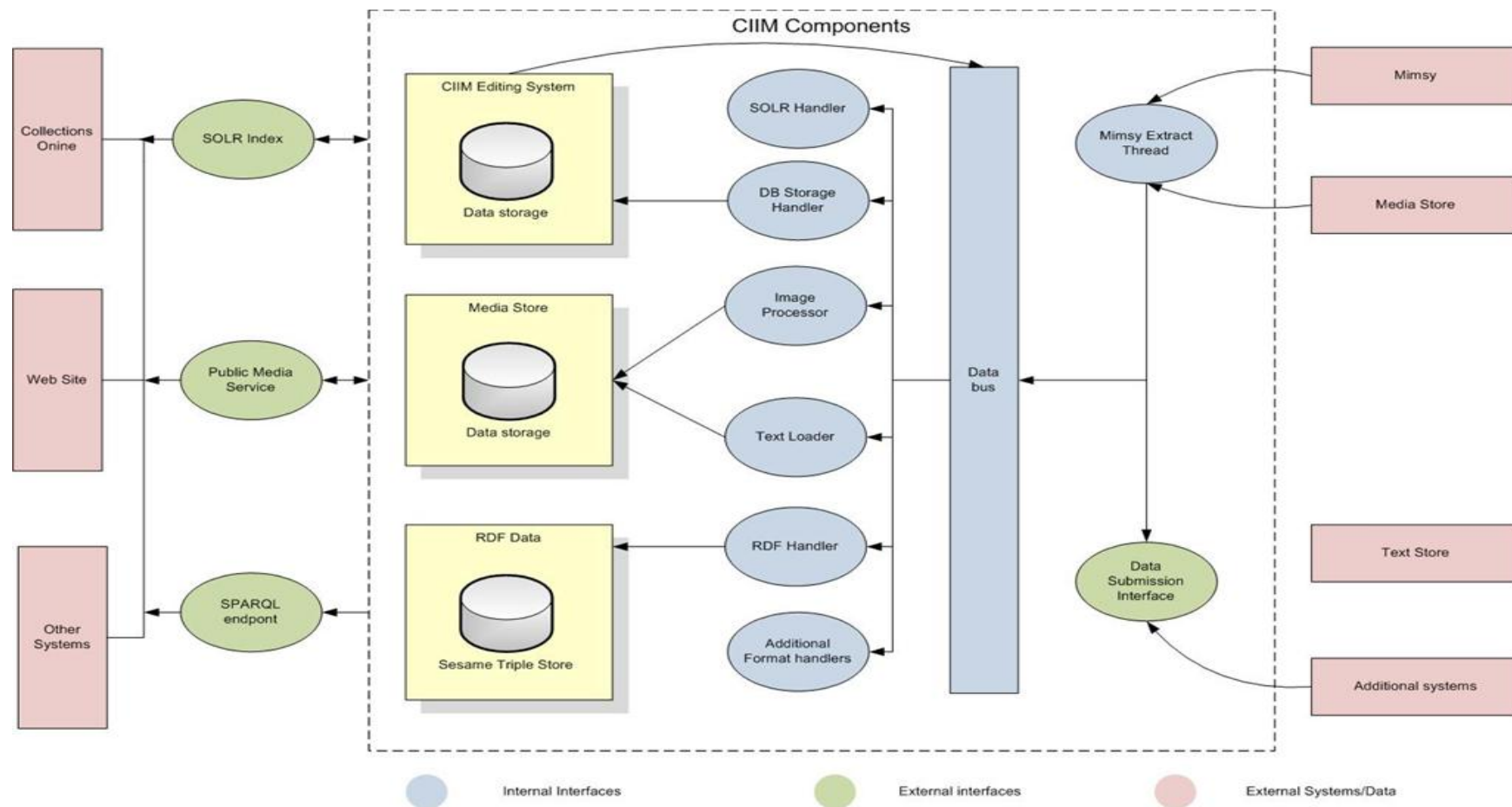
Figure 8 Diagram showing the flow of data and content through the CIIM. The flow is from sources on the right, through extraction and manipulation processes in blue, into data stores for managing the data in yellow and via indexes and other services (green) upon which user interfaces are built (in pink on the left). *Taken from Knowledge Integration, 2010.*

The system was built by Knowledge Integration (K-Int), a small software company with a history of working on cultural heritage data applications since the 1990s which had recently included both the MoL-led "Exploring 20th Century London" and Collections Trust's Culture Grid. The first phase, built between October 2009 and April 2010, was capable of supporting the needs of the Galleries of Modern London but not all of the wider ambitions that the CIIM had come to embody (the remaining features were delivered later in 2010). The first public interface – the kiosks in the galleries – went live in May 2010.

4.1.2 HISTORY AND STARTING CONDITIONS

The Museum of London had previously put its collections online through numerous microsites, many being database-driven and others static HTML. The LAARC site,[120] launched in early 2002, was the first sophisticated example and combined collections data extracted from both MIMSY (MoL's collections management system[121]) and the database of the archaeological archive. Several applications for combined gallery and web use followed between 2002 and 2009, tied to physical exhibitions, as well as some for HLF-funded digitisation projects that had no physical counterpart. In each case, collections data was extracted from MIMSY into an intermediate database. Object and authority records normally had metadata and media added into MIMSY specifically for that project, on top of which was overlain additional content either for extended object descriptions (as in web applications for the Medieval Gallery and for the "London's Burning" temporary exhibition) or to describe the cases, gallery

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[120] See: http://www.museumoflondonarchaeology.org.uk/laarc/catalogue/

[121] MoL used Multi MIMSY 2000 until it was replaced by MIMSY XG, in late 2007. For simplicity both versions are referred to as MIMSY.

sections, themes or subjects used to group the records (for the "London Before London" prehistoric gallery, the online-only projects "Reassessing What We Collect" and "Exploring 20th Century London", the "Pepys' London" exhibition and others). These were held in a database or the CMS underlying the websites. By 2009 around 60,000 object records were online as well as large quantities of bulk archaeological finds. A variety of other uses were also made of digitised objects on the websites, such as in picture banks or teaching resources.

Although the websites built after LAARC drew off shared databases and a partially shared code-base, they were by nature not suited to reuse. The data structure could vary considerably between projects, even when they were held in the same database. Although it would have been possible to combine all of the records into a single search mechanism, the result would have been patchy and inconsistent, with descriptions often tailored for particular contexts. For the museum to shift to having the bulk of its collections online a new approach was called for, including changes to documentation standards and practice, data and copyright policy, and technology. This need was recognised by the Systems Team and the Information Resources department by the time the Capital City project emerged, and it consequently informed the Collections Online project.

In 2002 a new director, Jack Lohman, started at the museum, leading to a re-examination of the objectives of the Museum of London Group (consisting of MoL itself, its archaeology service and archives, and the then-Museum in Docklands). In the same year MoL took the lead role in the London Museums Hub.[122] These

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[122] "Hubs" were an aspect of the *Renaissance in the Regions* programme discussed in Chapter 2. Their objective was to raise standards on a regional basis by facilitating partnerships and co-ordinating activities, developing examples of "best practice", and providing training and strategic

two events had a notable impact on the museum's strategic direction. The Annual Review of 2003–4 includes a section entitled "Looking to the Future", which explains the priorities the museum had chosen and the broad shape of Lohman's vision for the years ahead, including the development of digital resources and the broadening of access to collections, and it describes the need and ambition for redeveloping the lower galleries:

> Major funding is required to display the story of London's histories, heritages and cultures to the present day, to improve the delivery of information resources, especially information about the collection in electronic format, and to enhance visitor services [...] The facility is now almost 30 years old and is becoming worn out. (Museum of London, 2004b)

MoL's displays at that time stopped at World War 1, leading Lohman to write in the Strategic Plan for 2004-2007 "many exhibitions are out of date and need reconsideration". He went on to describe his vision of "complete[ing] the story of London by creating new galleries that feature London in the 20th and 21st centuries" (Museum of London, 2004a). The ambition as outlined in that document was to complete the galleries of 20th and 21st Century London by 2007, although this was later revised. Planning for the new galleries had already started in 2003-4, and in 2005 MoL was awarded a grant by the HLF (see Chapter 2) towards the Capital City project (Museum of London, 2005).

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support. Several significant projects in which MoL was involved were Hub-funded, including Exploring 20th Century London, and policy and training work to raise the standard of record and information management, both of which had at least an indirect influence upon the Collections Online project.

This, then, was the context within which Collections Online was initiated: a major capital programme designed to shape the Museum of London to this vision; a drive to broaden access; and a leadership role within London's museums. Together with almost a decade of putting digital collections online, these provided the framework for value, resourcing and the decision-making process. We will now look in turn at these elements and how they played their part in the project that led ultimately to the CIIM that launched in 2010.

VALUE

The purpose of the CIIM – the source of its value to the Museum of London – was complex and evolved throughout the project and beyond. In fact the value it enabled was always expected to arise from the digital resources built on top of it, rather than directly from the CIIM itself, making it still more problematic to predict. It can also be hard to disentangle value from the other aspects of the process: the resourcing and the decision-making itself (see section 3.2.3). Nevertheless, the creation of value is assumed to be the motivation of such a project, and the whole point of any effort at sustaining its output, and in this section we examine how ideas of purpose and value developed through the process that resulted in the CIIM.

The proposal that received HLF approval and on which funding was based included plans for an "information zone" in the Sackler Hall,[123] as well as for an e-learning studio, within a projected total budget of £18m (ultimately £20m was spent). Further developed through 2006, the plans required a minimum number

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[123] The Sackler Hall is a multi-purpose open space at the end of the new galleries which includes relaxed seating, a cafe and a large digital art installation as well as the terminals on which visitors can access collections information.

of objects to be displayed in the new galleries as well as being accessible through other means. Sussums (2010) explained: "it started actually out of the need to deliver information in gallery and the concept of that as an information zone, before it mutated into a café with some terminals, and the recognition that the museum didn't have an infrastructure that could deliver that at that point," whilst Ross added "It was very much part of the Capital City programme ... it was going to be a little microsite going with the Galleries of Modern London" (Ross, 2010).

As well as the information zone, which would include terminals that let users explore all of MoL's digitised collections (whether or not they were in the galleries), there was a plan for terminals throughout the new galleries giving access to databases that focused on a theme specific to that section. Interestingly, it was constraints arising from the physical architecture of the gallery that resulted in these terminals being dropped and more attention turning to the information zone's role: "Design said 'actually, look, there's going to be no room for these things'. We had such problems with trying to fit everything in" (Ross, 2010).

This in turn led to a larger change of objectives, which by 2008 emerged as a significantly different plan. However, although the gallery layout was a factor in redefining the Collections Online project, it was not the only one, and the other motivations for change had a consequential cost implication. Ross remarked that "Claire has the credit for saying, 'hold on, we don't want another microsite' [...] We wanted to do it properly, [so] then there was a budget implication because it needed the technical side" (Ross, 2010).

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The sentiment against "microsites" reflected Sussums' experience as Head of Information Resources and the wish to avoid multiple data models and the use of MIMSY to hold content intended purely for driving websites, especially navigation. Here was a chance to build a mechanism that could support any number of front-end use-cases and relieve the collections management system of an inappropriate task. Sussums had in mind particularly the approach taken by Tate, an organisation where she had previously worked, and explained "they had a mechanism that allowed [them] to capitalise on other processes that they were already doing from a collections management point of view, to make the gap between acquisition and the web much shorter". This included a "text loader" which would automatically ingest discursive text from word-processing files and associate it with documentation about artworks that was extracted from their collections management systems, for subsequent use on gallery terminals.

Whilst Collections Online was under way, Sussums was simultaneously closely involved with the London Museum Hub's Information Policy project and implemented the resulting framework within MoL. This high-level perspective over the museum's complete information management needs helped to ensure that the project considered the broader role of collections information beyond serving a small number of user interfaces.

Discussions amongst a core team had in fact already seen the germ of an idea develop in 2007-8. The team had been assembled by Sussums and consisted of herself together with a documentation officer, project manager, and two systems/web developers. Their early discussions were reflected in a proposed

vision offered to a stakeholders workshop in June of '08 (Berwyn Consulting, 2008a):

> The Museum of London wishes to improve and extend the ways in which users can access its collections online.
>
> Specifically the Museum wishes to:
>
> - Provide searching capability across all or any specified part(s) of the collections
>
> - Provide a delivery strategy that enables access to quality data in such a way as to maximise use and re-use in a variety of different contexts.
>
> - Provide an environment which positions delivery of collections online as part of normal core activity.
>
> The Online Collections Delivery Strategy will provide a coordinated technical and documentary framework to support these aims.

This workshop, facilitated by an external consultant, included both internal stakeholders and "sympathetic outsiders" from the British Museum, the National Gallery and the London Museums Hub. Much discussion centred on the web presence of the museum's collections rather than the gallery uses, as well as the importance of flexibility, reusability and contextualisation. The resulting report (Berwyn Consulting, 2008b) contained a wide-ranging set of functional requirements and principles for the system, but also a set of issues that were pertinent to the overall Online Collections Delivery Strategy but which were not

requirements of the system. These were of great relevance for the strategic positioning of the system and for its long-term sustainability (see section 4.5). However they also included a variety of sources of value that would be available to an appropriately designed and managed system, and that would be intrinsic to its long-term success. In particular, the express desire for the creation of high quality records to become an on-going activity implied the need for the system to support an efficient workflow. Other sources of value – such as user-generated content – could only be fully realised once suitable policies and safeguards were in place.

4.1.3 CORE AND SURPLUS VALUE

Putting together the ideas of the project's core team and the recommendations from the stakeholder meeting, it is apparent that a critical aspect of what came to be known as the CIIM was that it would be required specifically to address and enhance the sustainability of other products and activities and to provide a single, powerful and efficient core to drive them all. As indicated by several of the intended end results listed in the project proposal document (PPD – see section 4.3.2), much of the CIIM's value would depend upon what was built upon it (as well as upon the other two strands of the overall project: the digitisation work, and the Sackler Hall user interface). The chief value of the system was consequently expected to be transmitted through what it thus enabled, adding to the complexity of accounting for it.

In order justify its creation and to be sustainable itself the CIIM needed at the minimum to support the known requirements of the planned products to be built upon it *and* to be extensible enough to serve as-yet-unknown requirements of

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future products. That would constitute the core value of the system. "Surplus" value beyond this minimum could arise if the CIIM enabled these products and processes to happen more efficiently, effectively or sustainably than would otherwise happen if each happened in isolation.

This "surplus value" was the real justification for the CIIM, and it would arise through various means, the first being through improvements to working practices in terms of efficiency and quality. If the CIIM fitted comfortably and efficiently into the workflow of its users (MoL staff) it would improve the flow of content between data sources and end-user applications, and "allow us to deliver collections on-line as a by-product of other Museum work e.g. acquisition" (Museum of London, 2008a). Secondly, the CIIM would facilitate the reuse of information.[124] By keeping structured metadata and contextualising content together, it would become easier to repurpose and reuse it in new environments, reducing costs. The CIIM also enabled increased flexibility and permitted more speedy reaction to new opportunities. Fewer opportunities missed would mean greater value realised, and resources would also be freed up to accomplish more elsewhere. As the PPD notes (*ibid*.):

> By saving the time currently expended on specifying and running new project based sites, resource will be freed up to focus on creating other types of web products.

Lastly, improved search indexes and collections "knowledge" could be built upon the mass of knowledge accumulating around records as related information

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[124] Like the first point, this can alternatively be seen as reducing the resource requirements for other activities.

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sources were concentrated into one place. This would enhance the user experience and the potential applications of the data internally and externally.

4.1.4 SETTLING ON THE VALUE PROPOSITION

This complex of valuable opportunities, some with immediate pay-offs for the Capital City gallery project and some based on indirect benefits that should accrue over the long term if the system was built with sufficient flexibility, were distilled into the PPD that was issued in October 2008. This document encapsulated the objectives that had by then evolved and offered the project board a newly refined value proposition for approval.

The PPD (Museum of London, 2008a) describes the following key end results of the Collections Online project:

1. information on the gallery objects, and the 'digital databases' from a single point of access for staff (leads to improved efficiency when updated collections information);

2. one point of access for collections information online for users;

3. enhanced experience for our web users;

4. agreed and tested structure for collections information online in place for future expansion;

5. improved efficiency of related working practices, e.g. acquisitions procedure linked to web publication.

Although the value proposition evolved somewhat through the build phase, this proposal was the basis upon which the project board made their decision.

We see here, then, how the organisation used the immediate and relatively narrow requirements of one project as an opportunity to make it easier to generate value in future projects, and to support the sustainability of collections digitisation as a whole. It did this by rethinking the relationship between internal working practices and the delivery of content to the public. Such an end-to-end overhaul was seen as having clear value for MoL, but it also had a greater cost than the more limited original ambition, and it is to the question of cost that we now turn.

RESOURCES AND OTHER CONSTRAINTS

Resource constraints take many forms, and those operating upon what became the CIIM also changed markedly over the period from its inception (as the technical means to deliver collections content to the galleries) to its delivery as a multi-purpose middleware solution. Some changes resulted from the responses of the project board to the modifications to objectives described above, and others were the result of conditions external to the project itself. Non-resource constraints were significant, too. The report from the June 2008 stakeholder workshop (Berwyn Consulting, 2008b) noted certain gaps in policies and standards that might restrict the value that could be realised from the product, and these gaps are discussed later in this chapter. However these did not so much constrain *how* the product would be built, rather *why*, as they compromised value.

Financial resources are one of the most obvious considerations in most projects. For MoL, funding for digital media had taken a commonly-found pattern of a moderate amount of core funding for web staff together with project-based

funding for non-core work and in particular for digitisation, for which it had received substantial funds over the preceding decade:

> [W]e've been very successful at getting pockets of money for digitisation, but this was such an infrastructure project that I'm not sure how we would have funded that through external funds we were previously successful with because those were much more about digitisation. (Sussums, 2010)

The funding for the CIIM did, in a sense, come in part from an external funder - the HLF put in large sums to enable the Capital City project as a whole, and digital collections were promised as part of the funding agreement. Nevertheless, the CIIM was built not merely to support a collections access system in the galleries, but intended as a piece of infrastructure that would yield benefits over the course of many future projects; and as a consequence it required commitment from the museum itself to fully resource it fully.

The museum recognised, however, that a period of relatively abundant funding for digitisation was coming to an end; and that, for it to continue to its digitisation activities, it must build them into improved and rationalised workflows. This worked to the advantage of the project:

> Our timing was completely right because it was at the point where everyone was saying, "external funding for digitisation is gone, so you've got to find other ways to do this"; and [there was also] the recognition that the size of our collection meant that we had to find a different way to approach it. So then my "I want to capitalise on other information

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processes" [...] was a better argument [...] because people started to realise that we weren't going to be able to get additional funding going forward. (Sussums, 2010)

The total budget proposed in the PPD was initially £60,000. However this was to cover three strands of work, outlined in the PPD (Museum of London, 2008a):

1. Digitisation of content: the creation of images and electronic information about our objects and associated subjects and themes.
2. Web delivery mechanism: the creation of the technical infrastructure and web interface for making the collections available online
3. Sackler Hall information delivery: the delivery of collections related information on the computer terminals and the programming of audio visual content in the Sackler Hall.

The needs of the gallery and web based search/browse interfaces, together with content creation, were the clearly the key objectives, rather than the creation of a mechanism for wider use. Digitisation, however, accounted for but £2000 of the budget (this being for copyright clearance).

However just one month later, in November 2008, the budget attached to the PID was for £115,200 (Museum of London, 2008d). The main difference was the inclusion of £60,000 for creating a repository (as well as a larger contingency and £2000 for a "health check"). The evidence from Ross and Sussums suggests that in, the space of a few weeks, there had been big changes to the structure of the project and the human resources available to it, whilst at the same time the core team were reaching the conclusion that outsourcing was the only viable

approach to developing the "middleware" that had emerged as their preferred solution, as we can see from the archive and from Sussums' statements. In her words, "we just adapted as we went, as the environment and the structure changed we looked and said, 'well how do we fit this in with the moving reorganisation?'" (Sussums, 2010). The answer to this question was to seek more funds, which were ultimately secured.

Later still, archived e-mails indicate that it became apparent to the team that some additional funding would be required in order to deliver their ambitions for the project. As Sussums explained, "there was a point where we re-profiled the budget [in early 2010] when we realised that the design and the integration work were going to cost more than we thought originally as a result of staffing changes. I had to write a case to directors and the project lead for the change" (Sussums, 2010).

Whilst the PID evidences a recognition that building the CIIM itself would need to be outsourced, evidently the plan was still that the web and gallery interfaces built on top of that mechanism would be delivered with internal capacity. However a staffing shortage within MoL (to which we will return shortly) made this untenable and led to the need to outsource the integration work at extra cost.

In terms of human resources, project documentation shows that MoL's key internal capacity for planning and managing the project and for technical work (if necessary) was within the Information Resources department and the Museum Systems Team. Information Resources also provided the capacity for enhancing records. However this capacity was not constant through the course

of the project, and changes to the availability and roles of staff were a particular
challenge for Collections Online, as Sussums (2010) observed:

> Organisations don't have a single state, they're always changing and I
> think you have to adapt to that. But I think we probably did have more
> flux in that project, in terms of infrastructure and also staffing levels than
> I've experienced in other ones; that was pretty tricky.

Planning was originally based upon the museum having two web developers, but
following the departure of one of them in September 2008, her position was left
vacant. The museum's web personnel were at that time part of the Systems Team
and consisted of the web content manager and the remaining developer (the
author). A series of organisational changes followed, further detailed in section
4.5. In the autumn of 2008 the rump web team was moved out of the Systems
Team (renamed simply IT) and put under the direct management of the finance
director. By July 2009 they had been moved into the Communications
department, which was headed by a new recruit to the museum and was newly
formed out of the former press, marketing and web teams. The developer's time
at that point was split between two major projects – as technical lead on
Collections Online, and collaborating with the content manager on planning the
redesign of the main website – as well as day-to-day maintenance of the
museum's web sites and managing a contractor. In the autumn 2009 he was
assigned to the role of project manager for the website project. The end result
was increased competition for diminishing development resources, making it
impractical for MoL to undertake the development work that had previously
been projected to be done in-house.

Once it became clear that in-house capacity was inadequate, the project team was obliged to reconsider how the user interface in the galleries would be implemented. It was therefore a factor in the need for an increase in the budget, as Sussums pointed out:

> What made [the budget] difficult, was obviously the staff turnover ... Where we ended up changing things around quite a bit was obviously with the development and the integration because we originally thought that was going to get done in-house and it didn't.

The Collections Online project had interdependencies with a number of other projects (notably the website redesign) but found itself competing with them for the same human resources. Whilst in principle it is possible to buy in extra capacity, much of the work undertaken in the CIIM project by MoL staff involved planning and decision-making that required deep knowledge of the organisation and the specifics of the problem. Specialised technical work can be similarly inflexible in that learning the specifics of a given technical scenario and understanding the wider framework of needs can take substantial time, and consequently it is not always possible simply to purchase short-term additional development capacity. The minutes of technical meetings in early 2009 show how, faced with this conundrum, the Collections Online technical team identified the areas of work that could be handed out most effectively and made a bid for additional funds to support this approach, which proved successful. Some compromises were made to the technical solution for the user interface in order to make it possible to contract out the development work. Since the gallery interface was to be adapted for use on the web, a decision had been made to

build it ready for integration with the museum's existing content management system (Microsoft CMS 2002). In-house capacity had originally been earmarked for this work because of its close dependency upon the existing codebase. Yet this was recognised as a risk to the project from as early as 2008 (Museum of London, 2008b). Given the staffing situation it was decided that interface development should also be outsourced as far as possible; however, by 2009-10, when user interface development took place, developers familiar with this software were hard to source and the museum therefore elected to compromise and not to require the use of the museum's CMS. They did nevertheless require that the site be built using the same underlying framework (Microsoft .Net 2.0), which would in principle enable it to be retrospectively integrated with the CMS when the opportunity arose. The .Net development work was undertaken by Precedent, the company responsible for the design of the new website and of the Collections Online interface for the new galleries. This choice was again informed by expediency, since the designers could then work most closely with the people implementing the design.

Other personnel changes through the duration of the project had implications both for decision-making and the availability of internal capacity. In the October of 2009 the documentation officer (Alex Bromley) took over as project manager, a role in addition to his responsibility for ensuring that content production continued to the required pace and standards. The IT department, too, was in flux, without a head of department between October 2008 (at which point the web staff had been moved into another department) and June 2009, during which period the Project Board thus lacked an IT representative to contribute to

decisions. Between the appointment of a supplier for the CIIM and the delivery of the public interface for the new galleries there were no further staff changes, and the gallery interactive went live on time. Human resources once more became a critical constraint upon the website redevelopment project (and with it plans for putting Collections Online, online), with the departure of the remaining developer (the author) in May 2010. The web team thereafter consisted of a single permanent member of staff, the web content manager, just at the point that designs for the new website were finalised and ready for implementation. MoL then opted to hire a series of contractors to implement the new templates and to integrate the Collections Online interface with the site, whilst delaying the re-launch by a year until mid-2011.

We can see from this sequence of events that the shortage of in-house human resources obliged the project team to make some challenging decisions, and also tested the readiness of the organisation to support the project. Optimal integration with the CMS was sacrificed in order to be able to distribute the work that could not be handled with existing resources, but MoL's response to this shortage of in-house capacity – in providing the funds necessary for the work to be performed externally – showed the degree to which it was prepared to invest in the short-term objective of delivering content to the new galleries. The mandate of the project team meant that they could only make a strong argument from this short term perspective, and the Executive Committee duly gave its support and provided the additional resources . From a long-term perspective, however, it would have been preferable to use existing resources committed to the web team to fill the vacant developer post that remained empty since mid-

2008. This would have enabled MoL to build with their existing technology and deploy rapidly onto the websites by training the new in-house resource, and it would also expose the museum to less risk of losing the knowledge about the systems it was investing in.

The events of late 2008 and through 2009 also suggest that the volatility of the structure and personnel of the organisation had a noticeable impact upon the decisions that were made, or in some cases not made. A decision on the long-term development capacity was vital to the project but outside its remit, but this decision was deferred throughout 2009-10, and that deficit in strategic decision-making within the Department of Public Programmes meant that the project-based perspective was the only one that could be advocated to MoL's executive committee in order to secure the necessary additional capacity for building the user interface. The technical decisions made by the project team that followed from this can thus be seen as a fall-back response to the failure of other parts of the organisation to make decisions – a disconnect between project and operational planning that appears to follow from the departmental reorganisation and the lack of digital leadership at that time. We cannot definitively say on the available evidence how much the failure to make such decisions was attributable to a shortage of decision-making capacity as opposed to a conscious attempt to defer such decisions; nevertheless we can see how the constraints of a project's remit can be problematic when the organisation is unwilling or unable to commit to supporting longer term objectives.

4.1.5 TECHNICAL CONSTRAINTS

MoL's main platform for servers was Microsoft Windows, and for databases it had the ability to support both Oracle and Microsoft SQL Server. For programming, Microsoft .Net was the core server-side skill, being the framework underlying the museum's content management system. The tender documents bear witness to the fact that the team considered that, although it would be advantageous to use familiar and supported technology, this was of secondary importance to the capabilities of the system overall, as long as it was nevertheless possible to gain those skills and for MoL to manage and further develop the system independently, should they so wish. The invitation to tender (ITT) thus stated "where possible we would prefer to use technology with which we have familiarity, although this will not preclude alternatives where [...] there is a strong rationale and the technology is sufficiently stable and open."

In the event, a solution using a mixture of familiar and unfamiliar technology was agreed upon. The most important technical constraints, then, were the functional requirements and the non-functional technical requirements gathered together in the "Collections Online Information and Technology Strategy" (Museum of London, 2009a) under the principle of "sustainability", such as the ability to develop the codebase independently of a vendor.

Besides the obvious constraints of financial, human resource and technical factors, we have seen how the physical constitution of the gallery affected the requirements for user interfaces and, ultimately, the underlying delivery mechanism. So although software itself occupies little room, space still played a motive role in the project, although in truth it had little to do with the broader

ambitions of the CIIM. The final constraint was the delivery date, which for the initial user-facing front-end was an unchangeable deadline (at least, unchangeable by the Collections Online project) in order for it to be ready in time for the gallery opening. This was itself delayed several times for reasons related to the physical building work, which extended the timeframe available for delivery of the CIIM. By the time MoL put out the ITT in August 2009 the gallery opening was expected to be in May of 2010, so the CIIM had to be delivered to the degree that it would support development of the gallery interactives by mid-January of 2010 (Museum of London, 2009b).

DECISION-MAKING AND THE BUILD PROCESS

A thread of decisions runs through the stages of planning, building and supporting the CIIM; a continuous process of examining the desired outcomes and the estimated costs and negotiating what to invest in, and how. What decisions were required, how they were made and by whom is the subject of this section.

In section 3.2.1 we followed the lead of Freeman, Mitchell and others (Freeman, 1984; Mitchell *et al*, 1997) in characterising stakeholders as agents that affect or are affected by the organisation in achieving its objectives, noting the importance of both the legitimacy of their claim to be stakeholder, and whether or not they are identified as such. A distinction was also drawn between resourcing and non-resourcing stakeholders. Internal stakeholders such as staff, together with funders (depending in part upon their agreements with the museum) are amongst those that may have significant direct influence over key decisions. Other external stakeholders, particularly the museum visitors or audience, may

have great interest in a product or service but little involvement in shaping it. Bishoff and Allen (2004, p. 18) remind us, though, of the importance of the value proposition to stakeholders, reinforcing the fact that by "stake" we mean value, and that the museum's role is to deliver appropriate value to each of these identified groups. Their involvement in decision-making therefore appears crucial.

In the case of the CIIM, the product is a piece of "middleware" intended to deliver content to other applications rather than directly to end-users. Nevertheless the user-facing products that the CIIM was to serve initially (the gallery and web-based Collections Online interfaces) had a public audience in mind, and the requirements of these interfaces fed through to the functional requirements of the underlying CIIM – they were effectively regarded as an audience for the system.

An evaluation strategy for Collections Online was drawn up in consultation with the Head of Learning, Frazer Swift (Museum of London, 2008c). It identified target audiences for the two known delivery channels, based on those devised by consultants for the museum as a whole. These were "experts" and "self-developers" (website and Sackler Hall); and "aficionados" and "learning families" (Sackler Hall only). For the initial requirements gathering (for the gallery or web interfaces) there was no direct consultation with these identified audiences, however the project team were informed by the lessons of the museum's previous experience. Their reference sources included a focus group study conducted by the London Hub (Boyd, 2008), the summative evaluation of the Exploring 20th Century London website (ICT4Learning, 2007a), and formative

evaluation for the Living In Roman London website (ICT4Learning, 2007b). Focus groups and prototype testing provided further feedback. Together these amounted to a set of functional requirements that fed into the CIIM.

No external stakeholders were identified that would use the CIIM directly in its initial state. Consumers of the planned OAI gateway would have a stake in the content, structure and format of the data itself but are essentially uninterested in the underlying software, and although a public developers' API was considered desirable from an early stage (Berwyn Consulting, 2008b), no requirements were actively gathered beyond this and neither the API nor the OAI gateway were released in the first year of the CIIM's operation.

In addition to public end-user audiences, two internal user groups were identified for the CIIM. The first group was responsible for administrative and content creation functions, and their needs were, essentially, the needs of the core CIIM project team, who identified the requirements for administration and content creation and developed these iteratively with K-Int. This user group was consequently represented directly by "influencers" in the decision-making process. The second internal user group was wider. A need was identified for an intranet version of the search interface that any MoL staff member might access to find in-depth collections data. MIMSY's license limitations and complexity were the motivations for this as they previously made it impossible for a visitor assistant, for example, to use the collections management system to answer queries about the collection. There was no specific requirement gathering for this use-case, which would not be delivered immediately in any case,[125] but it

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[125] As of November 2012 this interface has not been built.

was accepted that the most important difference from the gallery interface would be complete coverage of the collections rather than additional functionality.

Stakeholders who directly contributed to decisions, then, were all internal, with the exception of the funders at the HLF whose original decision to substantially fund the overall Capital City project provided the framework for Collections Online. After that point, however, there is no evidence that they were involved with making any decisions on the development of Collections Online. Nevertheless, the funding agreement was clearly a significant motivating factor, as Ross' testimony illustrates. Within MoL, as part of the Director's Capital City plans, the project was owned at the highest level. The Executive Committee contained three key stakeholders in the museum's Director, and the directors responsible for major projects (including Capital City), public programmes (including exhibitions and web) and finance. The Collections Online project manager reported initially to the Collections Online Project Delivery Board (COPDB), which included Ross and Sussums along with two directors and department heads responsible for education, new media and design (Museum of London, 2008d). The COPDB reported to the Capital City Project Delivery Team (CCPDT) which in turn reported to the Executive Committee, but as Ross explained, the COPDB became essentially the same as the CCPDT following upheavals to MoL's organisation and was subsequently subsumed by it.

As previously related, the plans recommended to the various boards and committees were developed by a Collections Online working group consisting of the project owner/QA (CS), project manager, the content lead and technical staff.

This team made operational decisions but strategic and financial decisions were referred up.

4.1.6 BUILDING CONSENSUS

The stakeholder workshop previously mentioned was the first opportunity for building consensus behind an "Online Collections Delivery Strategy" that would deliver "a coordinated and extensible technical and documentation framework" (Berwyn Consulting, 2008b) with a strong emphasis on workflow, improved access and reuse. It made explicit the idea that the deliverable was not simply a kiosk and web user interface but that the underlying mechanism for these would be the underpinning of any number of interfaces.

The workshop was the only major consultation/advocacy work prior to the completion of the mechanism. Combined with the evaluations of other MoL collections sites it informed future discussion. The project team met to tighten up the vision and narrow the scope at the end of August 2008, but at this stage the idea of "derivative" metadata records was still in its infancy. The team then embarked on a process of benchmarking and comparative research, visiting Tate, the National Maritime Museum and the British Museum to understand how each delivers collections to the public interfaces. By late 2008 an outline architecture was proposed by JO, which combined elements of the Tate and Europeana models with MoL's specific requirements, and mooted the possibility of using hosted semantic services such as that offered by Talis.[126]

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[126] It is cautionary to note that Talis' hosted platform has since been scrapped having proven uneconomical for the company to support (Dodds, 2012). A system built around this would have had to be redeveloped at considerable expense.

The novel form of the software that was being discussed led the project team to seek further advice on the wisdom of the approach. In March of 2009 some advice was offered *pro bono* by UKOLN,[127] whose consultant met the team and reviewed the suitability of the overall plans. His report made a number of suggestions on how to structure the tender invitation, in particular distinguishing clearly between the requirements and possible solutions (Walk, 2009). He also raised the importance of organisational "buy-in", pointing out that the project lacked a technical champion at a high level in the organisation owing to the absence at that time of an IT manager. He highlighted the need to clarify business processes and workflows, which were evidently complex and would need to reconcile potentially conflicting needs – data reusability and data integrity, for instance. He also expressed reservations about the suitability of one of the technical options being considered by the team at that point, namely repository software such as DSpace.

The team appears to have been building up to requesting additional funds for a while: a draft project proposal from September 2008 (Museum of London, 2008e) shows that a budget of £15,000 was originally considered adequate for the technical work (although at that point it was also assumed that internal resources could provide the development capacity to deliver the front end). But a month later the infrastructure concept had evidently developed to the point where this was clearly inadequate, and a budget of £60,000 was mooted. With the "health-check" done and UKOLN's advice in hand, the team started to

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[127] UKOLN is a research organisation funded by JISC that acts as 'a centre of excellence in digital information management, providing advice and services to the library, information and cultural heritage communities'.

strengthen and focus this case and prepared to propose a revised project to the CCPDT. In May 2009, Sussums issued a paper explaining to Ross the case for expanding the project to support a wider vision, as Ross explained: "[I was] chief curator of Capital City, so therefore responsible for the delivery of content, as it were. And it was also made I think to Collections Committee". If Sussums needed a champion, as UKOLN's consultant had recommended, it could now be Cathy Ross. Up to that point, Ross remarked, she had seen the project in terms akin to previous microsites, which was reflected in the budget: "it wasn't really budgeted for in the original Capital City budget because the vision... was just another microsite, which we'd just double-up on the content [...] [it was] not a whole technical side" (Ross, 2010).

It was a difficult time to be making the case for more funds. With Capital City in a phase of "value engineering" – that is, looking for areas to cut – it was hard to argue for investing more in a system that was always going to be hard to explain to those outside the documentation and digital areas of the museum. In Ross's words, "as this was an add-on extra anyway people didn't really want to give the go-ahead just in case we'd give the go-ahead to this and we wouldn't have money to do the pleasure gardens or something like that."

Nevertheless the proposal got assent, which Ross attributed in part to the less formal element of decision-making and advocacy: the corridor meetings and coffee breaks that allow bite-size discussion and explanation on a one-to-one basis.

> It went through by luck and chance and catching people on the right day. Sometimes I think that actually that might be the best way to get things

through because [...] if it's not really on people's radar they don't sort of scrutinise and block things because they don't understand [them]. (Ross, 2010)

She admitted too to the importance of repeatedly explaining to decision-makers how digital products can create value:

[the value of software is] one of the things that once you know it, you really, really know it [...] but if you don't know it you just can't quite imagine it unless you have lots and lots of papers like [Sussums' paper]. You have to write it down and you have to lobby and [...] be an advocate the whole time. (Ross, 2010)

Sussums, too, suggested that MoL's history of putting collections online – which informed the paper she wrote – amounted to organisational learning and helped its decision-makers to reach the conclusion that her approach was a worthwhile investment:

organisations tend to make decisions on what they've learnt previously [...] If we hadn't had those previous things happen to us then I think making the case that we made going into getting Collections Online done wouldn't have been as easy to do. (Sussums, 2010)

According to Ross, throughout the summer of 2009 the project was "floundering", owing to the problems with staffing noted previously. Nevertheless, with the CCPDT's approval Collections Online had become an infrastructure project.

4.1.7 POLICIES AND PRIORITIES

The report from the stakeholders' meeting (Berwyn Consulting, 2008b) not only identified various potential sources of value but it brought to attention a number of areas to which MoL needed to pay attention in order to maximise the potential of the Collections Online project, especially relating to prioritisation and to gaps in policy.

The first area concerned the way the museum prioritised its time and resources. Stakeholders strongly stated the need for the museum to resource on-going digitisation, data creation and management, and identified the need for a digitisation policy and data standards. Sustainability was equated with the creation of data as "an on-going core operation of the Museum" – in other words, the participants evaluated the value/cost equation in favour of supporting the activity long-term. Secondly, there were worries about the unknown impact upon workloads of increasing the data available online. This embodied a question of risk: the unknown cost of the work, or alternatively the possible reputational harm of not adequately resourcing the work. The report also pointed to the need for policies and working practices to manage user generated content (UGC). Again, this highlighted both a risk and potential cost, and an opportunity for maximising value and addressing legal constraints. A set of concerns about data quality or completeness, authority and trust were expressed, related less to the capabilities of the system than to the nature of the data released through it. Fuller disclosure of information could yield value by serving the public mandate; on the other hand the museum's authority might be compromised by any data imperfections. The possibility of infringing copyright was another highlighted risk (an unbudgeted cost): "Clearly understood and

applicable policies need to be determined so that concerns over copyright don't delay or divert efforts to make data available online." A further opportunity for value was identified, in the form of the data in existing micro-sites that could be incorporated into the strategy, and participants identified the potential value of making data reusable off-site by third parties. Finally another source of potential value (or in effect reduced cost) was suggested through increasing picture library and other sales. No concern was apparently expressed that content would be abused and lose the museum revenue.

Each item in this list can, once again, be expressed in terms of a potential cost (risk) or potential benefit (opportunity). The risks concern both direct resource costs – the un-quantified workload involved in data creation or in managing UGC – and what might be termed negative benefits; that is, harmful impacts, such as damage to the museum's reputation or copyright infringement. The opportunities emphasise that the stakeholders recognised the potential of infrastructure that would support future digitisation and dissemination activities.

Consultation with stakeholders, then, helped alert the project team to the fact that, in order to control some of the risks and to keep opportunities open, MoL needed to address some policy gaps, in particular around copyright, UGC, and publication standards for data. The latter was addressed by the work done by the Information Resources department, which was also responsible for the question of copyright. In the event, the question of managing UGC was not addressed by the project, partly because UGC was not involved in the first public deliverables

but perhaps also because of the lack of a management structure for the web team or of a web strategy board.

Some decisions that are needed during the creation of software such as the CIIM may be taken at an operational level rather than being escalated, especially when they do not affect the agreed scope of the product. The CIIM was built by an external supplier, Knowledge Integration, who became an essential part of many such decisions as the functional specification was refined and development proceeded, uncovering various complications along the way. Indeed, K-Int's response to the tender brief was influential (Knowledge Integration, 2009). They proposed using a Solr front end (which had been mentioned in the brief) and deploying semantic web technology (which had not been explicitly mentioned in the brief – see section 2.2.4.2) . The latter was to play a role in managing the contextual content that was so important to the vision of the CIIM, and could also be made available as a SPARQL end-point, supporting the museum's aim of offering its data to third parties. K-Int therefore immediately made a creative contribution to the plans for the system.

Heeks and colleagues investigated the international outsourcing of software and found that success relied heavily upon the relationships between clients and developers. A healthy dynamic involves a high degree of "congruence" between the parties, in terms of systems and processes, information, technology, capabilities, and objectives and values. They highlight how higher congruence fosters trust and describe a "trust curve" along which a partnership must therefore move in order to realise greater value; in their words, "mutual trust

and understanding [...] can help overcome other dimensional differences" (Heeks *et al,* 2000, p. 7 and p. 17).

So if trust is such an important ingredient in the relationship between clients and developers, how is it built up? Whilst personalities and familiarity must play a part here, so do mechanisms, most importantly perhaps the contractual agreement between both parties. After K-Int's appointment it took some weeks for the timetable and schedule of payments to be drawn up and for the legal arrangements to be settled for access to MoL data and systems. With those in place each party could act with greater confidence. However the fact that, through the Exploring 20th Century London project, there was a pre-existing relationship between K-Int and MoL (specifically Sussums and Alex Bromley, who from October 2009 managed the Collections Online project) was undoubtedly significant in terms of their understanding how to manage the relationship and the trust they could place in one another's advice. Sussums' evidence supports this, and a comparison of the architecture of the software that was delivered with that in K-Int's original proposal shows evidence of considerable evolution along the way. A number of discussions are documented between MoL's project manager and developer and K-Int's technical lead, concerning workflow and the relationships between entities held in the system, which continued to be refined after the developers were appointed. At one point, K-Int suggested a major change to the specification because of unexpected technical complications – they proposed moving from using an RDF triple-store to hold all the extracted data in a subsystem ready for editing, to moving the triple-store to being an end-point for the system rather than its heart (which

itself was not implemented initially). The archive indicates that the MoL team agreed to this change quite quickly, perhaps indicating the level of trust that had developed between the parties by that stage.

SUSTAINABILITY: THE CIIM SINCE LAUNCH

The CIIM was first put into public service before all of its planned functionality was delivered, the priority being its support of the Sackler Hall gallery terminals. Since then, although some parts of the design remain to be implemented or exploited, it has started to be used in new ways and to demonstrate its value to the organisation. Ross and Sussums reported that during the first year of operation staff began to understand the potential and talk about novel uses for the system, but this was not universal. Ross recounts how during an executive committee meeting the suggestion arose that staff time on Collections Online's Phase 2 digitisation work should be costed – unlike what happens for the core activities of museums – with the implication that "this was a separate project that needed to be costed absolutely, and that we shouldn't be putting our core staff onto it because that's not what they should be doing" (Ross, 2010). Perhaps the battle to get digital collections seen as a core museum responsibility is not yet won at all levels. Overall, it is still too early to evaluate the product's long-term viability. The fact that supporting the sustainability of other products was at the very core of the business case means both that its intended lifespan was long, and that its value depends entirely upon the utility of those resources that might be built upon it.

In mid-2012, after two years where the web team consisted only of the web content manager, changes began to take place at MoL. A structure for digital

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activity started to be put in place just as a new director took office. A Digital

Collections Programme Board was constituted and, although the vacant core-

funded developer positions were not filled, MoL secured a three year Arts

Council major grant that allowed it to support a number of digital positions and

activities for that period. This programme co-ordinates digital collecting,

digitisation, digital learning, crowd-sourcing, and documentation for digital

collections projects, and the funding pays for a developer specifically for

collections (but not for the main website). A Digital Strategy Board sits above the

DCPB and sets the digital vision for the museum (Looseley, 2012). There are

strong signs of better co-ordination across the museum, then, and in certain

areas – specifically digital collections – more resources have been committed. On

the available evidence it is not possible to say whether this reflects a success for

the CIIM in attracting support from ACE or a renewed effort from MoL itself, but

it does suggest that over the next few years the CIIM is expected to find new uses.

And finally, in October 2012, MoL advertised for a core-funded web developer to

fill the gap left by the departure of its two systems developers in 2008–10

(Museum of London, 2012b).

Collections Online and the CIIM have been instrumental in bringing in fresh

funds from private sources too. Ross recounted how a private funder had been

sufficiently impressed by it to fund the next phase: the digitisation of 90,000

objects by 2015.[128] According to Ross, "they've seen we're a museum that's going

places and they want to encourage us", with no strings attached other than

anonymity and that they were interested in the idea that MoL would look at

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[128] According to the Annual Review 2010/11, this funding allowed Phase 2 to start in January
2011 (Museum of London, 2011).

commercial applications, "almost", she suggested, "being like mentors" (Ross, 2010).

4.1.8 THE IMPORTANCE OF FLEXIBILITY

The CIIM's effectiveness in delivering the various aims outlined in the earlier "Value" section relies heavily upon its being flexible enough to accommodate the requirements of consuming systems, although these cannot all be predicted. These requirements relate to content, data models, functionality, responsiveness and performance, and licenses. The project team envisaged a system that attempted to maximise flexibility in all of these aspects, and we have seen that in the end they secured the resources to implement the fundamentals of these intentions. K-Int's solution added versatility with a more sophisticated architecture that reduced dependencies and enabled the flow of information to be fundamentally altered if necessary. Through the development process, certain requirements were clarified and it became necessary to compromise ultimate flexibility in order to make a more usable system – essentially because having unlimited choices available would make it difficult to organise content efficiently or to design a manageable editing interface. Some requirements were also left unimplemented because they were not necessary for the launch of the system, but the necessary interfaces were available to implement these at a later date as they were required. Both of these design changes resulted from decisions taken by the project team in discussion with K-Int. Overall, then, the flexibility that was seen as so important to its "future-proofing" was delivered by the system.

4.1.9 THE IMPORTANCE OF BUY-IN

Ross and Sussums both indicated that the CIIM's value had become more apparent through the organisation since it became a live system, and that new sources of value had been identified even as the project proceeded. Indeed, as the plans evolved in discussion with K-Int the opportunities they offered became clearer. Once live in the new galleries, though, the wider staff could engage with it more, and curators in particular could see the impact of the their work immediately:

> The curators who've worked on Capital City are delighted because
> what they saw in Capital City was: they changed a record in MIMSY
> [and] within 10 minutes it changed on the Sackler Hall terminals.
> (Sussums, 2010)

As the system has become better understood and accepted, new ideas have started to emerge about how it could support the museum's work, from interpretation and curatorial uses, to commercial exploitation of the collections, to disseminating data to researchers:

> Because of the nature of our collection, the fact that it's so broad,
> there are lots of specialist research projects that want to use our data,
> there are lots of commercial services that want to use the data, things
> like online dictionaries and encyclopaedias. (Sussums, 2010)

4.1.10 THE IMPORTANCE OF CONTENT

The Collections Online project was conceived as a whole – the supply chain for a complete "vertical market" from content creation (collections documentation, based on new workflows and standards) through its management and

augmentation (the CIIM) to its distribution to the public; without the rest of this supply chain the CIIM is meaningless. In order for the CIIM to be a success, then, and for any of the possibilities just raised to come to fruition, it depends on a mass of content. As Sussums explained:

> [F]or me Collections Online wasn't just about the end product, but about building a big set of data inside the institution that can be used by every bit of the institution that needs it [...] The idea of pushing lots of stuff out onto the web is only one part of the reason for doing it, the other part is to make sure that people in the organisation [...] have got a base set of things that they can build tours on, they can write press releases on, they can do their jobs. (Sussums, 2010)

4.1.11 REUSE OF THE CIIM

Beyond the Sackler Hall interface and its web-based version, Bromley (2012) indicates that the CIIM has so far been used in to support one other significant output, a "Picture Bank" that complements the "Pocket London Histories" developed by the museum's then-Digital Learning Officer, Rhiannon Looseley.[129] In late 2012 Looseley became the Digital Collections Programme Manager, managing the "Opening Up to Digital Environments" strand of MoL's ACE major grant, which runs alongside the Collections Online project and shares a technical team with it. Both projects will use the CIIM or feed it content. Looseley reported that one area under her management addresses an objective of the CIIM that is as yet unrealised, namely the use of crowd-sourcing to gather knowledge about

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[129] A number of other "curated groups" have also been assembled (see "Browse the collections": http://www.museumoflondon.org.uk/Collections-Research/Collections-online/BrowseCollection.aspx).

its collections from outside experts – knowledgeable amateurs, history groups, academics and others – that could potentially then be drawn right back in to MIMSY, thus introducing a whole new value stream to the organisation. In 2010, Ross had expressed excitement about this possibility:

> there are certain bits of our collection [where] the expertise to catalogue them resides outside our walls, in amateur groups, enthusiasts... [it's] that idea of targeting particular groups and saying "tell us what you know about this because we don't have the time to research it". (Ross, 2010)

4.1.12 THE IMPORTANCE OF RESOURCING

Demonstrating the "business case" for an activity – such as building a new resource on top of the CIIM – is not always enough to secure the resources to undertake that activity. Equally, when competition for resources is especially fierce the equation between value and resources is upset: resources will be expected to produce proportionately more value. This competition is perhaps reflected at the Museum of London, at which the core resourcing of digital activities has been steadily cut back over the past few years; funds from projects have enabled the CIIM and a variety of microsites and the website redevelopment to proceed in one form or another, but with fewer core staff in place who understand essential systems and can extend or maintain them. But the cutbacks to culture that started to affect the UK in 2010 are making themselves felt still more strongly in other areas of the museum, especially in the curatorial side where dramatic job reductions followed a reorganisation of the collecting departments. This may also reflect a strategic repositioning of the

organisation that de-emphasises its research aspect (especially in archaeological and "pre-modern" areas) and focuses instead on its role within the cultural life of modern London. The strategic objectives of 2010-13 eschewed any mention of collections (Museum of London, 2010a), whilst the annual report of 2009/10 made no mention of research but placed considerable emphasis on outreach, on the 2012 London Olympic Games, and on the capital projects that MoL had then recently completed (and for which a £1.1 million deficit remained at the end of that financial year) (Museum of London, 2010b). This, then, is evidence consistent with the expectations we discussed in Chapter 3: as the priorities of museums evolve, whether through shifting internal values or in response to demand from external stakeholders, and as their understanding of current value and expectations of future value develop, they will (or should) shift the allocation of their scarce resources. In MoL's case, that traditional source of value, the collections, or more specifically the classical curatorial activities around them, appear in recent years to have lost out to other areas of activity.

For the CIIM, the reduction in available curatorial expertise and time resulting from this on-going adjustment in organisational objectives acts as a resource constraint, making it likely that some of the potential uses of the software that had been discussed will not be realised soon. Other areas of activity that have apparently not suffered from the resourcing squeeze (for example, in the Communications or Learning departments) may fare better and find new ways to exploit the CIIM. However, the expectation with the CIIM was in part that it would enable the wider reuse by departments like these of the expertise in the collecting departments, as Sussums observed: "The point is to get Learning to

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use it so that they can capitalise on what the curators do, they don't have to rewrite everything they can just add to it". In its ambition at least, we witnessed here an example of the flow of resources and value across internal organisational boundaries for the good of the whole, as we mooted in section 3.2.2.

MoL's digital activities, in contrast to its traditional collections work, appear to have had more success in attracting resources. But as the CIIM project evidences, the nature of these resources has had more of a project-driven basis, de-emphasising the importance of knowledge retention and technical leadership. This particular resource challenge, then, is connected to the problems of decision-making that we considered in 3.2.3: the need for good information and for the skills to evaluate it judiciously. Collections Online showed MoL investing in systems (with the help of the HLF), but in simultaneously leaving its web team to wither it perhaps under-invested in the means to make the most of those systems. However MoL has now (as we observed above) secured two significant sources of funding to underpin its digital collections work (from a private foundation and from ACE). Together with the anticipated recruitment to the web team itself of a core-funded permanent developer, there appears to be a resurgence in MoL's digital capacity in late-2012. This may finally provide it with the means to deliver more from the CIIM, both through its ACE-funded digitisation and digital collections delivery activities, and by virtue of the availability of greater leadership and technical capacity at the heart of the museum. All in all the picture looks markedly more positive than it did in late 2010, and not merely because of the *quantity* of the resources, but because of the way in which it appears they will be organised and located.

Technical support of the CIIM itself appears secure in the medium term. The Information Resources department has an agreement with K-Int to support it at an agreed cost for the immediate future. In the longer term, the software must demonstrate its worth through the sources of value that it can support, several of which are in development. Its fundamental role beneath the interfaces that are built upon it suggests that, if running costs remain under control, it will have a long future. Whether it will develop all parts of the roadmap that were envisaged in 2008-9 depends greatly upon whether the museum will then be able to exploit these, which remains unclear at present.

<p style="text-align:center">*</p>

Collections Online project was a considerable undertaking for the Museum of London, building both infrastructure and high-profile user-facing parts and, in terms of the scale of the investment, of the same order of magnitude as rebuilding the main website. But we turn next to a partnership project at a scale several orders of magnitude greater in many dimensions including its stakeholders, budget, political significance and ambition.

5 SEEKING VALUE IN EUROPEANA

Europe's cultural and scientific resources accessible for all.[130]

INTRODUCTION

The public face of Europeana,[131] in late 2012, is a web portal containing around 23 million records of items held in public cultural institutions around Europe. This portal, however, is but one aspect of a much wider ambition, sitting amid a web of projects that together comprise easily the largest investment in digital culture so far made by the European Commission (EC).[132] On its own web-pages, Europeana describes its purpose as being to provide a single point of access to the digital collections held by libraries, museums, archives and audio-visual archives across the European Union and affiliated states, both for the benefit of the general population and to help to drive a creative digital economy (see also Poole & Verwayen, 2010). It achieves this by aggregating metadata and digital surrogates, integrating and enhancing the records, and making them available through various channels, notably the portal for end-users and an application programming interface (API) with which third party developers can find other uses for the mass of content. It also drives an ecosystem of digitisation projects, aggregators, and specialised portals addressing niche requirements, and is engaged with a wide variety of commercial and non-commercial partners outside

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[130] See: http://europeana.eu/portal/.

[131] Europeana was previously known as the European Digital Library (EDL). "Europeana" is used here unless referring specifically to the service in its EDL phase.

[132] Whilst it is difficult to establish what funding is directed specifically at digital culture, between 2007-2011, whilst Europeana's prototype and v1.0 phases were running, the eContentPlus and ICT-PSP funding streams directed around €100-120M at this area. See: European Commission (2006, 2007a, 2008, 2009, 2010a).

the cultural heritage sector, from higher education to broadcasters and search engine companies.

By mid-2011, Europeana had reached full service status and was widely known within the heritage sector and, increasingly, outside it. A prototype had been launched publicly in late 2008 and subsequent work built towards a "v1.0" stable service which included many steps aimed at building a sustainable platform for Europeana's long-term health. With the "v2.0" project commencing immediately afterwards it was a good point at which to assess progress. Of particular note was the publication by the Europeana office in January 2011 of a strategy for taking the service through to the end of 2015 (Europeana, 2011a). With funding secured until that date, Europeana has a sustainability plan for the mid-term; this period will also show whether or not the service can find the means and momentum to continue beyond that point.

Many of the challenges to Europeana's sustainability (that we will consider in detail in this chapter) have been present throughout the phases is has seen so far, although they have fluctuated in importance. They include securing funding for the core service and facilitating the establishment and stability of aggregators; persuading cultural institutions to become content partners; engaging the public to use the service in the face of the many alternatives in the cultural "marketplace"; and the numerous technical, political and legal complexities of broadcasting Europeana's content as widely as possible and meshing into the emerging web of data.

There are many important dimensions against which Europeana contrasts with the case study we saw in Chapter 4. Europeana is a large, multi-national

partnership, contrasting with the CIIM at the Museum of London in which we saw a mid-sized organisation working with a single supplier. It is inherently soaked in political considerations, as a product of European Commission funding calls, and yet it aims to be a viable and valuable offering in its own right both for consumers and for business; the Museum of London, in contrast, could refer primarily to its own internal priorities in planning its infrastructure. Europeana has placed at its heart a number of movements driving the evolution of the internet, including content aggregation and distribution, internationalisation, semantic web technology, and user generated content, and because these are common to increasing numbers of digital initiatives in the second decade of the 21st century, we may draw some sustainability lessons with wide applicability. Interestingly, whilst it faces a sustainability challenge of its own, it also poses myriad smaller sustainability challenges, one for each of its contributors and, potentially, one for each business that builds its plan upon Europeana. Consequently, and intriguingly from the wider perspective of this study, Europeana is emerging as a significant feature on the landscape for UK museums, and as part of this environment it may have an impact on the sustainability of various parts of the digital activity of many of these organisations.

This case study is consequently of particular value in investigating several facets of the sustainability question. It examines how Europeana reached some of the decisions made during the build phase that bore strongly on sustainability, and explores the aftermath of those decisions. As well as decisions on what is built and how, evidence is presented of how stakeholders have made resourcing decisions for supporting the completed product to 2015 (although the plans for

the service do not really allow for a 'completed' status but involve continuous change), and we can explore the issues Europeana faces in the interim for ensuring its sustainability beyond that date. We will also see how resources come in many flavours besides financial - not least the content without which Europeana would be a mere folly. The chapter also dissects the effects of partnership on sustainability; considers how scale and political support can magnify the "gravitational field" of what might be just another aggregator; and looks at how long-running projects react to changes in their environment – a paradox that must be faced by most digital infrastructure investments, where long term stability depends upon a certain readiness to change.

5.1.1 INFORMATION SOURCES

The Europeana project, along with its antecedents and the myriad other EC-supported projects in its wider network, have produced abundant primary documentation and in the interests of transparency much of the material is publicly available, if not officially published or widely known. Of such material, we draw here upon an archive including conference presentations, press releases, functional and technical specifications, funding proposals, business plans and annual reports. European Commission policy and strategy documents play an important role too, and we will look at material from some related projects that shed light on how Europeana is seen from the outside.

It is also important to acknowledge that the author has been embedded within Europeana since 2007 as a participant and observer in several strands of its work, with the informed consent of the senior management, and in accordance with the University of Leicester's ethical code of practice. We consequently have

access to a large grey literature from inside the project: draft and discussion documents, minutes of workgroup meetings, and mailing list archives are all used. In all, an archive of over 120 documents is drawn upon. An additional unique perspective comes through the privileged access the author was given to observe a number of meetings, which provided detailed notes on discussions concerning technical matters, user experience, and business planning.

Finally, we draw upon in-depth interviews conducted with some of the key participants in the project. This includes three-quarters of Europeana's senior management team, namely the Executive Director, Jill Cousins, the Technical Director, Jan Molendijk, and the Director of Business Development, Harry Verwayen, as well as David Haskiya, who is responsible for product development. Key stakeholder perspectives come from Nick Poole, Chair of Europeana's Council of Content Providers and Aggregators and CEO of Collections Trust (the UK's main contributor to Europeana), and the unique insights of Dr Luca Martinelli of the European Commission, who until mid-2012 was the ICT programme's primary liaison with Europeana. These serve to illuminate some core questions around Europeana's role and fit within Europe's digital cultural space, technical challenges, business models and the challenge of sustainability to a product that is unprecedented in many ways. Crucially we are offered insights into the decision-making process as it really happened.

This chapter first describes in more detail what Europeana actually is. Next we will look at the historical context within which it arose and how it was initiated and built between 2006 and the present, including an overview of the current vision for its development over the period to 2015.

The Chapter then attempts to give an overview of the project's business planning work, from which follow in depth explorations of the question of resources, the value proposition, an examination of some key decisions made in the formative phases of the project, and the significance of all of these for the sustainability of Europeana, concluding with some of the lessons it provides for our model of how sustainability works.

In terms of the overall narrative of this thesis, this case study will enable us to take a particularly close look at the many faces of "value": how, when the many stakeholders have an outwardly similar aim of producing a social good, this can appear very different from their various perspectives, and how this is processed into priorities, decisions and actions, and is ultimately reflected in the resources that are made available to support these objectives and the fitness for purpose of the resulting agencies and products. But it is also instructive for seeing the many forms that "resources" take and how they appear from different perspectives.

HISTORICAL CONTEXT AND DESCRIPTION

5.1.2 DESCRIPTION
Europeana (known as the European Digital Library until 2008) is an initiative the edges of which are quite hard to define. At its core is the Europeana service itself, consisting of an aggregator of digital collections data, a public web portal, and a set of machine-facing services; it might also be seen as the sequence of projects dedicated to creating and running this core. But at a larger scale, the Europeana Foundation that is responsible for the portal service also shepherds a flock of contributing projects under EuropeanaConnect and other programmes, all of which contribute technology and/or content into the core service, or

explore uses for the material it holds. Beyond this, Europeana is the heart of the European Commission's digital strategy for cultural heritage (European Commission, 2010b). As a consequence, we can detect Europeana's influence or effect in other European activities such as law-making, and perhaps social and educational programmes too. And finally, Europeana is the embodiment of a network of partners and contributing bodies that are its *sine qua non*, providing the content that makes it possible. Much digital heritage funding is now linked to participation in Europeana, either because it comes from the EC or because member states require it.
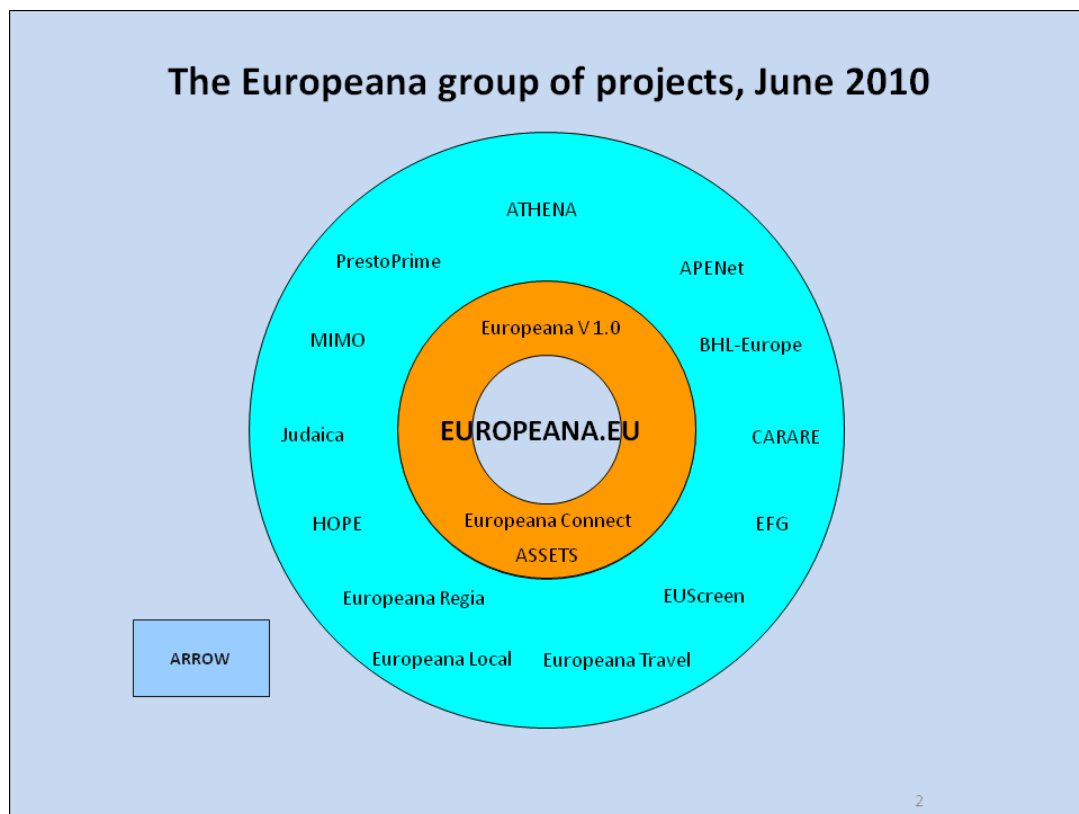
Figure 9: The Europeana group of projects, June 2010 snapshot. *Modified from Meghini & Dekkers (2010).*

It may be artificial to treat it in isolation from the rest of this context, but nevertheless in this case study we will focus chiefly on the sustainability of the Europeana service itself, assessed at the very start of its "v2.0" phase, which is to

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say at the beginning of its life as a full-blown operational service. The critical dependence upon the wider network of projects and partners will always be part of our consideration, however, and at times we will end up discussing the sustainability of Europeana in its wider conception.

A brief description of the core service – its processes and technical architecture – is in order. The first step is, naturally enough, ingestion either directly from primary content owners (for instance, the British Library) or, increasingly, through interim aggregators via standardised automated processes. With content (metadata and image thumbnails) coming from around 1700 providers by the end of the "version 1.0" project, this is an essential step towards ensuring that ingestion is itself sustainable. The data model that Europeana has developed to align content from its diverse cultural sources is a central part of this; indeed it is as important an output from the project as the software through which the service is implemented. The data model enables the interoperability of content from quite different domains – museums, libraries and archives – and of differing characters, whether historical, literary, artistic or scientific. It also permits the linking the data into the wider web and enabling "semantic" reasoning on it. A simple structure (known as ESE) is gradually being replaced by a much more complex and powerful model (EDM) that enables more sophisticated modelling of objects and their relationships both within the system and outside it. Content providers map their metadata to the structure used by Europeana, which allows it to be transformed into Europeana's preferred form, after which various enrichment processes take place, for instance to recognise place names or chronological terms and to add both location data and translations into other

European languages. Contextualising content such as thesauri can also be ingested, or controlled vocabularies and authority records such as artist biographies derived from other sources. The data are then indexed and served to both the portal website and public API. The portal itself consists chiefly of a search engine and a personal and social space named "My Europeana", which enables users to save and tag their favourite items or searches and maintain a profile.
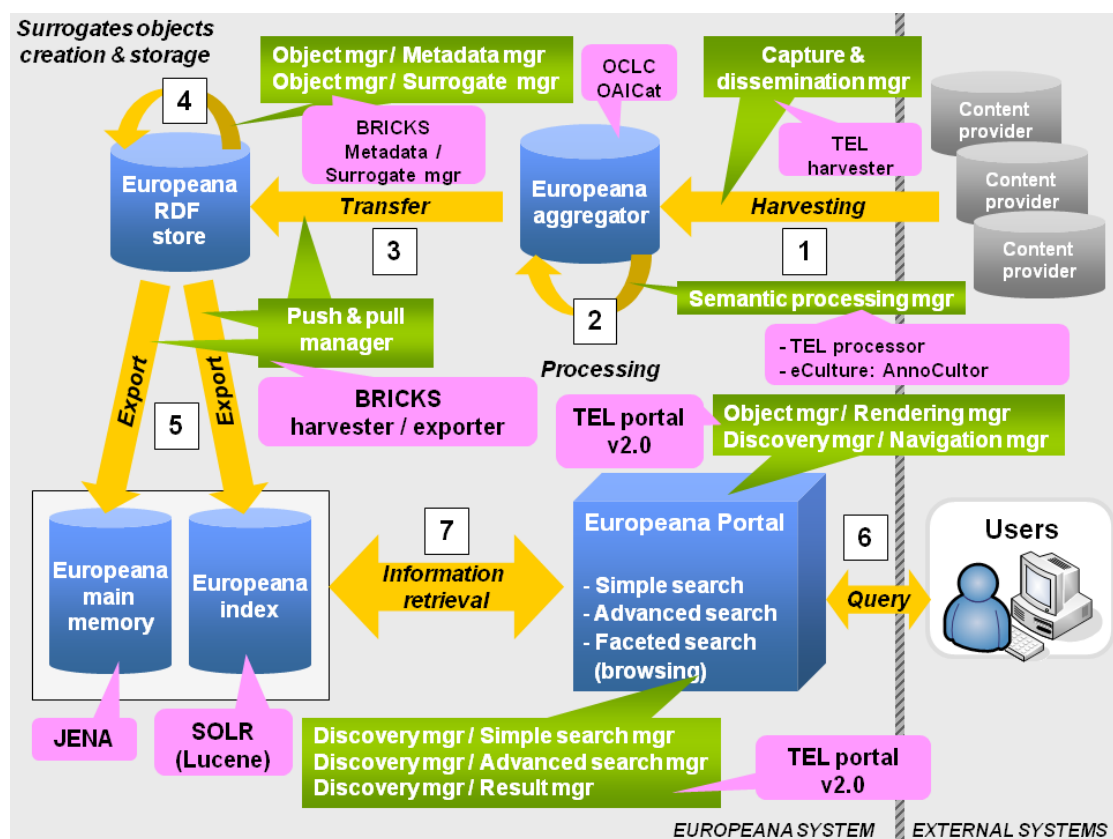
Figure 10: The flow of data through Europeana. Yellow arrows represent processes, storage components are in blue, management services in green and candidate technologies (at June 2009) in pink. The process starts at (1) with data submission by/extraction from content providers and ends at (6) with users and consuming systems. *From Gradmann (2008).*

Technically, the back-end services and the front-end portal are built entirely on an open-source stack of widespread, established technologies, relying heavily on Java, the Lucene/Solr search engine, Linux and Apache (Molendijk, 2011). A large

number of components from other projects (built on a similar stack) are also plugged in, and the Europeana software itself is available as open source-code.

5.1.3 HISTORY

To date a thorough history of Europeana has not been published but to understand its status and prospects requires that one is assembled here. The spine of this account is provided by a combination of interviews, and project and European Commission (EC) documentation. The Commission first took the idea of developing a central catalogue of collections to museums, libraries and archives in around 2000. According to Jill Cousins, Europeana's Executive Director, the proposal fell flat, aside from amongst libraries:

> The one area that it worked in for the Commission was TEL, the European Library, where the national libraries had a real reason to do it. It stemmed from[...] Gabriel, which was an entrance point to knowing where the libraries were and the kind of things that they had in them, the beginnings of just promoting on the Web really. (Cousins, 2009)

The starting point was a pilot funded by the Commission that united the catalogues of the British Library (BL) and the Royal Dutch Library (KB). Cousins (2009) continues "At the end of the project they'd also done business modelling and sustainability...and CENL decided to take it on as a project and nine libraries funded the first tranche of turning it into an operational service".[133] After this decision in late 2003, Cousins herself joined the project to help to develop TEL into a service.

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[133] See also: CENL, 2003a; CENL, 2003b. Gabriel was ultimately absorbed into TEL in 2005.

With 44 of the 47 European national libraries giving access to their collections through TEL by 2009 (Fuegi, 2008), it can be considered a success for the Commission. The digital environment, however, continued to evolve. Google Prints,[134] a collaboration with 15 publishers, was announced in October of 2004, and shortly afterwards the Google Prints Library Project was announced, in which Google partnered with 5 important libraries to scan their catalogues and make them available online. Following this, Cousins proposed a strategic change for TEL:

> I went to the Bibliothèque Nationale in Paris and gave a presentation on why we should use Google as a distribution mechanism [...] and in order to do that I needed to create a crawlable central index. (Cousins, 2009)

Whilst this was not a proposal to invite Google to scan the national libraries' catalogues but merely to use it as a channel for the metadata, objections were raised to the idea of handing a commercial body a role of such pivotal importance for the public good and national identity. The appearance of Google Prints perhaps made key people wary of the search company's power, and it challenged the libraries to raise their game and consider how to digitise their own holdings on a grand scale. In France Jean-Noël Jeanneney, the BnF's director, together with the then President of France, Jacques Chirac, gathered influential support:

> [they] got 6 heads of state to write a letter to the Commission at the time to say that it was important to preserve and digitise European

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[134] The name was later changed to Google Books http://books.google.com/.

cultural heritage within Europe and to foster the multiculturalism of

the web and that it shouldn't be turned into an Anglo-Saxon thing.

(Cousins, 2009)

As a result, a French initiative started in a bid for this digitisation work to be

undertaken directly by national libraries.[135] TELPlus was proposed, to start in

mid-2007 and undertake a full range of text digitisation activities. CENL project

(EDLproject) simultaneously brought the remaining national libraries into TEL,

and also started a road-map of what would be required to build a real EDL.

Seeing its TEL investment bearing fruit, the EC announced a grander strategy,

open for consultation until January 2006:

> Turning Europe's historic and cultural heritage into digital content
>
> will make it usable for European citizens for their studies, work or
>
> leisure and will give innovators, artists and entrepreneurs the raw
>
> material that they need. The Commission proposes a concerted drive
>
> by EU Member States to digitise, preserve, and make this heritage
>
> available to all. (European Commission, 2005a)

The eContent*Plus* work programme for 2005 (relating to work to begin by mid-

2006) expands upon the large-scale problem that the Commission wished to

tackle:

> Cultural and scholarly [...] digital collections [are] often described on
>
> institutional web-sites [but] lack visibility at European and global

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[135] Public-private partnership, however, remained a key plank of the Commission policy
(European Commission, 2006b; European Commission (Member States Expert Group), 2010).

level, because there is insufficient interoperability between existing

networks, across types of cultural organisation and collection, and

across different types of content [...] Effective access and re-use

requires an infrastructure which can support a range of functions,

including: discovery of collections and of individual items; disclosing

conditions for and authenticating use; and integrating tools, such as

thesauri and ontologies, to enable multilingual/multicultural access

and use. Re-use (aggregating and creatively adding to this content)

also requires enriched digital objects which can eventually be

delivered through these services, supporting new economic and

business models and user communities. (European Commission,

2005b)

At that time, the MICHAEL project was in the process of developing a Europe-

wide catalogue of museums' collections (as opposed to items). So when in 2006

the Commission followed up its consultation exercise and the resulting

Recommendation (European Commission 2006b) with an invitation for

proposals for an item-level central catalogue with a much wider scope than TEL

– a European Digital Library – both CENL/TEL and MICHAEL put themselves

forward (Cousins, 2009). CENL, already responsible for the Commission's

brainchild TEL, were successful, and Cousins recounts that it then took some

time for the relationship between EDL and MICHAEL to become comfortable, but

it was nevertheless a very important one. Minutes to the WP1 (Human & Political

Interoperability) meeting of December 2007, for example, record both the

presence of MICHAEL representatives, and a discussion about approaching MICHAEL partners to invite the inclusion of their content in EDL (EDLnet, 2007).

EDL was built upon TEL, and to an extent MICHAEL, but many other existing products, projects and conditions also combined to make it possible. By 2005 many individual institutions had a portion of their collections accessible through online catalogues, with or without digital assets attached. In the case of the UK, much of the digitised material created with lottery funding (see Chapter 2) was contributed to an aggregator, the People's Network Discover Service. Under the guidance of the Collections Trust this mechanism became the Culture Grid which by 2011 had channelled around 600,000 items into the Europeana catalogue (including, via the PNDS, items from the Museum of London). Comparable national initiatives to digitise and aggregate cultural heritage existed in several other states, including the *culture.fr* website in France and *Geheugen van Nederland* in the Netherlands. Work on issues around multilingualism was also underway in other EC projects.

EDL/Europeana has continued since its formation to have an important role as a rallying point, acting as a focus for the objectives of a large number of semi-autonomous efforts and (via the portal) as a manifestation of the Commission's vision of a single multilingual point of access to the Continent's cultural heritage. The latter point is important: the portal enables key stakeholders to assess with ease how their investment in the many strands of digital culture is progressing, and as Cousins (2009) expresses it there is "usefulness of having Europeana as a flagship, maybe not so much as a destination site but [because] it encapsulates the vision, so you can start to brand lots of things around it".

If Europeana built upon and gave coherence to a battery of European digital heritage initiatives, it was also in some ways a response to the wider environment that existed prior its formation. Besides the stimulus given by Google Prints, we can identify a small number of examples beyond Europe where aggregation or digital collaboration between heritage institutions was already happening on a grand scale, and which offered a model for what Europeana might be. The Canadian Heritage Information Network (CHIN),[136] founded in 1972, launched its Virtual Museum of Canada in 2001 and also offers "Artefacts Canada", which searches millions of collections records from over 500 museums. In Australia, Collections Australia Network (CAN)[137] was set up in 2004 to provide a portal for museums of all sizes to present their collections. Such initiatives offered something of a model for Europeana, but faced rather different challenges, audiences, and political objectives. Beyond the heritage sector, the emergence of "Web 2.0" companies (see Chapter 2) also framed the debate around what sort of service would really serve the needs of both users and content providers.[138] The culture of "mash-ups" was taking root strongly amongst both professional and casual developers, due in no small part to both Google Maps[139] and Flickr, and with it the idea of freeing up data and services for creative reuse. This trend, too, left evidence of its influence in records of the earliest discussions of the nascent EDLnet project:

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[136] CHIN: http://www.rcip-chin.gc.ca/.

[137] CAN: http://www.collectionsaustralia.net/.

[138] For example, at an early meeting of the Users & Usability Work Group (WG3), discussion took place about EDL adapting the social tagging model used by Flickr and YouTube (author's observation, EDLnet WG3 meeting, INA, Paris, 3-4 March 2008).

[139] Google Maps: http://maps.google.com.

EDL as a Content Broker (e.g.: via API). A discussion was held on

whether as well as being a content aggregator the EDL should

perform the role of a content broker allowing other portals to take the

data aggregated in EDL and repurpose it in their own portals etc.

(EDLnet, 2007)

As we will see, this idea was ultimately to become fundamental to Europeana's entire strategy. The rest of this chapter will also show how Europeana has endeavoured to respond to evolving trends and to build relationships within and beyond the heritage sector.

The historical background to Europeana's foundation and the early steps in the development of a production-ready service appear as the coming together of a variety of initiatives and trends – certainly not an inevitable outcome, but in retrospect perhaps one that is consistent with the evolutionary steps observed in diverse areas. Web culture and technology, digital cultural heritage, the European political context,[140] emerging economic opportunities and sudden economic challenges, all came together to cause it or to shape its agenda. How their influence was exerted, and whether that makes for a sustainable long-term proposition, will be the subject of the remainder of this chapter.

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[140] The following discussion will show how the EC always saw in EDL an opportunity to strengthen understanding between the states in the European Union and the formation of shared European identity. It is at least tempting to infer that this was made all the more pressing by developments in the 1990s: the launch of the Euro, the accession of many new member states, the resurgence of the far-right parties, all challenging the Commission to strengthen commitment of citizens to a common future.

One of the key deliverables of Europeana v1.0 (deliverable D2.1) was a "business plan for Europeana as a sustainable service" (Europeana, 2008). This document and its subsequent versions (EuropeanaNet WP1, Cousins, Verwayen, Collier, 2008; Europeana, 2009a), together with the archives of activities that fed into it and the *Europeana Strategic Plan 2011-2015* (Europeana, 2011a) that built upon it, comprise our core evidence for understanding how Europeana arrived at a strategy for sustainability in the mid-term.

This planning commenced in the first iteration of the project, EDLnet. One of the key results listed in the EDLnet Description of Work (EDLnet, 2007b) was "A proposal for funding to create an operational European Digital Library service". Between 2007-2009 Cousins, Mel Collier and Harry Verwayen developed a business plan (deliverable D1.3) and a proposal to build an operational service (D1.4) as part of Work Package 1. Verwayen, Europeana's Director of Business Development, led a project on content reuse (Rowlatt, 2008; Verwayen & Ottevanger, 2009) and oversaw other research into both market opportunities and the value proposition to partners (linked closely with work described in the "Value" section of this chapter), resulting in a cost-benefit analysis (Poole & Verwayen 2010), the Europeana Business Plan 2011 (Europeana, 2011b), and most importantly the 5-year strategic plan for 2011-15 (Europeana 2011a).

The business model Verwayen developed (Verwayen & Ottevanger, 2009; Verwayen, 2010) identified four key stakeholder groups (*users*, *content providers and aggregators*, *policy makers*, and *the market*) and translated directly into the three strategic goals for 2010:

1. Make Europeana a valuable service for end-users

2. Create added value for our stakeholders

3. Ensure the long-term sustainability of Europeana [Europeana, 2009b]

Two of these emphasise value whilst the third essentially equates sustainability with resourcing. The role of Verwayen and his business development team was to bind these together: to support fundraising by ensuring that Europeana was important to its stakeholders, and to lay out the plan for the following 5 years (Verwayen, 2011). Priority 2.2 of the *Products and Services Plan 2010* states that their objectives for that critical year include "[to] develop policies and strategies to ensure that motivation for sustaining Europeana remains high for all stakeholder groups [and to] further develop the business model and plan to meet the evolving needs of both Europeana's stakeholders and the Europeana Office." (Europeana, 2009b).
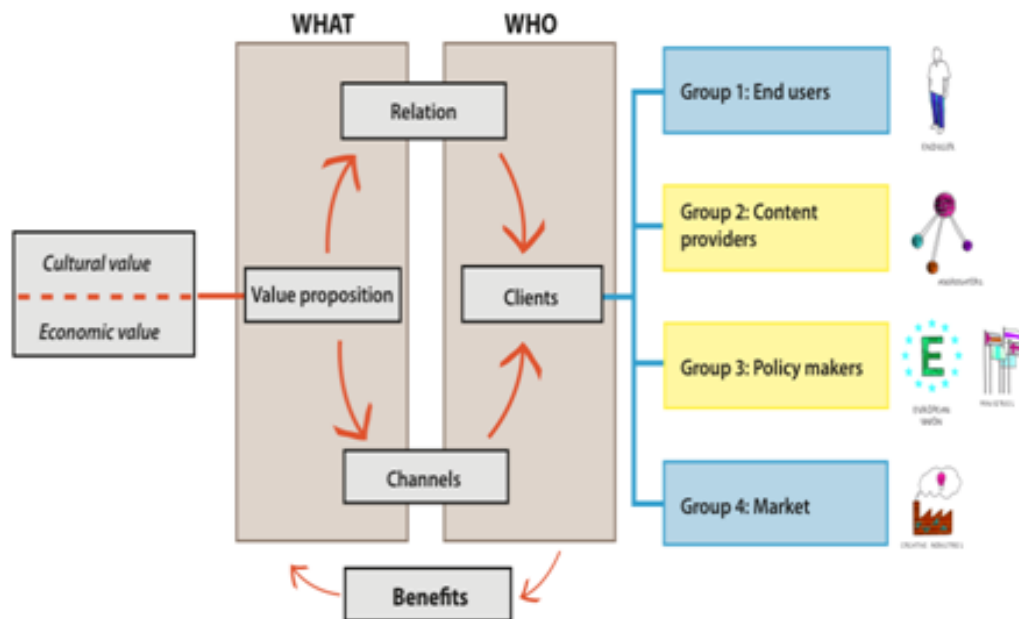
Figure 11: The Europeana Business Model. *From Verwayen (2010).*

By the end of 2010, building on the work started almost three years earlier by Collier, Verwayen and the Business Development section of the Europeana office, the final pieces of evidence regarding the value proposition had been gathered (see Value), and in January 2011 the *Strategic Plan 2011-2015* was published (Europeana, 2011a). This then turned the business model (Figure 11), with its interplay of value and resourcing, into a framework of four strategic tracks reflecting the priorities of all stakeholders groups. These act as reference points for all of Europeana's activities, and of course for our analysis of them.

Business planning concerns itself with the problem of resourcing an enterprise so that it can continue to deliver mission-mandated value sustainably, and the order of the rest of this chapter reflects this perspective. This primary source of value is of vital interest in itself, but in order to understand how to "drive the

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resource engine", as Collins (2005, p. 18) expresses it, it is essential to attend first to what is of value to the *providers* of those resources. This is also recognisably the stakeholder perspective. These two aspects of value – mission-mandated and stakeholder – can in any case be expected to overlap significantly in a social enterprise like Europeana, where the interests of stakeholders *are* the interests of the enterprise. We will therefore look first of all at what resources are required by Europeana in order to fulfil its mission. This will reveal the role of certain stakeholders as resource agents, and provide the context for understanding why developing a value proposition for them was such a critical part of business planning. With the needs of resourcing stakeholders in mind we will then turn to examine value directly.

RESOURCES

In Chapter 3 a distinction was made between two tiers of resources: generic resources (such as money) can be used indirectly and in many different ways but do not themselves create value directly. "Factors", in contrast to generic resources, are resources in the form of actors (or actions) and assets that serve *directly* to create value or to address a particular barrier to value creation. Salient examples include staff, software or content-contributing users, all of which address such barriers or opportunities as maintenance work, improved functionality in a service, or an enriched content offer. "Factor" resources on the whole depend upon generic resources for their supply – as often as not, upon money.

Sustainability challenges – barriers to value creation – also come in myriad forms and can change constantly, likewise the variety of factors that address them, but

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the range of generic resources is smaller. It is hard, then, to generalise about

what factors will be required by a project, but rather easier to predict what

generic resources will be needed.

If we regard resources as being everything necessary for the on-going

production of value, we are led to include in that number certain phenomena

that may not normally be thought of as "resources"; but if we are to have a full

picture of the sustainability "equation" of any given operation they must not be

overlooked. Looking at Europeana, we will consider the resources that the

business planning exercise explicitly identified as key to growth and sustained

success, and ask whether there are any others implicit in or neglected by the

plan. First, though, a brief examination of how resourcing was regarded by the

body that initiated and ultimately owns Europeana, the European Commission is

in order.

5.1.4 THE EUROPEAN COMMISSION PERSPECTIVE

At the outset of the Digital Libraries initiative the European Commission

identified a set of challenges (European Commission, 2005c) facing digitisation

and digital preservation which also serve to indicate what Europeana would

require in order to sustain and grow its service. Financial resources, clear

decision-making processes, staff up-skilling, technological improvements

through research, and political and legal harmonisation all emerge as necessary

requirements to deliver the programme the Commission envisaged.

The Commission is the principal funder of the Europeana projects, but according

to Luca Martinelli, for several years the EC's liaison with Europeana, it did not

wish to determine too closely the shape of its creation: "The idea was not to

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formalise [Europeana] in terms of a legal European public body. We thought that the collaboration [...] had to be kept as flexible as possible. [We would] let these institutions determine autonomously the way forward" (Martinelli, 2012). He remarked that the EC instead saw its role lying in political facilitation and financial support, and indeed it is uniquely significant in underwriting the venture with these "resources". The EC's efforts to tackle legal barriers to the opening up of cultural heritage have been particularly important, as has its coordination of decision-making and action at national ministerial level. A highlights report from Europeana in mid-2010 points out that the Commission's own vision of the project's purpose had led to concrete action:

> [the] principle of re-use of open resources to generate innovation, creativity and knowledge is at the heart of the European Commission's objectives for Europeana. This was reinforced by the Commission's support for the recent publication of the Public Domain Charter. [Europeana, 2010b]

Similarly, Martinelli (2012) noted that, whilst the Commission sometimes wished to avoid legislation and over-regulation in certain sectors, "public-private partnerships for digitisation were spotted as an opportunity and a challenge [...]In particular the first agreement between Google [Books] and the libraries provided conditions that were not optimal in terms of guaranteeing access to public domain works", given their very long exclusivity periods. A desire to limit the length of these periods, and to ensure that public domain material should remain public domain when digitised, led it to introduce the revision to the PSI directive (*ibid*.)

5.1.5 THE EUROPEANA PERSPECTIVE

The archive of Europeana's business planning and mid-term strategy documents

(EuropeanaNet WP1 et al 2008; Europeana, 2009a; Europeana, 2011a;

Europeana, 2011b) reveals that a complex suite of generic and specific requisites

were identified to support the value proposition (see the subsequent section

"Value"). The shift from development project to full-blown service in Europeana

v2.0, in late 2011, meant changes of emphasis in the details of resourcing too, but

the later documents suggest that the overarching priorities remain unchanged.

5.1.5.1 Time

Partner institutions supported Europeana mainly in kind, through the

contribution of both content (see below) and of expertise. Both of these required

a commitment of staff time, which from the beginning of EDLNet were not to be

directly funded (Lindquist & Dawson, 2007). Metadata and assets would require

rights clearance, quality assurance, data mapping and other tasks, and although

some are activities that institutions would in any case pursue, other tasks – such

as mapping to a new data structure – would have no motivation other than to

contribute content.

For Europeana, it was also important to involve partners in its decision-making

processes. This allowed it to draw upon the deep and wide expertise housed in

scores of institutions around Europe and also helped to build the buy-in of such

key stakeholders for the product. Europeana's early workgroups and the Council

of Content Providers and Aggregators (launched in 2011) drew heavily upon this

resource – another contribution of time from the partners whose staff attended.

5.1.5.2 A strong network

A well-established network of cultural heritage organisations and other partners was both a resource and a specific output found in Europeana's *Strategic Plan* (Europeana, 2011a). It was part of the value proposition for the market and intrinsic to the plan's *Facilitate* strand, which aimed specifically to "support the cultural heritage sector through knowledge transfer, innovation and advocacy" (*ibid,* p. 11). That document goes so far as to state that "the real value [of Europeana] is created by the network that develops, disseminates and embeds the new skills, applications and policies" (*ibid,* p. 14).

From Europeana's point of view, then, sharing knowledge, developing productive partnerships, and generating new ideas and innovation require a strong network, and making the network itself a resource for the project during both its build phase and long-term operation. Conferences, workshops and other forms of advocacy were used to build that network of relationships and the archives suggest that this was expected to remain the key to sustaining them in the longer term: "We will continue to organise international plenary conferences as well as workshops in member states to ensure a broad distribution of information." (Europeana, 2011a, p. 14) These activities in turn require a generic resource: money.

5.1.5.3 Content

To deliver its goals Europeana needs large volumes of high-quality content, which must be relevant and representative, in terms of the source, the nature and the medium offered. The Commission itself stressed the importance of improving the content balance in a landmark report in March 2010, which was subsequently adopted as a resolution by the European Parliament:

[the European Parliament] seriously regrets the uneven contributions

from Member States to the content of Europeana [...] It is therefore

necessary to be considerably more active in encouraging the Member

States to make available contributions from their national libraries

and cultural institutions, so that all Europeans have full access to their

own cultural heritage... [Parliament] encourages content providers to

increase the diversity of the types of content for Europeana, especially

audio and video content. (European Commission (Helga

Trüpel/Committee on Culture and Education), 2010d)

The Strategic Plan 2011-15 therefore committed the service to "seek out content from under-represented cultures and countries and aim to stimulate digitisation programmes" (Europeana, 2011a, p. 12).

In the medium term, Europeana foresees alliances with commercial providers, but as at mid-2012 "content" was a resource that depended entirely upon submissions from non-commercial content providers and aggregators. Developing this, in turn, had a number of dependencies. Significant investment in aggregators has been made though other projects in the network, especially ATHENA and EuropeanaLocal, and the financial support of these aggregators is a critical factor in the sustained growth and health of Europeana itself.

Beyond raw cultural heritage content – metadata and basic media – Europeana's vision is to develop contextualising content for this material. Several distinct sources for this are evident in the work that Europeana had engaged in by the end of Version 1.0. Firstly, the portal site's "My Europeana" facility offered users some basic tools for organising and contextualising content for their own needs.

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Secondly, targeted efforts to explicitly gather user generated content were underway via partnerships with Wikipedia and with the Great War Archive.[141] Thirdly, processes were put in place to automate the enrichment of cultural content, using automated "entity extraction" to identify names, dates and places, and adding further information about these inferred entities using established thesauri such as VIAF and Geonames. Some controlled terms were also translated into multiple European languages. Metadata enrichment required several resources: Europeana staff time, contributed code from various EuropeanaConnect projects, and thesauri. The fourth channel for adding context to Europeana content was the API. Launched in 2011, significant investment made in its development and its subsequent promotion through hack-days and competitions. The API enabled third parties to reuse and re-contextualise Europeana's content beyond the portal, and although these scattered contexts themselves may never become part of Europeana's own corpus of data, yet they serve the purpose of enriching its content offer. Finally, a programme of online exhibitions was initiated using content within the portal.[142]

One crucial further factor, beyond the quality, quantity and distribution of the content, is what can be done with it. The provider agreements during the earlier phases of the project did not provide Europeana with a license to release the data in the way required to achieve the aims of the *Distribute* strand of the Strategic Plan 2011-15. However, in September 2011, after a year of

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[141] The University of Oxford ran the GWA project in 2008, digitising WW1-related material brought by the public to road-show events around the UK. In 2011 the GWA was revived as the Europeana 1914-1918 project (http://www.europeana1914-1918.eu/) and the collecting exercise was repeated in several European countries involved in the conflict. The items and stories collected are also into Europeana.

[142] See: http://exhibitions.europeana.eu/.

consultation, the Europeana Foundation took a major step by adopting a new agreement for content providers, the Data Exchange Agreement (Europeana Foundation, 2011a), which mandated the Creative Commons CC0 public domain attribution for all metadata within Europeana (but not images) and which would apply from mid-2012 (Europeana Foundation, 2011b). The DEA was something of a risk for Europeana because of the possibility that content providers would be deterred by the prospect of releasing their metadata as public domain, but its perceived benefits (further discussed below) overcame this risk: the new agreement would permit all of the content held in Europeana to become part of the web of linked data, yielding much more value than if it was locked up in a portal website. CENL immediately announced its support for the DEA after the national libraries "voted overwhelmingly to support the open licensing of their data" (CENL, 2011), followed shortly by EUScreen (which aggregated rich linked data about television recordings and was perhaps the most commercially-orientated of all EuropeanaConnect portal projects)(EUscreen, 2011).

5.1.5.4 Software

A digital infrastructure project inevitably depends heavily upon software. Europeana invested significantly in custom development work, building software for ingesting, processing, managing and displaying content. This custom codebase was built upon a set of existing programmes, frameworks and languages (a software "stack"). Together these form a critical resource to be maintained and updated over the years in order to enable the service to continue to function and to improve, but for this several types of resource are required.

Developing and maintaining the custom codebase is fundamentally a straightforward question of funding, whether to support an in-house team or external developers (see *Staff,* below). A long-term strategy for maintaining and improving the externally-sourced underlying technology is, however, a more complex question. From the outset Europeana made a strategic choice to develop upon a stack of established open source products such as the Java language, the PostgreSQL database, the Solr search index and the Apache web server. This decision appears to have been based in part upon the legacy of preceding projects such as TEL, upon which Europeana built, together with a desire to avoid becoming dependent upon commercial software suppliers. It also meant that Europeana's custom development was likely to be a better fit with the software contributed by related projects, and, as Molendijk (2011) expressed it, it was a good choice for ensuring robust coding by highly professional developers.

Removing the dependency upon commercial software avoided the associated costs of licensing and re-licensing software (potentially reducing the requirement for financial resources), and ensured that Europeana was not tied to a commercial supplier's product development road-map but remained, in principle, free to further develop any software that it used. Despite this theoretical freedom, however, a dependency existed upon the global open-source software community that maintains and extends the core of these open-source products.

Thus there were two key "suppliers" of externally-sourced software to the project. Firstly the open-source software community that collectively develops

Solr, Apache and other core software that Europeana uses. The ethos of this community is that users of the software will contribute to it where they can, although generally there is no requirement to do so.[143] Participation in the community is nevertheless the best way to influence its roadmap or to get assistance with bug-fixes and improvements, and Haskiya (2011) indicated that it was a deeply-held principle for the project to give back to open source communities, especially those concerned with digital libraries. The other supplier was an ecosystem of European projects within and outside the Europeana network, where much research and development was undertaken. As a draft of the business plan dated 2008 states, Europeana would "be part of the EU innovation frameworks thus benefiting from research and content development projects undertaken in different countries and domains" (EuropeanaNet WP1 *et al*, 2008, p. 6). Once delivered to Europeana, an on-going service, further improvements and maintenance would likely become its responsibility, potentially a costly business. The *Facilitate* strand of the Strategic Plan outlined one tactic to tackle this issue over the long-term, namely to build momentum around EuropeanaLabs,[144] encouraging the growth of a community of developers to refine the existing software and collaborate on new ideas.

5.1.5.5 Housing and IT hosting

The core team of Europeana and the Foundation were accommodated by the Koninklijke Bibliotheek, the Dutch national library, in the Hague. KB's in-kind contribution covered the full cost of housing of 25 members of staff (and

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[143] The Apache License 2.0 attached to key parts of the stack Europeana does not require that modifications to the software be licensed in the same way, nor contributed back to the community. http://www.apache.org/licenses/LICENSE-2.0 It is, however, actively encouraged (see for example http://wiki.apache.org/solr/HowToContribute).

[144] See: http://www.europeanalabs.eu/.

additional staff at cost price) under an agreement running until 2015. This also covered some IT costs, whilst other hosting was budgeted for.

5.1.5.6 "Will"

The political will "to turn projects into operational systems" is cited explicitly in the project's own documentation as an ingredient of sustainability (EuropeanaNet WP1 *et al* 2008, p. 6), in part because the plans for Europeana's medium term would rely upon its securing significant public funds from the EC to shift from running as a project to operating as an on-going service. In addition, we previously noted a number of legal obstacles around copyright and intellectual property threatening the ambitions expressed for Europeana – and more generally for the digitisation of culture in Europe – in the period to 2015. Europeana looked to the will-power and capabilities of the politicians of the EC and European Parliament, co-ordinating with national politicians, to tackle these challenges:

> We will work with the European Commission, with policymakers in Member States and with partners to support research into solutions such as collective licensing and registries of rights. (Europeana, 2011a, p15)

The signs in 2011 suggest that the will-power to solve the legal questions is present and effective in the person of the EC's Vice President responsible for the Digital Agenda, Neelie Kroes, who outlined efforts to open access to public sector information in a speech to the OpenData Forum Europe Summit 2011 (Kroes, 2011). Her intention at that point was to introduce a proposal for an improved Directive on the re-use of public sector information: "I want requirements to be

more encompassing, and specifications improved [...] Getting out the data under reasonable conditions should be a routine part of the business of public administrations." Announcing also a new portal for access to this information, it was clear that Kroes' expectation of open access to data, first espoused in detail in the *Digital Agenda for Europe* (European Commission, 2010b)*,* was congruent with Europeana's plans.

5.1.5.7 Trust and brand

Amongst the list of "resources" upon which it depended in order to build a healthy sustainable service, Europeana placed great importance upon the reputation of its content providers. The Strategic Plan stated that "[the] trust that the world has in the names of our content providers has been built over centuries and cannot be equalled", whilst the organisation itself needed to develop its own brand to become a "flagship for new content and services." It went on to claim that "it is becoming established as the trusted and comprehensive resource for authoritative cultural heritage content from across Europe." Building the Europeana brand in this way was seen as necessary for developing its market of end-users and business partners. The Plan identified a clutch of activities aimed at strengthening the consumer brand, including direct marketing to users, search engine optimisation to improve awareness and use of the portal site, and further development of the portal to include "storytelling, guest blogging, surveys, quizzes, reviews, commentaries and new ways to deliver feedback and foster dialogue" (Europeana, 2011a, p. 18). In October 2011, at the start of the v2.0 project, a redesign of the portal was launched with a stronger focus on free-to-reuse content, exhibitions social media (Europeana, 2011d).

Equally important were its relationships with its resourcing stakeholders, especially content partners, where it needed to nurture their confidence that it would use their data responsibly and deliver them measurable benefits. Jones (2005) examines in detail the relationship between the aspects of a brand presented to various stakeholders; the dependency, for instance, of consumer brand awareness upon support from marketing channels such as distributors. In this example, it is necessary to maintain brand equity with the distributors – that is, their willingness to subscribe to and to promote the brand. This "channel equity", as Jones refers to it, is but one of many brand equity relationships that Europeana needs to maintain, each of them distinct:

> Each relationship has its own logic, which determines: (a) what is
> important; (b) how value is measured; and (c) how value is
> communicated. Thus marketing messages need to be adjusted to suit
> the particular characteristics of each stakeholder. (Jones, 2005, p. 25)

For Europeana, the consultation exercise underpinning the strategic plan served to make this marketing more precise. To continue this in the long term, an operational service would have to maintain its participatory network and foster a sense of involvement for all of its provisioning partners – perhaps content partners most of all.

Beyond its consumer and resourcing stakeholder groups, Europeana needed to build awareness and a strong relationship of trust with the developers upon which it depended to deliver its *Distribute* strategic aim. By the beginning of Europeana v2.0 this relationship was still in its infancy, but two chief areas of activity targeted this need to build its reputation and importance. Firstly, a series

of "hack days" and competitions were run around Europe and promoted amongst communities of heritage, culture, educational and open data developers. Secondly, the push continued for a liberal licensing regime for data in Europeana. The data exchange agreement announced in September 2011 (see above) enabled Europeana to participate fully in the open data movement,[145] another step in building its reputation amongst developers.

5.1.5.8 Staff and knowledge

Staff, as a resource, are of course closely tied to both finance and housing. The core Europeana and Europeana Foundation staff includes the directorate, and teams for press and marketing, business development, software development, and finance and other back-office duties. Considerable growth is expected to be required in order to deliver the plans for an operational service running to 2015, with a staff of around 30 at the end of 2009 growing to around 50 over the following 6 years (EuropeanaNet WP1 *et al,* 2008, p. 6). The budget for this period reflects this expectation. Budget alone does not solve the challenge of building capacity, however: Molendijk (2011) and Haskiya (2011) both reported considerable turnover amongst staff, in particular amongst developers and the metadata ingestion team. As Cousins also observed (2009), the youth of the staff engaged in the project may be a factor. Verwayen (2011), perhaps as a consequence, remarked upon a renewed emphasis upon listening to the "wants and needs" of the people working directly within the Europeana office.

The expertise of the core Europeana staff is supplemented by that of network members, outside experts, consultants and others. Mechanisms include the

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[145] See: http://www.opendata.org.

workgroups, a technology watch, and mailing lists. A far wider pool of expertise is tapped into by the project's engagement with established knowledge-sharing communities including Wikipedia and the Open Knowledge Foundation.

5.1.5.9 Money

Inevitably, money is required for almost anything Europeana wishes to achieve including most of the factors previously mentioned. Europeana's revenue-raising strategy depends heavily upon public funding. In 2008, the plan envisaged an EC contribution of around 50% of the budget by 2011, Member States "member heritage institutions" at 45% (€1.2M from 27 states), and 5% from other sources. These would not, however, include content partners, the *Outline Business Plan* stating that "we do not foresee a financial opportunity in the content providers; payment would be an absolute barrier to participation and they are already contributing *in natura*" (p. 28).

The plan shows the target contribution of market revenue increasing from 5 to 15% of total income (€555,000) by 2015 and identifies opportunities for corporate sponsorship, selling services or data to search engines and semantic operators, and affiliate marketing. Advertising, however, was considered unlikely: "Advertising could be politically difficult for a public site but would potentially provide a small revenue stream" (Europeana, 2011a).

Europeana used a number of strategies to minimise costs. These were baked into the strategic approach from an early stage and included the decision to "encourage institutions to organise the delivery of their content through aggregators to ensure a longer term maintainable work flow" (Europeana, 2011a, p.12). Together with a strong emphasis on interoperability work and

detailed co-ordination with other Europeana Foundation & eContentPlus projects, this represented an invest-to-save approach intended to ensure long-term financial sustainability.

<p style="text-align:center">*</p>

Europeana's resource requirements for the period 2011-2015 appear from the planning documents to be quite thoroughly accounted for. Its difficulty, perhaps unusually, is that it may relatively easily secure the financial support it requires – at least, sufficient support to continue the service as it stood at the end of v1.0 – but at the same time its other critical resources are somewhat harder to predict. Notably, content and brand appear to be both critically important and to have a large degree of uncertainty attached to them. They exist in a somewhat unpredictable relationship with one another, with finances and political and legal support, and whilst Europeana's management have striven to tie all of these together it is clear that they are subject to externalities that make it impossible to guarantee that all of these vital resources will be secured in sufficient measure to deliver on its plans. Securing the commitment of resourcing stakeholders brings us back to the question of the value proposition to these parties, to which we now turn.

THE VALUE PROPOSITION

In principle at least, value should be the reason for Europeana's existence and the means through which it attracts the resources necessary to deliver its promise. Here, then, we will look at who Europeana has identified as its stakeholders, and how it came to understand and address the value proposition sought by these stakeholder groups.

5.1.6 *Stakeholder identification*

Value is dependent upon perspective: it is not inherent in an outcome but attributed to that outcome by an interested party. Consequently, understanding the values of stakeholders is especially important for an enterprise that exists to increase the social good, but as we discovered in Chapter 3, stakeholder *salience* does not necessarily translate into stakeholder *identification* (Mitchell *et al*, 1997)*.*

Europeana, like so many of the operations carried out on behalf of government, is of course a social concern, and it is also a large and varied partnership. Its value proposition is consequently complex and multi-faceted, and it is appropriate that the project takes a stakeholder-based view of its purpose and priorities. It lists its stakeholder communities in the *Strategic Plan 2011-15* (Europeana, 2011a, p. 6)[146] as being *users*, *content providers and aggregators*, *policy makers*, and *the market*. One might also add the staff of the Europeana office and its directing boards, the other network projects, and the members of working groups. Following Mitchell *et al*'s model, all of these have both a legitimate claim and notable influence over the project's direction of travel. The legitimacy and urgency of their claim arises from their having a stake in its success, and because Europeana depends in turn upon each group for the resources necessary for its success.

Let us now consider what Europeana has come to understand the value proposition to be to these stakeholder communities, and how it has reached this understanding.

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[146] The strategy is organised into four strategic tracks – Aggregate, Facilitate, Distribute, Engage – which "are the means by which Europeana will continue to deliver value to our stakeholder groups in the years 2011-2015" (p. 11).

5.1.7 USERS

Europeana's target users range from casual personal users to professional researchers, school pupils to holiday makers, heritage professionals and even the open source software community. Europeana operated a User Test Panel, which could not reflect this variety in full but nevertheless provided a set of values or desirable attributes for the service that appear broadly applicable (Europeana, 2011a.). They sought in Europeana

1. a trusted source

2. ease of use

3. reuse

4. "in my workflow"

Although the portal website served the needs of some types of user, others would need more targeted services, and the four values evidence this. They indicate users' desire to both employ Europeana content for their own purposes (#3), and to find it where they are already operating (#4); desires which have implications for the licensing of content and for the services that enable it to be channelled into novel contexts, for instance through public APIs (a primary aspect of the strategy's "Distribute" track).

The strategy's *Facilitate* and *Distribute* strands responded to the value placed in Europeana as a trusted source with an emphasis on branding and best practice, as well as its work towards the Europeana Public Domain Charter and advocacy at a political level concerning orphan works.

The role of users in value generation concerns the delivery of mission-based value more than the generation of resources for sustaining and growing

Europeana. Attracting users and ensuring that they have a rewarding experience is the primary goal, and if it is achieved then positive recognition of the Europeana brand will increase and feed back into increasing visitor numbers and corresponding benefits for other stakeholders. However users can also, whilst serving their own needs, provide benefits to Europeana and other stakeholders. The "My Europeana" personal space enables a user to collect items and tag them, and to save searches. The crowd-sourced knowledge that may arise from extensive use of this facility was seen as potentially having great value to content providers, offering them ways to enhance their own metadata as well as metrics about the impact of their collections. Europeana itself can improve its search indexes with the same data. The portal also facilitates users in spreading the word about the service through social media. These investments in the portal are relatively modest, in keeping perhaps with an overall strategy that emphasises distribution beyond the portal, but illustrate the way in which the value proposition to users is linked to the value proposition to other stakeholders.

5.1.8 CONTENT PROVIDERS AND AGGREGATORS

Museums, libraries and archives contributing content, and the aggregators that serve to bring much of their content together prior to its submission to Europeana, may just be the most difficult stakeholder group to characterise or to satisfy. The needs of content owners differ from those of aggregators, who act as brokers, and occasionally their priorities may appear orthogonal or in competition with one another.

Unsurprisingly, this group was well represented in Europeana's decision-making process with many sending representatives to conferences or participating in

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one of the work groups. However in the project's first phase, EDLnet, consultation of this group was focussed on establishing the network (WP1), on agreeing data standards and technical requirements (a complex problem tackled by WP2), and using its expertise to develop initial user requirements (the responsibility of WP3, "Users for usability"). This was sufficient to ensure the participation of several hundred partners by the end of that EDLnet, but it was accepted that Europeana v1.0 needed to develop the value proposition to these stakeholders, and that this required them to have a stronger and clearer voice. Ev1.0 started with a workgroup (WG1.1) for aggregators, later replaced by the Council of Content Providers and Aggregators (CCPA),[147] which gave a voice to all content owners.

It is easy to see that without a healthy provision of content the service would be pointless to users, to the market and to its funders. Achieving the buy-in of this group was therefore critical, and dependent upon a consultative approach that included a workshop and a survey shortly after the CCPA commenced. By the end of 2010 Europeana consequently had a sound understanding of what would motivate that stakeholder group, with the values of *visibility*, *services* and *revenue* emerging as being of particular importance (Europeana, 2011a).

5.1.9 POLICY MAKERS
This group refers to those politicians that set the framework strategy for the Europeana group of projects and govern the bulk of the budget. Most important amongst these is the European Commission, whose involvement we have already explored in some depth, but policy-making in the European Union is more

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[147] In December 2011 the CCPA changed its name to the Europeana Network but we will only use "CCPA" here for clarity.

complex than that, and the EC co-ordinates with the European Parliament and its committees and councils, which must also approve its recommendations. The EC's recommendation on digital libraries (European Commission, 2006b) is a case in point, its approval by the Parliament's Culture Council in November 2006 (Council of the European Union, 2006) paving the way for EDL's creation. In their approval, the Council also advised the creation of a group of representatives of member states. The resulting Member States Expert Group (MSEG)(European Commission, n.d.) is one mechanism through which the countries of the EU have influenced the direction of the EDL/Europeana programmes(Martinelli, 2012). Member state ministries are also involved directly as stakeholders in this group, albeit to varying degrees, with some contributing funds directly to support the service.[148]

As we have seen, the EC's declared hopes for the project lie in reinforcing the community of Europe, in building stronger networks and communications between cultural bodies, in boosting the digital economy, in building infrastructure for the long term, and in responding to the strength of international business. The foundational values of the project are clearly stated in the various documents that led to the creation of EDLnet, and in the subsequent funding calls and responses that have sustained the enterprise since then. Cousins and her team liaised regularly with officers of the EC's Directorate General for the Information Society and Media (DG INFSO). DG INFSO's own mission was "to make every European digital" (European Commission,

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[148] In Europeana (2009c) the contribution from ministries between 2010-2015 was projected to be around 15% in 2010 declining to 5% in 2012-15. Poole and Verwayen (2010), however, revise this to around 20% in 2011, declining to 2% in 2014-15. The decline is largely due to the Dutch Ministry OCW reducing its subsidy to the Europeana Foundation.

2007b),[149] and this was developed into a fuller strategy with the publication in 2010 of the Digital Agenda for Europe (European Commission, 2010b), of which Europeana forms a significant part.

The *Digital Agenda* forms one of the seven keystone initiatives in the *Europe 2020* strategy (European Commission, 2010c), launched by the Commission in March 2010. The economic crisis that started in 2008 left a powerful stamp on this document that percolated into these initiatives. Far from threatening the European digital heritage programme, the crisis may have in fact have given it greater urgency by reinforcing the Commission's recognition of the need both for the economic benefits and for the strengthening of social ties that Europeana and associated programmes have the potential to facilitate, as the *Digital Agenda* explains:

> Europe 2020 sets out a vision to achieve high levels of employment, a
> low carbon economy, productivity and social cohesion, to be
> implemented through concrete actions at EU and national levels. This
> battle for growth and jobs requires ownership at top political level
> and mobilisation from all actors across Europe [...] The objective of
> [the Digital Agenda for Europe] is to chart a course to maximise the
> social and economic potential of ICT...for doing business, working,
> playing, communicating and expressing ourselves freely. Successful
> delivery of this Agenda will spur innovation, economic growth and

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[149] In July 2012 DG INFSO was reshaped into DG Connect (http://ec.europa.eu/dgs/connect/index_en.htm). Europeana is specifically mentioned in DG Connect's priorities for the "creativity" unit of its "Media & Data" directorate, including support until 2020 (European Commission, 2012c).

improvements in daily life for both citizens and businesses.

[European Commission, 2010b, p. 3]

This document highlights how the Commission draws the connection between the objectives of Europe 2020 and the need both for its political support and for a sustainable financial model in order to achieve those objectives. A case in point is the digitisation of cultural content and the opening up of access to it, which the EC identifies as requiring not only a increased public funding (mixed with private partnership), but also the removal of legal barriers:

> Fragmentation and complexity in the current licensing system also hinders the digitisation of a large part of Europe's recent cultural heritage. Rights clearance must be improved, and Europeana - the EU public digital library - should be strengthened. Increased public funding is needed to finance large-scale digitisation, alongside initiatives with private partners provided that they allow a general accessibility of Europe's common cultural heritage online. [European Commission, 2010b, p. 30]

Finally, Key Action 15 of the same document commits the Commission to "propose [by 2012] a sustainable model for financing the EU public digital library Europeana and digitisation of content" (*ibid*, p.31). Put another way, in the *Digital Agenda* the Commission drew its own equation of sustainability, connecting the value that Europeana enables with the need to continue to resource it financially.

Europe 2020 and the *Digital Agenda* gained the support of the Council of the

European Union (comprising the ministers of all member states) in November

2010. Records of the Council meeting indicate that participants placed particular

emphasis on the digitisation of heritage and on Europeana itself, as well as

solving legal issues:

> As priority actions, ministers singled out the digitisation of cultural
>
> heritage and of cinema as well as the development and sustainable
>
> financing of Europeana, the European digital library. In addition,
>
> delegations stressed the importance of increasing legal access to
>
> cultural and creative content online and of intellectual property rights
>
> in this respect. (Council of the European Union, 2010)

Implementation of the legal changes referred to above cannot be achieved

without the support of member state ministries, giving these remarks

considerable weight, and they evidence again the objectives common to this

stakeholder group.

Another segment that might be included in this group would be national

strategic bodies with delegated power or responsibilities. In the UK the MLA

served this role at the start of the Europeana project before their digital brief

was passed to the Collections Trust (see Chapter 2). This class of stakeholder is

unlikely to bring a financial contribution but can be influential in the

dissemination and adoption of standards, in setting policy (either directly or by

influencing upwards) and in co-ordinating national efforts and bringing content

partners on board. They also have the potential to act as aggregators of opinion

for their constituency of cultural heritage organisation and to pass this on to Europeana through working groups, the MSEG or other means.[150]

A picture emerges, then, of a consistent set of values and objectives attached by the politicians of Europe to the programme of work centred on Europeana. Europeana's Business Development Team developed a value proposition based on their understanding of these priorities, refined with feedback gathered through a survey of the Member States Expert Group. Together with workshops involving network members, this allowed them to develop the proposition into the values listed in the Strategic Plan: *inclusion*; *leadership*; *education*; and *economic growth*. With the possible exception of leadership, one can also identify these values in the project's archive from as early as 2005, as might be expected given the Commission's influence in defining Europeana's direction from the very start.

5.1.10 THE MARKET

With stimulating the digital economy a primary motive for Europeana's foundation, it is natural that "the market" forms one of its target constituencies. Europeana needs to understand both buyers and sellers in its market. Sellers are understood to equate to the content providers and aggregators discussed previously. But how has Europeana come to understand the buyers in this presumed market, and how did its plans develop to reflect the value that the market sought?

In mid-2010, as part of the wider consultation exercise, Europeana conducted a survey to gather responses from the Europeana network to a set of value

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[150] As previously noted, the Collections Trust has a particularly significant role here because the CCPA is chaired by its CEO, Nick Poole.

propositions for commercial operators that Verwayen's team had assembled. The Europeana network, although predominantly made up of non-commercial bodies, also contains some "market players" or representatives of them, particularly in the area of audio-visual archives, where partners include the European Broadcasting Union[151] and the International Federation of Television Archives[152], the members of which include many of Europe's largest broadcasters. Other commercial partners participate in network projects like EUScreen and the Biodiversity Heritage Library – Europe. Responses to the survey were further refined in a Business Strategy workshop from which the following priorities emerged: *open access*; *premium services*; *access to network*; and *brand association.*

The "Facilitate" and "Distribute" tracks of the Strategic Plan were particularly relevant to the interests uncovered in the consultation. *Open access* related strongly to two areas in which Europeana is significantly active: data services, and open metadata licensing. "Facilitation" includes advocacy in pursuit of better, more connected data, and lower barriers to access. But Europeana also holds a position that has not previously existed, between the full breadth of the cultural heritage sector in Europe and the law-makers able to tackle difficult legal issues around orphan works and access to public domain data and content, and it plans to "work with the European Commission, with policymakers in Member States and with partners to support research into solutions such as collective licensing and registries of rights" (Europeana 2011a, p. 15). The roadmap to open access to data is built around a two-pronged strategy: linked

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[151] See: http://www.ebu.ch/.

[152] See: http://www.fiatifta.org/.

data[153], accessible through static pages and files, and the APIs that enable third party developers to programme using the services and tools that Europeana itself is built upon. Planning for the APIs started during the EDLnet project (Ottevanger, 2008a, 2008b; Haskiya, 2010), together with work on the marketable content reuse opportunities they could provide (Verwayen, 2009), and in early 2011 two APIs were opened up to developers in the network. Whilst a significant step forward, this also highlighted the related issue of restrictive licensing, because with the agreements then in place with content providers it was not possible to open the full dataset up to developers from beyond the network or from the commercial sector.

Access to the network highlighted Europeana's role as a rallying point or a single point of entry to a very large number of organisations. Knowledge transfer and the fostering of new partnerships are written into the strategic plan, and each of Europeana's phases brought together around a dozen projects, each with a mixture of commercial and non-commercial partners. It is evident that for those partners at least, access to the network was a natural side-effect of partnership. Beyond this it is less easy to see how the strategic plan will aid access to the network, except by acting transparently as an "introduction agency" through its search portal.

The demand for *premium services* was not reflected in the purely consumer-focused portal site that was the primary end-point by the end of Europeana v1.0 in mid-2011. The reuse project had, however, identified its first targets – the education and tourism markets:

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[153] See: http://linkeddata.org/.

We will partner with players in the public and private sector who are
able to integrate Europeana content into services targeted to specific
user groups. Our initial focus is on provision of services to education
and we will continue to work with partners like European Schoolnet
to develop ways of integrating heritage content into multimedia
learning resources. [Europeana 2011a, p. 17]

The potential of *brand association* acting as a motivation for commercial agents
to use Europeana is a powerful advantage for the service. Its scale and breadth
give it scope to develop a brand with a uniquely wide penetration and to form
partnerships with other established and trusted brands in order to reinforce
user understanding of its role and values. In Europeana v1.0, it explored ways of
working with Wikipedia, brokering collaborations and leveraging both brands to
mutual advantage. But perhaps the strongest reason for stakeholders to want a
strong Europeana brand with which they can associate is that content and data
that comes from that source can then carry a recognised stamp of quality and
authority whether it originally came from a national museum or a little-known
archive. Any Europeana-powered application can then piggy-back on the trust
and reputation inherent in the Europeana brand.[154]

Key to achieving this degree of trust and the brand that can be built upon it is the
"aggregate" strand of the Strategic Plan, because the data that reaches it needs to
have sufficient mass to attract users and developers, and because the data
standards, ingestion processes and post-ingestion enrichment are the
underpinnings of the quality of the data that is so crucial.

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[154] There are, however, interesting issues around trust when data-sources are mixed together in
the context of "mash-ups". See Lee, Kaufmann & Buss (2011).

There remains a tension between the need to raise a certain amount of revenue outside of public sources, and the resistance of some partners to the idea of Europeana making money out of "their" content. It may be possible to distinguish between the activities that would amount to reselling what providers or aggregators themselves would otherwise be able to sell, and those that only become possible because of the aggregation of large quantities of metadata. For instance, 23 million object records is sufficient to extract potentially valuable information in the form of statistics, trends, or relationships between terms or dimensions such as location or dates. These derived data could be packaged up or built into services without reselling the original metadata. The integration of multi-lingual vocabularies into the data also enhances their value. There is also perhaps a distinction between the sale of metadata and the sale of a service built upon that material, for whilst the metadata itself must be freely available in order to qualify as "open" (a primary objective of the project), any services built upon it to search, analyse, visualise or otherwise add value to the data may still be suited to, for example, a tiered pricing model.

5.1.11 THE EUROPEANA OFFICE, BOARDS, NETWORK AND WORKGROUPS.

It seems inevitable that members of the core project team, of the governing infrastructure, of workgroups and of the wider network would all have had their own motivations and hopes for the project, and also a large an effect upon the organisation achieving its objectives. Thus they constituted a critically important stakeholder group in the sense that Freeman intended (1984), but they were not listed as stakeholders in the Strategic Plan.

Whilst Europeana was not offering a value proposition to the group as an explicit part of its strategic plan, Barnard (1938/1968) makes it plain that satisfying the motivations of the individuals that make up an organisation is necessary for it to succeed, and excessively violating their interests will lead to their non-participation.[155] Notwithstanding some staff retention issues (see section 5.1.5.8), the least that might be presumed about the "value proposition" to this group is that it was generally sufficiently strong to retain their participation, which is perhaps unsurprising given their influence over the planning process.

REACHING THE KEY DECISIONS

We have already looked in some depth at the structures and processes by which Europeana arrived at its decisions during the build phase and intends to do so as an operational service. We have also seen some of the routes through which resourcing stakeholders reached their respective decisions. Our concern here is to address the question: what impact did these decision-making processes have upon the long-term viability of the service, and did they result in decisions that fairly reflected the true value and costs involved? Our approach is to identify and evaluate some key decisions that influenced sustainability.

The decisions of resourcing stakeholders were of course critical, and bore directly upon sustainability, but our focus here is chiefly the decisions over which Europeana itself had mastery and through which it hoped to demonstrate to its stakeholders its potential for delivering value. Several of these decisions were arrived at in the process of business and strategic planning that we examined earlier. This strategy provided a clear direction, so the decisions it

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[155] Barnard is further discussed in the next section, "Reaching the key decisions".

embodies are of critical importance. But we turn our attention first to the EC's initial decision to set up EDLnet.

It is important here to remind ourselves that, as Herbert Simon argued, decisions are made by people and not organisations (Simon, 1978b). People *within* organisations naturally modify their behaviour and decisions to reflect their context and role, but nevertheless a decision is reached through the thoughts of a single individual or a group of individuals, not by an organisation as an entity. Identifying the influence of single people may sometimes be beyond the resolution afforded by our sources of information, but nevertheless we can perhaps locate some places where individual voices are evident, along with their human biases.

5.1.12 FOUNDATION AND INITIAL SCOPE

The EC's decision to initiate EDL/Europeana appears to have arisen from its own internal motivations, brought into focus jointly by the potential of TEL and the perceived threat of Google Books. The value it sought was clear – to "facilitate access to and use of European digital content" (European Commission, 2005b) and so boost the digital and creative economies whilst strengthening the idea of a European cultural heritage. But how was the decision to press ahead with EDLnet arrived at?

A number of factors seem to have made it easier for the EC to make this step. Importantly, it appears to have been persuaded of the value proposition already – the ambitions to boost the creative economy and increase social capital came, after all, from the EC itself and motivated the eContentPlus programme that ran from 2005. Its own practice of putting out funding calls for research/pilot

projects then made it easy to invest in EDLnet, itself amounting to a pilot project, to establish the viability and enthusiasm for the idea.

5.1.13 INGESTION AND AGGREGATION

In both its motivation and its leadership, then, EDLnet followed on from TEL as a sort of "TEL plus archives and museums", yet it took a very different approach to content ingestion. Whereas TEL/EDLproject ingested directly from the national libraries and provided them with a standalone OAI server for this purpose (Fuegi, 2008; TELplus, 2008), EDLnet appears to have launched with an in-built assumption that its content would be primarily supplied via aggregators. This approach helped to control (and distribute) costs, as well as helping to develop partners that could advocate to and on behalf of their contributing institutions. Its benefits notwithstanding, this architecture was not the only possible arrangement, and there were potentially costs as well as benefits, for example in building relationships of trust directly with content owners, or in the quality of data that might reach Europeana.

Clearly, however, the practical challenges and cost of ingesting from potentially thousands of varied sources made a strong enough pragmatic case for aggregation, despite the potential downsides. Europeana did initially make arrangements to ingest directly from some larger institutions, but the balance progressively shifted towards working with aggregators based on domain (e.g. museums, audio-visual archives), or geography (predominantly national aggregators). The CCPA launched at the end of Ev1.0 appears to be in part an effort to ensure that relationships with partner organisations remain strong.

5.1.14 IDENTIFYING STAKEHOLDERS

Verwayen and colleagues identified four stakeholder groups in the business

planning process: end users, partners, policy makers, and "the market". The

decision to focus specifically on these groups is fundamental to the entire

strategic plan, because it sets the parameters for the sources of value considered

within the overall proposition and also highlights which parties Europeana is

targeting for the resources most important for its success. With stakeholder

identification so important, it is useful to understand how it was achieved.[156]

Verwayen recounted how the stakeholder groups used in the plan emerged out

of discussions with Cousins and Collier, but noted some reservations: "I still

think [they're] a bit unclear. For example the developer community [...] also have

an interest in this. [So] I won't say that these stakeholders are definite ones but it

seems to work alright for now". He acknowledged that a fifth group is, perhaps

erroneously, not represented in the business model, namely the Europeana office

itself, observing: "You do develop a certain kind of DNA as an organisation,

attract a certain type of people who have a certain type of opinion and it

becomes an entity on its own, and you have to also acknowledge them."

In the first iteration of a business plan (EuropeanaNet WP1 *et al*, 2008), end

users were identified as the most important. By 2011, though, Verwayen was

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[156] It is also interesting to note the stakeholders that the European Commission itself identified, besides (presumably) general end-users. Martinelli pointed to the members of the various advisory groups, the High Level Expert Group, Member States Expert Group and Comité des Sages, amongst which were representatives from "on one side cultural institutions of different types, to the other side publishers...the scientific [...] research community, and legal experts" together with rights agencies and, intriguingly, Google itself (Martinelli, 2012). The profile of this group suggests an idea of stakeholders that is slanted towards parties that have something to input or something to lose. Those parties where the value might ultimately be created or experienced (such as developers and consumers) are not in evidence.

talking of the partners, the cultural content providers, being the central stakeholder from the perspective of serving their needs.

When interviewed on this point the chair of the Council of Content Providers and Aggregators, Nick Poole, cautioned that the four stakeholder groups may have had limitations upon their usefulness. To Poole the concept of "users" is particularly problematic:

> End-users will mean a spectrum from co-creators, for people who are
> into participatory culture, all the way through to my mum, who wants
> a heavily curated experience [...] If you sit Europeana at the nexus of
> those value propositions, it's almost impossible to do the right thing
> [...] They're necessary in terms of business planning, but what they
> don't lead to is a clear, singular focus for what the actual service is
> supposed to be doing. Which means, as in all things, that you have to
> make choices. (Poole, 2011)

Content-providing stakeholders themselves may not see users as their primary customers, either, and Poole suggests that for them "the customer is *not* the end-user [...] the customer is actually the political will to do something about digitis[ing] cultural content".

5.1.15 EUROPEANA AS DIGITISER, DISTRIBUTOR OR ARCHIVE?
Early documents appear to indicate that the vision for Europeana initially emphasised the digitisation of media as much as its distribution. In the event, whilst targeted digitisation formed part of some contributing projects, far greater emphasis and investment was given to the aggregation and distribution of metadata. The reasons for this are not entirely apparent, but over the same

period the challenges for digitisation and digitised media changed in character for both technical and economic reasons. The rapid growth and commoditisation of cloud storage transformed the storage and distribution of large volumes of media, whilst the process of digitisation itself was influenced by commercial developments – the Google Books programme itself, and partnerships with companies like Ancestry, Microsoft and HP, all of whom have established relationships with UK cultural heritage organisations (and others) in recent years for the digitisation of their collections. In some cases, the focus has been on rapid "good enough" scanning of masses of content, in others upon high quality digitisation of smaller quantities of high value material. Thus a commercial imperative has penetrated much digitisation, and it is arguable that for Europeana to have attempted to insert itself into this evolving market would have been a mistake. Regardless, having set upon a course of increasing access to cultural heritage that was already digitised rather than prioritising the creation of new digital assets, Europeana's most important role became distribution, spreading the data that it held through as many channels as possible.

Late 2011 saw a twist to the story, with digitisation re-emerging as a priority within the Commission. The Comité des Sages report of January 2011 had expressed both the urgency of further digitisation of culture, and the importance of the public sector in achieving this:

> We are of the opinion that the public sector has the primary responsibility for making our cultural heritage accessible and preserving it for future generations. This responsibility for and control over Europe's heritage cannot be left to one or a few market

players, although we strongly encourage the idea of bringing more private investments and companies into the digitisation arena through a fair and balanced partnership. Some €100bn will be necessary over time to bring our complete heritage online [...] We think that the benefits are worth the effort. [Comité des Sages, 2011.]

The Commission followed the lead of CdS report, and in a new Recommendation (European Commission , 2011b; European Commission , 2011c) urged action from Member States to increase their efforts at digitisation by encouraging public-private partnerships, following new guidelines on fairness; to enable the legal conditions to enable in-copyright material to be digitised on a large scale; and to form strategies for and remove impediments to long-term preservation. The Recommendation "invites Member States" to:

Make 30 million objects available through Europeana by 2015, including all Europe's masterpieces which are no longer protected by copyright, and all material digitised with public funding. (European Commission, 2011b)

Public funding for future digitisation should be conditional on the accessibility of the digitised material through Europeana, and existing metadata [...] should be widely and freely available for re-use. (European Commission, 2011c)

The new Recommendation followed up that of 2006 and reflected changing attitudes at European level over the intervening years. The launch of Europeana, the EC's Orphan Works Directive (European Commission, 2011d, 2011e), and

especially the report of the CdS (Comité des Sages, 2011) were all identified as having been significant in formulating the new approach, along with the shrinking cost of digitisation (European Commission, 2011c). These factors persuaded the Commission of the economic justification for digitisation and for encouraging public-private partnership under conditions conducive to cross-border public access. At the time of writing it remains to be seen whether Europeana's mission will expand to include it acting as an archive for digital media (not merely surrogates). Verwayen was sceptical that this would transpire, but Jan Molendijk, Europeana's Director of Technical Development, expressed confidence that Europeana's existing architecture would be adaptable should it be required to take on such an expanded remit. It would inevitably mean expanding physical capacity (with a financial cost), but this should otherwise be straightforward with the third-party hosting arrangement currently in place. The decision is open, but even if its underlying vision remains unaltered it remains possible that Europeana might profoundly alter its emphasis with a shift towards digitisation and preservation. For now, suggested Molendijk (2011), Europeana's concern with various activities involving user generated content (from My Europeana to the Great War Archive) constitute a "toe in the water" providing some insights into the challenges of archiving content.

5.1.16 LICENSING AND PUBLIC DOMAIN

Europeana initially prioritised the public-facing portal, but by the start of Ev2.0 APIs and open data had moved into the spotlight and were the focus of much of the investment both technically and in terms of stakeholder outreach. In fact, from the very first records of the Commission's ideas of a European digital

library, the archives indicate that providing access to the data was part of the strategy, although it had a much lower profile than did the portal through much of the EDLnet project. The decision to create APIs was in that sense built into Europeana's mission, but putting it at the centre of the "distribution" strand was a significant step. A significant influence over both strategic and implementation questions around the API was the uncertainty over the licensing of metadata, which constituted a major risk to the value proposition of an API; for without the ability to offer a large dataset for use by non-partners, (including commercial bodies), a Europeana API would not be able to open up the economic or social value that was promised by Europeana's overall vision and the Strategic Plan.

The decision to invest effort and reputation in its data distribution channels long before the 2011 Data Exchange Agreement was settled then indicates something about the willingness of Europeana's management team to confront uncertainty. The Strategic Plan shows that engagement with the open data community, Wikipedia and outside developers was seen as being critical to success, and this required its data to be credible in terms of its openness as well as its quality. Perhaps, then, the risk of failing to invest in data services was too great *not* to proceed even whilst the licensing situation was unresolved. In Verwayen's words, "I think [the API work] was a necessity. Here in this office nobody believed in [the portal] any more". Whether the calculation had been made within Europeana that its data providers were likely to accept a CC0 dedication on their metadata at a later date, or whether there was simply a readiness to take a gamble on this issue is hard to determine.

The risks of suffering resistance from content providers had perhaps been reduced by a long consultation process, which allowed Europeana to gauge attitudes, adapt its plans in response to them and also to prepare minds for the necessary changes. In this way it was possible to steer the debate and provide a positive mental framing (Beach & Connolly, 2005) by presenting the discussion in terms of broadened opportunities rather than a *faît accompli* that content providers should be worried about. This aside, it is also clear that as Europeana engaged more and more with the Open Data community and the Linked Data movement between 2009-11, it had more and more to lose in terms of reputation and the capital already invested, and it is plausible then that it would tolerate considerable risk in order to further a nascent relationship with a portion of the "market" stakeholder group that was gaining in importance.

By the end of Ev1.0, then, it was clearly necessary to attempt to make the shift to an appropriate licence. As Verwayen and collaborators articulated the predicament:

> [Europeana had] successfully proven the value of its supply-led business model in aggregating massive data sets from all domains across 32 countries. But to be able to achieve sustainable success in the crowded content arena of the Internet, Europeana [then needed to] move to a demand-led model, positioning itself as a distributor of data and facilitator of digital heritage R&D in accordance with its Strategic Plan. (Verwayen, Arnoldus, & Kaufman, 2011, pp. 2–3)

In the psychology of decision-making the "sunk cost trap" is well understood (Hammond, Keeney & Raiffa, 2006; Beach and Connolly, 2005), and it may have

played a role both in the development of Europeana's APIs and in the move to the revised DEA. Parties that have already made an unrecoverable investment are reluctant to see it fail and are inclined to make further investments in order to justify the original "sunk costs", even if this is rationally unsupportable. A certain amount of investment had already been made in the Europeana API before it was explicitly placed at the centre of the strategy, and whilst the question of data licenses had not been ignored,[157] around the time of the plenary meeting in November 2010 it became apparent that in order to participate fully in what is termed the "Linked Data project", it would be crucial for Europeana to offer its metadata with as few restrictions as possible.[158] The investment of effort and, crucially, of reputation would have made it psychologically difficult to retreat at this point. Equally, by introducing a revised DEA at the end of Ev1.0, Europeana might have played off the "sunk cost" effect upon the decision-making of its content providers, because the many organisations that had already "invested" their content in Europeana might have found it more difficult to decide to give up this investment and leave than they would have found it not to join in the first place. That being said, the future potential of the investment – indeed the fact that the move was essential to deliver the aims of the strategic plan – suggests it may be inappropriate to consider Europeana's decision in terms of the "sunk cost trap".

As both an aggregator with a need to bring content into his own portal (Culture Grid), and (as Chair of the CCPA) a representative of the content provider

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[157] Author's observation, EDLnet WG3 meeting, INA, Paris, 3-4 March 2008. From spring 2009, Europeana v1.0 also included an activity in WP1.2 addressing the licensing of data.

[158] Author's observations, Plenary Conference, Amsterdam, November 2010.

stakeholder group, Poole offered another perspective on the DEA. He noted some criticisms of the decision-making process and the decision ultimately reached that made CC0 part of the DEA, arguing that Europeana became a "Trojan horse for the open content/open rights lobby" that made claims of which he was dubious. "One assertion is that for something to be linked open data it must be public domain/CC0", a proposition that he was "pretty sure is not true" (Poole, 2011). The consultation that began a year or more before the DEA was launched consequently "[was not] on the side of the sector [...] it's been over the assertion of an untested hypothesis [...] Now is when the consultation really happens". Poole described the DEA as "the first time people have had to make a decision [...] to sign away something", namely the right to limit access to and reuse of their metadata and the opportunity to make financial arrangements around this. It highlighted the tremendous differences between domains, because "a bibliographic record is an assertion of fact but a museum record is a narrative assertion that may change over time"; this difference, believed Poole, helps to explain the different attitudes of libraries and museums. The decision, then, to require a CC0 attribution for all data was perhaps riskier in Poole's view than in others', because it remained hard to predict how many content partners would consent to it.

Poole's concern was expressed three months after the DEA was announced in September 2011, and may have been partially neutralised by the proposal, also in December 2011, of an amendment to the 2003 directive on the reuse of public sector information (European Commission, 2003, 2011f). Whereas the 2003 directive explicitly excluded cultural organizations, the amendment would bring

museums, libraries and archives into the fold. Any data in the public realm (such as any material on public websites) would by default be included, and the revised directive would state much more strongly that charges should be avoided or based on marginal cost; that the licence should be open and encourage reuse; and that data should be in a machine-readable form that enables interoperability. The effect of these modifications, if adopted by Member States, would be to make the Europeana DEA a matter of indifference, because it would oblige museums, libraries and archivess to release their data under a public domain licence or similar, other than in exceptional circumstances. If it could thus defuse any objections to the DEA, a modified PSI directive may then help to avert an exodus of the sort that Poole feared could it may provoke.

SUSTAINABILITY

Before attempting to offer an evaluation of the prospects for Europeana as it stands, a short way into the Ev2.0 project, we need to step back and see what lessons can be gleaned for our model from our exploration of the early years of Europeana.

5.1.17 EUROPEANA AND THE MODEL

The term "sustained" as it is used in this thesis indicates quite simply that a resource continues to yield value in line with its intended purpose. We can consider this *empirical sustainability*. But we argue that there is also a state of perfect, *theoretical sustainability* when the value it is *in principle* capable of yielding would be deemed sufficient to justify resourcing it – that is, when objectively the value proposition validates the required commitment of resources. The cycle model we derived from this draws a connection between value and resources in the sustainability of a product, but allows for lacunae

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between empirical and theoretical sustainability to exist. Our research seeks to understand whether organisations do in fact translate their understanding of value into decisions about resource allocation. This in turn will help us to understand when and why gaps may appear between empirical and theoretical sustainability.

Although sustainability can only refer to a digital service/product *after* it is built, by the time it graduates to live status it has been profoundly influenced by its prehistory, and also by the "settlement" that stakeholders have reached with it at that point. Consequently we are interested in the decisions that influenced how the product was built, as well as those that influence the support available to it once "complete". Europeana has shed light on the process of bootstrapping a partnership as well as building a product, and insights into the early days of a live service during a time when it was striving to put together a resourcing strategy for the rest of the decade. Given this, can we now address a simple question: does value really affect sustainability? A set of observations will help us on our way.

5.1.17.1   Resourcing stakeholders are owners

In simpler projects, the ownership of the product lies in the same place as the decision over whether to commit the necessary resources to sustain it. With Europeana, however, there is no single source of vital factors for success, and no single owner. There are instead three recognised resourcing stakeholders – politicians, content providers and market players – and one less acknowledged one – the Europeana Office – that each provide resources without which the core idea of Europeana could not be realised. Formally, ownership lies with the

Commission, which is responsible for Europeana's existence and setting its fundamental aims. Arguably the Europeana Office also has a special claim to guardianship, acting as both a cheerleader and as the executive arm of the partnership, and the individuals working there perhaps have more personally at stake in its success do than most other stakeholders. But if ownership is influence (including the ability to walk away), then there is no single owner. Consequently, the value that each resourcing stakeholder might realise depends not only upon what it invests itself but upon the resources that the others must supply.

5.1.17.2 More complex resourcing makes for more complex value

In the cycle model presented in Chapter 3 we consider value to be essentially the output of the "product", but we can now see that output value may merely be the value to the product's ostensible owner or champion, and that those stakeholders providing resources to build and maintain the product each also have a claim to "ownership". The value perceived by them may vary considerably but is just as important to its continued viability, which the Europeana case study shows clearly.

It is apparent that with multiple core stakeholders the Value/Resource equation becomes extremely complicated to resolve even at an empirical level, if it is possible at all, and assessing the theoretical sustainability of the project is still trickier. It is particularly difficult to interpret the value side of the equation because the yields (anticipated or realised) can often be rather intangible and attempts to measure them patchy. The best one can hope for is to gain insights into the actual assessments of value made by the people that matter, evidenced

by their statements and decisions, and to ask whether these assessments have neglected to consider anything that "should" have been significant to those parties. In the context of our equilibrium, "the people that matter" are in all cases resourcing stakeholders. The value proposition to non-resourcing stakeholders – in this case, most end-users – should find its reflection in the value proposition to resourcing stakeholders. This is characteristic of social endeavours, where one stakeholder group represents the needs of another.

The fact that vital resources come from multiple directions means that it is not possible or appropriate to calculate a "total value proposition" to balance against the total resource requirements. Firstly, the yield of value that a party is willing to accept for a given resource cost (an exchange rate) has a close relationship with opportunity cost, because that reflects what else could be done with those resources in a zero-sum scenario. This exchange rate can be very dynamic, depending in part upon the size of the market for alternative uses for the resource, or even the activities of other stakeholders.[159] Secondly, benefits to one stakeholder group might actually in themselves be seen as costs by another stakeholder group.[160] Third, and most importantly, what is critical to the sustainability of the product is the cost/benefit equation within *each part* of the network of (resourcing) stakeholders, and if the value proposition is weak in one

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[159] See Chapter 6 for further discussion of opportunity cost.

[160] For instance, according to Poole, reducing restrictions around the reuse of metadata gives some content providers concerns around the loss of control and authority and of potential revenue streams, but without it the value proposition to the core funders (and others) cannot be fully realised. Conflict of interests might also apply within stakeholder groups, for instance between members of the "market" segment, who might see anything that benefits their competitors as a cost to them. An example is given in the "POPSIS" report undertaken by Deloitte for the EC, which reported cases where existing re-users of public data lobbied or even threatened litigation at the prospect of charges for that data being *lowered*, as this would increase competition (Deloitte Consulting, 2011, pp. 83-4).

area the imbalance might cause a bottleneck on resources dependent upon that group.

What we have seen (by working through the project archive, and by interviewing key actors in the project) is that for Europeana, there is no simple measure of "total resource requirements" either. In other scenarios, a generic resource like finance might be sourced interchangeably from several stakeholder groups and used to secure specific factors. In this case, however, many of the required resources are very specific factors and cannot be secured from alternative sources. Only finance, as a generic resource, could in principle come from anywhere.

The lesson here is that even a product's own direct stakeholders can constitute a dynamic and somewhat unpredictable environment; nothing less than an ecosystem of value creation and destruction. If decisions to contribute resources that sustain the product depend upon assessments of value, then increasing complexity can make those decisions more difficult for each resourcing stakeholder.

5.1.17.3   Building a brand helps to tackle the fear of the unknown

It follows from the previous observation that reducing the risks and uncertainty associated with complexity is an important objective, for instance by improving the prediction and measurement of inputs and outputs or through reducing the dependency of value propositions upon other stakeholders. Small disruptions to the balance between stakeholders might have domino effects upon confidence that threaten the partnership itself.

Europeana faces this situation and has sought to address it in part through building a brand profile for the project that encapsulates a common cause. Jones (2005), observing upon the significance of brand equity, points out that an enterprise's success "depends on securing key stakeholders as resources for the firm, and aligning them to the strategic thrust of the organisation" (p. 21). In much the same way, Barnard and his followers (Barnard, 1938/1968; Scott, 1990; Simon, 1978b) have argued that the aims of organisations and the individuals that participate in them must become aligned for them to work "efficiently": there must be a two-way process of the "firm" influencing and being influenced by its staff and other stakeholders.

What is equally important to observe from the evidence presented here, is that the brand can act like a warranty for the whole partnership, allowing a level of trust to build up without the need for peer-to-peer relationships between all of the partners (for instance, between the EC and the content partners). The brand becomes pinned to an entity (which in this case is arguably the Europeana office), and relationships between stakeholders may be mediated via this (or the various workgroups). Despite the difficulty of identifying an "owner" for Europeana, we can see that its core staff or office have an essential role at the heart of the brand, acting as a guarantor in the middle of the network and providing a degree of assurance to all parties that their involvement will provide a return.

Building the brand is an iterative process of building trust, then, in which resourcing and value must boot-strap each other. This is Collins' fly-wheel, seen in Chapter 3, which gathers speed slowly but builds a compelling momentum

(Collins, 2005). The momentum may not be irresistible, of course, but we have seen in our case study how Europeana has attempted to start to build it.

Europeana's brand equity, with its four stated stakeholder groups, is clearly the focus of a variety of efforts from the Europeana office. Although it is difficult to assess its current state, the partnership appears to be well enough established to consider that the foundations for sustainability have been laid. But its complexity still leaves it vulnerable to changes in the environment or within its stakeholder community, and the decisions that the resourcing partners must make over the coming years will be crucial.

5.1.17.4 Value and resource are two sides of the same coin

The concept of "value" and of "resource" often appear to be hard to distinguish from one another in the context of the transactions between partners in Europeana. Not only is one proposed in exchange for the other, but the same article can be seen in both ways even by the same party. For instance, where participation in Europeana as a content provider gives a museum access to new funding opportunities, this is part of the "value proposition" to that museum, but can equally be seen as a resource that it can invest elsewhere – after all the only value in money is in what it can enable. A further example: for an enabler like an aggregator, the same content that comes in as a resource (=input) is passed onto Europeana as an output (=value). The value creation here is not direct, but is passed back in another resource/value transaction as Europeana helps the aggregator to fulfil its purpose.

5.1.17.5 Value does relate to sustainability

This case study offers strong evidence for how the value proposition can be crucial to securing the involvement of resourcing stakeholders. Value has been central to discussions with all of the partners and strongly influenced the strategic plan, and for better or worse the shape of the service reflects this. The investment made in the portal, for instance, does not have universal support for its own sake, and yet it is important both for Europeana's profile and to satisfy the priorities of the European Commission. Conflicts between the value sought by different parties, too, have shaped the service but in other cases might fatally undermine it; either way, value is intrinsically linked to sustainability.

5.1.18 EUROPEANA'S PROGNOSIS

If achieving sustainability means reaching a judicious balance where resources are committed to a level appropriate to the value that they can yield, then assessing the sustainability of Europeana is made more difficult by the fact that its multiple resourcing stakeholders place value upon different aspects of the outcome, and yet, as we have just discussed all of these parties require the commitment of all the others in order to realise any value at all. It is a classic partnership, in other words.

The evidence would suggest that early work to build trust and commitment to a shared vision has been encouraging but not without its controversies, and some of the decisions that have been arrived at may yet turn out to have negative consequences for the participation of some key stakeholders. Haskiya observed (2011) that museums have proven to be the most difficult heritage organisations to persuade of the necessity of the DEA. Very few have withdrawn their material, but it may prove harder to recruit new partners. The security of the supply of

cultural heritage content itself is therefore far from guaranteed if potential content partners are deterred by the DEA or if they perceive other costs or insufficient value being returned by Europeana. Equally plausibly, however, the volume of material in the index could grow substantially if the concerns about the DEA turn out to be minor or are neutralised, for instance by a revised PSI directive from the EC, and as partners see evidence of the value that the new licence makes possible.

The biggest threat to participation by some partners, however, may not be the DEA but uncertainty over costs and benefits, and on this front there are some positive signs. A clear overall vision has been articulated, meaning that whilst the precise form of the service a few years from now remains vague, partners can collaboratively develop these plans in the light of that shared strategy. Doubts over licensing models, the risks of open data and APIs, and the plausibility of the value proposition will be progressively crystallised or else dismissed by experience of the live service, and perhaps by political and legal actions at European level, which are an extremely powerful tool working in its favour.

The financial position of Europeana, itself another source of uncertainty for various stakeholders, also appears to be relatively secure at present. The operation has thrown in its lot with the Commission (and to a small degree with Member States), having effectively ruled out any form of charging either for users, content contributors, or commercial partners. Subject to a decision due from the EC in 2012, its core funding should be secure until 2020.

Like any venture, Europeana's value and the challenges of running it are also subject to the environment outside its influence. Some of these have proven

fairly predictable – for instance the steady reduction in digital storage costs –
and some have the character of "known unknowns", for which some preparation
can be made – for instance, the likelihood that novel environments for
Europeana content will appear, or that a new social platform will become
popular. The "unknown unknowns", however, always pose the possibility of
disruption, whether they come from technology, the economic environment,
political shifts or social change. Europeana has spread its investment, building an
end-user experience (the portal), a piece of infrastructure for "digital Europe",
and a network of content providers and other interested parties, all based on the
same underlying principle but with a diversity that puts it in a fair position to
accommodate the changes that may come, although they cannot guarantee its
long-term viability.

We have evidence to conclude, therefore, that the sustainability of Europeana
would appear to depend upon it keeping all of its resourcing stakeholders on
board by delivering what they need whilst retaining a strong overall vision that
all can support. Finding this balance is the true challenge of such a partnership,
and it can be difficult to build the necessary commitment in the early years
whilst there is no proof that value creation is likely. But Europeana also faces the
challenges of maturity in the coming period, where the Commission in particular
will expect to see its investment proving its worth, a question that concerns not
merely value creation but definition and measurement. Consequently, the
project's most important challenges in Ev2.0 are likely to be value measurement,
the development of a strong brand (within and beyond the network), and

building a strong community of partners all of whom feel deeply involved in determining its direction.

5.1.19 EUROPEANA AS ENVIRONMENT

We have remarked on the fact that, like any enterprise, Europeana is subject to environmental influences and threats beyond its control. Interestingly, and to a degree that is perhaps unique amongst digital cultural heritage initiatives, it is also becoming a part of the environment that museums, libraries and archives cannot ignore, influencing their behaviour just as Google, Facebook and the like have done before (albeit to a far lesser degree at present). It has always been a part of the "market" (in Lessig's (1998) sense), being an agent with which cultural organisations could engage in a transaction, but this role is growing as European funding for digital heritage becomes attached to participation in Europeana (and at a time when alternative sources of funds are narrowing), and a market participant becomes a qualitatively different regulator of behaviour when it is no longer possible to make a good decision without considering it. We can also see how Europeana has started to change the conditions that it operates within itself. Lessig observed that constraints can shift in nature, for example norms can become embodied into law, or an architectural constraint on an actor's behaviour can be dissolved by an innovation or nullified by a change in the actor's scale. This is illustrated by Europeana which, through direct advocacy and the example of its experience, is catalysing change in information policy and copyright regulation; thus, legal and normative barriers being are dealt with at a European level.

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The problem that we explored in Chapter 2 - of the production and support of digital heritage in a rapidly changing context – was developed into a conceptual model in Chapter 3, built around the core ideas of value, resources and decision-making. Europeana and the previous case study at the Museum of London were structured around these concepts and have thus brought into focus a number of complicating factors that, in those earlier chapters, we had hypothesised might be significant: the importance of stakeholders for both resourcing and a full understanding of the value a product is creating; the challenges of building consensus and reaching decisions; the partitioning of resources, whether this be explicit or unconscious; the importance of information and the difficulty of making decisions when it is limited. Thus informed by the case studies, we are now in a position to return to the elementary model offered in Chapter 3 to see whether it can be made more accurate and useful as a result.

6 A POSITIVE MODEL OF SUSTAINABILITY

INTRODUCTION

As the conclusion of Chapter 5 reflected, we are now in a position to return to the model introduced in Chapter 3. The model (recapped more fully below) positions a digital product as part of a cycle along with the resources it requires and the various forms of value it enables, all of which depend upon a series of decisions or choices to be made at many points in this cycle. These central notions of value, resources and decision-making guided us through two major case studies, which in turn provided fresh insights. In this chapter we use these insights - together with some new ideas imported from a variety of fields - to identify three new concepts that help to describe and explain the gaps in the model where value, resources and decision-making alone are insufficient. The three new ideas, indicated earlier in this thesis, revolve around actors (the parties involved in digital products in some way), context and regulation (in the sense meant by Lessig), and frictions (the factors that can interfere with balanced decision-making and optimal resource allocation). The cycle model is revisited to fold in what has emerged through these three ideas, enabling it to be applied more realistically to the world in which museums actually exist and strive to build and sustain digital products. The chapter concludes by returning to the example that began and inspired this whole inquiry, Making the Modern World Online – quite literally a return, as the story is updated with the situation as it stands in late 2012, and a brief interpretation is given of some of what we saw in that project using the tools now at our disposal.

The cycle model that we proposed back in Chapter 3 (seen again in Figure 12) provided a way of looking at the dynamic between a museum's digital product or activity, the value it outputs and the resources required for it to continue to do so, with implicit or explicit decisions and evaluations required at various points. It proposes that, when the parts of the cycle are in balance, value and resources should in effect perpetuate one another, but recognises that various considerations might disrupt this.
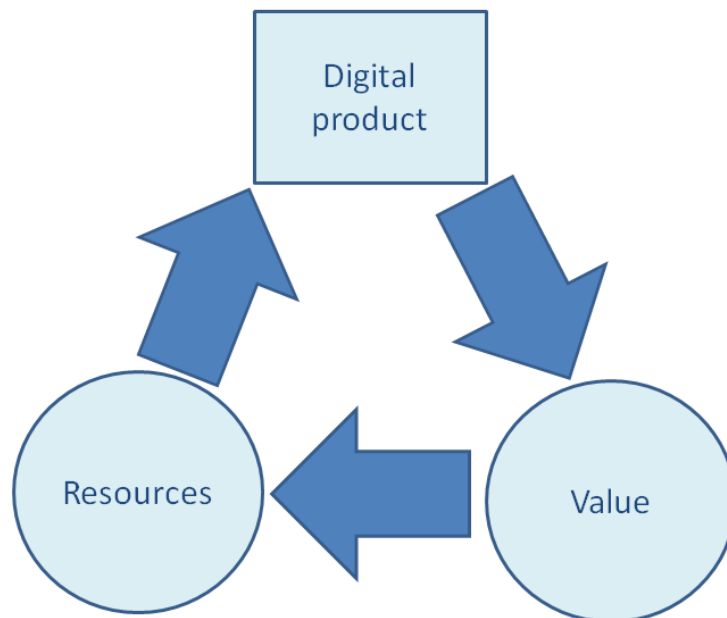
Figure 12: The sustainability dynamic

The model is therefore founded upon an assumption that value outputs are linked to resource inputs, and an assertion that, for a system to be considered "sustainable", the two should be proportionate. If either of these tenets is rejected then the model would be an inappropriate starting point, but otherwise as a logical expression of these starting points it is offered not as a testable

theorem, but rather as a conceptual framework for analysing various decisions and how value and resources enter, circulate in and leave the system. The model is neither predictive nor prescriptive, then, but descriptive; nevertheless it was acknowledged that it may be too simple for the fullest description of digital products in our case studies and elsewhere.

The core concepts of value, resources and decision-making were subsequently used to guide the two major case studies presented in Chapters 4 and 5. They proved to work well for the analysis of the processes seen in those studies and it was possible to see clear connections between each concept, and how decisions centred around value and resources do ultimately have a significant impact upon the prospects of a digital product. But whilst it suggests how the process should operate, the cycle model allows for the possibility that distortions might interfere with sustainability, and Chapters 4 and 5 did indeed show the effect of certain complications. One might group these complications into three categories. Firstly, there are the various actors – people and organisations – that have a stake in or influence over a particular museum or partnership and its digital product, and who in some cases are making key decisions that affect sustainability. Secondly there is the context in which digital products sit. This can introduce disruptive pressures from outside that influence the value proposition or the availability or cost of resources (to positive or negative effect); but the environment also provides the regulatory context – in the sense that Lessig employed the term – that governs decisions. Thirdly, a variety of what we have termed "frictions" can exist, in particular connected to the problem of making decisions in the face of risk and partial information, and the economics of the

real world. These can interfere with efficient allocation of resources, or bring about sub-optimal decisions which divert value or resources in or out of the system without proper justification. We now address these three sources of complexity in turn.

THE IMPORTANCE OF ACTORS

6.1.1 ORGANISATIONS, PARTNERSHIPS AND OWNERSHIP.

The case studies each demonstrate aspects of the question of ownership that we touched upon first of all in the introduction to stakeholder theory in section 3.2.1. At MoL things were relatively straightforward: the museum was the owner of both the user-facing front ends and the infrastructure serving them. It owed responsibility both to the galleries' key funder (the HLF) and to MoL's public; but ownership of the product clearly sits with MoL itself, albeit with the caveat that its actions are ultimately aimed at supporting a public-serving mission.

At Europeana the situation was more complex. How would a relationship work between the myriad members of the partnership, for whom Europeana was an additional activity, and the group of people sitting at its heart and acting on its behalf, and who both responded to its needs and helped to shape its agenda? How did Europeana distinguish between the needs or desires of the group of individuals working day in, day out in the office in the Hague, and those of its stakeholders? It is difficult to be certain from examining the archives exactly who was responsible for some decisions, but combined with the evidence from interviews it seems that, however thorough the consultation and discussion within workgroups, with the Commission and the wider network, many decisions ultimately happen within that core team, some at the level of

developers and some amongst the senior management team, with occasional escalations to the board.[161] In effect, then, the Europeana Office acts as the owner in making many decisions, but only insofar as they have been delegated by various stakeholders and after extensive consultation, and with the Europeana Board having a controlling oversight. The "principal client", as Verwayen described the Commission (Verwayen, 2011), still cannot be considered the outright owner because decisions need somehow to balance the needs of (at least) the four stakeholder groups identified in the business plan. As Verwayen observed, "the four stakeholders [...] have quite different value propositions that they're looking for [...] One of the big challenges is to align those value propositions as much as possible." Sitting in the middle of this, the Europeana Office may at times need to adjust the priority that it gives to one group or another, for example from end-users towards the content providers, as Verwayen suggested in 2011. A decision about how decisions would be made – a "meta-decision" – is telling about where real power and ownership lie. All the more interesting, then, that the staff of Europeana are not yet included as stakeholders in the business plan.

We suggested that, ultimately, resourcing stakeholders are the owners of a product to the degree that it depends upon them, but conflicting priorities may make it difficult to secure the best outcome for all parties. In Europeana, the DEA controversy appears in the end to have passed without the loss of many content partners, but exemplifies the dilemma.

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[161] In interview, Jan Moelendijk supported this suggestion for development work. David Haskiya is the product owner and acts as a representative of the stakeholders, putting together "stories" from the functional specification agreed by the technical working party. These stories, discussed with the Moelendijk's development team then form the basis for their work plan every few weeks (Moelendijk, 2011).

6.1.2 ACTORS AS ECONOMIC AGENTS

Economics has been an undercurrent in much of the discussion in this thesis, and in a sense the theoretical idea of a product in sustainability "equilibrium" could be seen as a counterpart to the microeconomic theory of supply and demand, wherein the production of a good will reach a balance between the cost of its production and the price it commands, which in turn reflects demand. But simple supply and demand curves do not adequately express the complexity of the roles of multi-stakeholder markets in which value rather than money is the medium of "commerce". We can, however, use an economic perspective to ask further questions about the participants that we have seen in the case studies.

We might ask first, are museums that build digital products actually producers? As social enterprises that seek value rather than an economic return from what they produce, the answer is both yes and no. Museums act as producers by creating and offering products to end users, who gain value from them. The return to museums is in part this value experienced by users – value-by-proxy – and this helps to justify the product; museums thus also act as consumers-by-proxy. There is another way in which most museum products and services cause them to act like consumers: when there is no economic return on investment (ROI), resources that are invested cannot be returned for reinvestment; consequently resource allocation decisions are made on the basis of *opportunity cost*, just as they are for consumers and unlike those often made by industry. [162] Opportunity cost is an entirely different calculation to ROI, subject to different

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[162] In the short term all investments imply an opportunity cost (although businesses may not always have to choose between alternatives, especially if they can borrow finance), but in the longer term in the for-profit sector there is an expectation that much of an investment will be returned and made available for alternative uses. Where investments are irreversible – sunk – they have opportunity costs attached.

influences and often more difficult to assess if only because of the huge variety of possible alternative uses for resources (especially generic resources).

And what of museum funders? Like museums themselves, funders choose between alternatives for allocating resources and typically do so in pursuit of social value and on behalf of a public audience; again we see them acting as proxies for consumers, but this time purchasing a service on their behalf rather than producing it – in Weisbrod's terms, they are a broker or "financier" (Weisbrod, 1998). Regardless, their resource allocation decisions are again based on opportunity cost.

Of our case studies, the Museum of London acted less as a consumer and more as a producer, albeit with itself as a principal client. The CIIM became significantly an infrastructure project, and a key motivation came from MoL's own plans for building on top of it and for using it to streamline internal processes. These efficiencies amounted to an economic return on investment by freeing up resources for other uses. Secondly, much of the funding for the project came from an external source and would not have been available to MoL for alternative uses. Instead it in effect sold to the HLF a value proposition: kiosks offering the museum's collections to gallery visitors.

The Museum of London exemplified the choices faced by museums investing in digital. With constrained finances and no option to borrow funds, MoL's decision to build and subsequently support the CIIM was made in the face of alternative ways of expending at least the internally-sourced resources. As Cathy Ross reported, when it came to throwing some of MoL's own money into the pot in order to achieve more than kiosks alone, "people didn't really want to give the

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go-ahead just in case [...] we wouldn't have money to do the pleasure gardens or something like that" (Ross, 2010).

Europeana offers an example of a more user-centric proposition, built with a fixed budget and therefore making choices about its priorities. These choices were heavily informed by its research into business and end-user requirements, but the questions concerned how best to use Europeana's resources rather than how large they would be overall.

Why is it notable when museums act as proxy consumers? There are several implications, especially when opportunity cost significantly informs resource allocation decisions. When making an investment that is expected to be recouped in due course there is uncertainty attached to the prospect of recouping the cost, but the cost may be predictable; however when an investment is made but no equivalent return is expected, its opportunity cost can have a much higher level of uncertainty attached.[163] This is because it applies not only to the (non-financial) return, but to the alternative uses for the resource: each one of potentially many alternative uses for the resource has its own estimated value, with its own uncertainties.[164] In other words, as well as uncertainty over value there is higher uncertainty over cost.

We would highlight two implications. Firstly, where museums build products in such a way that they return resources for reinvestment, the dynamic changes

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[163] See for instance Pindyck's work on uncertainty and opportunity costs in industrial and environmental settings (Caballero & Pindyck, 1996; Pindyck, 2007).

[164] Although a museum is likely only to recognise and consider a subset of alternative uses for its resources.

away from one of opportunity cost.[165] This is on the one hand a statement of the obvious – that reducing net costs is positive– but we can now also see that *greater autonomy* of resourcing allows us to avoid the uncertainties of opportunity costs. Secondly, to reduce the complexity of selecting between alternative uses for resources, they can be partitioned, as indeed they usually are within organisations. Allocating a quantity of money and staff to, for instance, exclusively digital projects reduces the alternative uses for those resources to a more manageable level. There are various ways to achieve this partitioning, and it is not without its own inefficiencies;[166] however it is one way of reducing uncertainty locally. This is consistent with Simon's notion of *bounded rationality*, which suggests that decision makers are able to act rationally but that there are limits upon the information they can access and process.

6.1.3 DECISION-MAKING AND ORGANISATIONAL SCIENCE

As far as it was possible to ascertain from the archives and from direct observation, the choices made within the Museum of London and Europeana were made in a way generally consistent with Simon's views that decisions in organisations are ultimately made by individuals – even if they are ostensibly collective (see section 3.1.5). Even where deep consultation was undertaken, as at Europeana, the information gained thereby was processed into decisions by a small number of people. But Verwayen also reported signs of the development of a culture within the Europeana office which, whilst not preventing individuals

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[165] The BMICE (2009) study remarked upon the importance of the efficiency savings enabled by digital technology in justifying many projects, requiring a whole-organisation view of the product and its impacts.

[166] As we discussed in "The internal allocation of resources" (3.2.2), control over resources within organisations is typically at least partly partitioned into, for instance, departments, projects, partnerships and services. Larger-scale allocations of resources are made e.g. to departments, which may lose some of the subtlety of comparing all activities organisation-wide but be considerably easier and with lower uncertainties attached.

from forming their own opinions, could nevertheless encourage a general alignment of objectives and consistency of thinking. This sense of institutional purpose, when individuals subscribe to it, should in Barnard's words increase the "efficiency" of decisions, making it easy for people to act in a way that is aligned with the needs and culture of the organisation.

The rationality of an individual is limited – "bounded" – according to Simon, and reflects the limits of their knowledge, their habits of thought, the institutional context and the framing of a problem. Frequently decisions must be made with very partial information:

> In complex situations there is likely to be a considerable gap between the real environment of a decision (the world as God or some other omniscient observer sees it) and the environment as the actors perceive it. [Simon, 1978a, p. 8]

Decisions between structural alternatives[167] would seem to be particularly dependent upon the judgement of individuals, especially given inevitably partial information, because whilst an automated process might calculate a quantitative answer, a qualitative choice about what sort of activity to engage in is unlikely to be amenable to such a process. At the Museum of London the decision to pivot the project into a new direction and develop a piece of infrastructure required the blessing of a number of people on various committees, but was driven by a few and steered through those committees by the persuasive power of Ross and Sussums. It was indeed a decision between structural alternatives based, not upon numbers, but upon experience and judgement.

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[167] That is, qualitative decisions *sec.* Simon. See section 3.2.3.

Digital products do not exist in a vacuum, and in Chapter 2 we looked at a number of aspects of their evolving context over the past 15 years or so. These changes can open up opportunities for new products or affect the value proposition or resourcing of existing products, and cannot be disregarded in well-balanced decisions regarding sustainability. Section 3.1.5 then introduced Lessig's modalities of regulation (Lessig, 1998) as a point of reference for understanding context, and we can now lean harder upon this framework to help our understanding of the case studies.

6.1.4 *REVISITING LESSIG: THE MODALITIES OF REGULATION AND DIGITAL SUSTAINABILITY IN ACTION*

Lessig's concern is chiefly with how behaviour can be limited or directed by outside influences; it offers us less for understanding the motivations *for* behaviour (although of course constraints can act in this way too, for example in demand from the market), but we can find these elsewhere, as in the stakeholder model we discussed earlier. His approach, however, can still be used profitably for describing the wider environment less deterministically, and the evolution of technology is a natural way into an exploration of how various forms of regulation have operated on the subject matter of this thesis and our case studies in particular.

Technological advances have often acted to break down what had once been architectural constraints on behaviour (because things that had once been impossible became possible), or else market constraints (by making certain options economically viable), but in doing so they have had knock-on effects. The leaps made over the last couple of decades have co-evolved with user behaviours

and expectations[168] but they have also repeatedly subverted legal and market constraints on a global basis (for example, peer-to-peer networks), and in enabling novel behaviours have thrown into relief the lack of strong social norms to govern them, leading to confusion over what is acceptable and battles over the need for new laws. We have already marked a resultant trend for changes to legal constraints around copyright and the regulation of cross-border activity.[169] In this technologically-based domain, then, we immediately see all four modalities of constraint bound together.

Working in the opposite direction to some of the proposed changes to IPR law, the growth amongst museums adopting open licenses (like Creative Commons) for their digital assets may be starting to act normatively, prompting more institutions to change the way they value the use of their resources, perhaps even to forfeit some revenue in exchange for the additional value they now perceive in wider usage – value is powerfully defined by social context and so susceptible to normative constraints, and one might hypothesise that for an organisation built around public value this will be especially true. Thus a social norm acting on the museum may result in changes to the legal constraints imposed *by* it.

In Europeana we saw legal, normative and market constraints interacting in this very question of the licensing of metadata and content. The project and its political stakeholders have shown an ambition to engage in market-altering activity by seeking to break down barriers to access for all types of users,

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[168] See "A culture in transition" in Chapter 2.

[169] See "The legal context" in Chapter 2.

encouraging the reuse of metadata with the aim of (amongst other things) stimulating the creative digital economy of Europe. The DEA (applying only to metadata) acts to this end as a legal constraint on the participation of content partners. However the content itself (the media) is not required to be licensed under Creative Commons-style terms; nevertheless there is still strong encouragement to do so, which we can see as an effort to construct a norm. But at this point there seems to be a clash between constraints. The plenary conference of June 2012 demonstrated this during a debate about the idea of a "cultural commons", to which digitised assets from Europe's archives, museums and libraries would be added and licensed liberally. The idea of such a pool of freely reusable material saw resistance not only from some content owners, but because of a perceived threat to commercial picture and film libraries should the market be flooded with free alternatives to their paid-for products.[170] Here we see a way in which Europeana could potentially lead museums in a market-altering (price-undermining) way, but may choose not to owing to the complexity of its stakeholder community's preferences. Nevertheless, in various of its activities (including the partnerships it has made with, for example, Wikipedia), Europeana is clearly working to strengthen open licensing as a norm, with potential implications for the market. Is it likely to attempt to promote legal constraints in this quest? Perhaps the wishes of its stakeholders hold the answer to this question, but Lessig (1998) also points out that in substituting one set of constraints for another of a different modality one must account for the full costs of the changed incentives or restrictions in understanding "[how] efficiently [it]

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[170] Author's observation, Europeana Plenary Conference 2012, Leuven, Belgium.

achieve[s] a given social end" (*ibid*, p. 686),[171] suggesting perhaps that to attempt anything stronger than shifting norms could be risky. But Europeana and its EC owners have pushed to change the legal constraints within which cultural organisations operate,[172] and given the proximity of Europeana to the law-making body, stronger action remains conceivable. In a further example of constraints clashing, Verwayen identified advertising as one source of revenue that Europeana would probably not pursue owing to its social unacceptability – a collision between the market and the social norms of the cultural heritage sector.

In the context of this study, at least, market constraints are more complex than simply reflecting the price mechanism. Firstly, as digital products are themselves items in the marketplace, their justification should be that there is a demand for them; yet as we have discussed the demand will often not be regulated nor measured by the price mechanism. We need to extend Lessig's idea a little to account for funders: as we discussed in Chapter 3, they act in a sense as a market to which museums "sell" the public value they will generate with the resources funders provide, and this market of funders is itself constantly evolving. Besides this, many other factors act as market constraints on the end-user demand side.[173] The market also naturally affects the availability and price of many factor

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[171] As different constraints can be correspond to different forms of value (see footnote 115), the substitution of e.g. a norm for a market constraint has similarities to the choices non-profit organisations make between pursuing mission-based value and profit, as discussed by Weisbrod (1998).

[172] i.e. the proposed changes around orphan works and public sector information. See 5.6.5, "Licensing and public domain".

[173] See 2.2.7, "Competition, co-operation and commerce".

resources: the advent of cloud computing, for instance, has led to a dramatic loosening of one market constraint upon many software-based services. [174]

At the Museum of London market constraints defined much of the demand (actual and anticipated), which was partly expressed through the settlement with the HLF. Justifying the live system in the long run now depends upon a combination of internal needs (the CIIM now being tied into the workflow of various departments) and "demand" for what it can deliver to front-end interfaces built on top of it, or indeed other uses like Europeana and Culture Grid. Value may be partly affected by external constraints, then, but the resource challenges the CIIM faces appear to be more internal. That is not to say that constraints are inapplicable, but the decisions about how to allocate resources amongst departments, including whether to retain development capacity within the web team, show no signs of being influenced by external factors. One might conjecture that, despite the professionalization of digital heritage[175] and the increasingly prominent role it plays in general museum discourse and in the expectations of funders, the senior management of museums like MoL have to date not subjectively experienced strong normative constraints to encourage them to treat digital activity as a core part of the organisation.

Decisions made by museums acting in the digital realm are always regulated by external constraints. Indeed, Lessig suggests that most if not all behaviour is regulated – limited – in this way. But, interestingly, Europeana also offers us another perspective: Europeana *as* a constraint, not merely subject to them. As it

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[174] See 2.1.7, "Technical context".

[175] See 2.2.5, "Digital heritage professionals: accepted at last?"

grows, so does the degree to which it becomes a part of the architecture of the web: like Google, an entity that museums cannot ignore even if they opt not to deal with it. This is not yet the case, and it might not become so, but it is interesting to consider that "Europeana as architecture" might in the course of time affect the behaviour and sustainability plans of individual organisations. One way in which this could happen is via the funding streams that carry the condition of contributing content to the project, with the concomitant conditions around licensing. It may be difficult to ignore these resources, but it remains to be seen whether that trickles through into changed behaviours or norms around opening up the content of museums. Another possibility is that Europeana becomes a significant place for contact and connections to be established between the network of partners, including commercial bodies. Finally, Europeana's ambitions (and those of the EC), if achieved, would imply a shift from a marketplace for cultural heritage content that is very fragmented, and it is accepted that discovery will take place in many venues (or through generic search engines) to one where a single channel might serve a large portion of users. Such a rebalancing of user expectations could constitute an environmental shift – an architectural restructuring – that may be hard for individual organisations to ignore in planning or sustaining their own services.

If people (or organisations, or products) are both constrained by and can act as constraints upon the behaviour of others, perhaps Lessig's notion of the modalities of regulation can be enhanced by bearing in mind the contribution of organisational science. As we previously remarked, Barnard himself recognised that organisations are only partial systems with crucial relationships to their

environment (Barnard, 1938/1968). More recent work in that school built upon this and started to consider ecosystems of organisations, structured around both supportive and competitive relationships, not merely exchange relations. In this population ecology approach, the effects of actors upon each other can flow both ways (Scott, 1990).

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Lessig's modalities of regulation - law, the market, social norms and "architecture" acting in a complex net of relations – have equipped us with an important analytical tool, imported from outside cultural heritage but applicable far beyond it. The idea offers a new perspective upon decisions in the formative stages of digital products, and also on the environment within which they then exist and which challenges their survival, and it has helped us to characterise some of the changes to that environment that might constitute a threat. For the Museum of London, where the motivations for the product appear to have been in large part internal (along with its on-going support), the constraints of the external environment may have generally less import for its sustainability, although ultimately they may affect both the value and resource parts of the cycle; for Europeana, on the other hand, there seem to be countless ways in which its value proposition and the barriers it faces interface with external constraints of one sort or another, and indeed various ways in which Europeana has sought (and may still seek) to modify constraints for itself or create them for others.

6.1.5 Constraints and the UK environment

In Chapter 2 we reviewed aspects of the UK environment, and it would be possible to interpret many of those constraints and positive motivations using the idea of modalities of regulation. We will limit ourselves to two, however, to illustrate the way in which modalities can shift and so affect decision-making.

The proposed amendment to the Public Sector Information Directive as put forward in 2011[176] would restrict exclusive arrangements between museums (*inter alia*) and commercial parties. Previously the constraints subjectively experienced by UK public sector organisations limiting such arrangements have been predominantly normative, or perhaps in some cases market constraints imposed by funders, and the proposal might be seen as an attempt to shift them into legal mode. Exclusive arrangements of the sort seen between the National Archive and Ancestry seem at first glance to be delivering, in Wiesbrod's terms, preferred private goods, and he suggests that these are often less desirable to non-profit organisations than public goods. If the amendment is considered necessary, then, it may reflect a perception that public sector organisations are not behaving in the expected and accepted fashion – that normative constraints are failing to act upon these social enterprises, and that legal regulation is required in order to enforce them. One interpretation of this would be that there is a disjunction between how some of the stakeholders in Europe's cultural heritage (politicians amongst them) seek value in it, and how the organisations that govern that heritage identify value. Whether the amendment represents a distortion or a correction of the decision-making process depends upon how

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[176] See 2.2.8, "The legal context", and 5.6.5, "Licensing and public domain".

each institution evaluates the importance of the stakeholders represented by Europe's law-makers.

A second example applies only to the UK, where in July 2012 the HLF changed their funding rules to enable it for the first time to support projects that were purely digital in nature. This significantly loosened a market constraint on the funds available from one of the UK's largest funders (HLF, 2012b). As a result projects that would previously have had to include a significant non-digital aspect even if the host organisation's primary aim was digital, can now be focused differently. Naturally enough there remain restrictions (constraints) upon what will be supported, but a much larger variety of projects now have access to the fund.

We can see from these examples how changes in the modality of a constraint might act to shift the balance of power in decision-making around the creation and expression of value and the securing of resources, which are central to our idea of sustainability. They might act to enable more organisations to act more efficiently, in the sense that Barnard meant for individuals: that is, to operate in line with their natural inclinations; or they might push in the opposite direction. They might lower barriers, reducing the cost of creating value in one way, or they may effectively prohibit it.

THE IMPORTANCE OF FRICTIONS

Frictions, as we mean the term here, are those elements that stop our imaginary scales from moving freely as the pans containing resources and value empty or fill. They sort into two types. One group relates to the decision-making process, especially organisations' knowledge about the inputs and outputs of a product

and how they deal with gaps in that knowledge. The other group concerns the relationship between those inputs and outputs, and the fact that it is not always a smooth and consistent.

6.1.6 DECISIONS UNDER UNCERTAINTY

We discussed previously[177] how gaps in knowledge feature in every part of decision-making, but uncertainty costs – we know this if only because we know that people buy insurance, in which premiums are calculated to favour the insurer making a profit. Dealing with this costly uncertainty in decision-making has two aspects: firstly, how we reduce uncertainty; and secondly, how we approach the residual risk.

Risk is commonly understood as having two important dimensions, as distinguished as far back as Knight's classic 1921 work (Knight, 1921), and beyond to many of the authors he cites. Firstly there is the true probability of an occurrence – its objective risk. If an unbiased regular dice is thrown we know that there is a precise 1:6 probability of it showing a five. Secondly, there is our confidence that our estimate of this probability is accurate, which we can consider the estimated risk of errors in judgement. If we are unsure whether the hypothetical dice might not actually be four or twelve-sided then there is an extra degree of uncertainty about our estimation of the likelihood of a five showing. Hard probabilities and gaps in information thus combine into an overall evaluation of risk.

Museums striving to reduce uncertainty around their product can address both areas, namely the real probabilities and impact of favourable or unfavourable

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[177] See 3.2.3, "Decision-making".

events happening; and their estimation of these probabilities. A real-world example might be a museum assessing its likelihood of success in a grant application. It might objectively improve its chances of success by working on its application and aligning its objectives more closely with the objectives of the funder. This pertains to the questions of value, resourcing and stakeholders that we have spent so much time considering. But before putting too much effort into the bid, it might also seek to gauge its chances of success better by discretely investigating how many other museums are planning to bid, or have bid in previous funding calls. This form of uncertainty reduction – understanding the odds rather than directly improving them – relates to information, measurement and learning (Hubbard, 2007). We cast an eye over these in Chapter 3, but what have we seen in the case studies?

At the Museum of London, one risk highlighted whilst the CIIM was being planned and built concerned the resources that it would demand following its launch – in other words, its on-going costs rather than the build, although this too had risks. Sussums was attempting to introduce workflow improvements that were in part inspired by her experience at other museums, and she had thus imported knowledge to MoL that informed the plans. However the novel context and the ambitious nature of the software and processes still made it difficult to be certain how much extra workload it would place upon existing staff, or if indeed the hoped-for savings in staff time would appear. Reputational risk was also identified by stakeholders, a hazard that amounts to a potential cost (or lost value).[178] Efforts were made to mitigate these risks, in particular through the

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[178] See 4.5.2 "Policies and priorities".

development of policies. However the archives show little evidence of attempts to improve the *estimation* of these or other risks. The museum appears to have depended upon the accumulated knowledge of the core team and the stakeholders that were consulted.

Since launch, the museum has suffered a loss of some areas of knowledge during a long period with no internal web technical capacity, and certain types of decision would face greater uncertainty as a consequence. However, in other respects knowledge has accumulated within the organisation, which now has experience of the CIIM's capabilities and limitations and can judge better how it could be used to deliver value through different channels, meaning that some future evaluations of resource and value requirements can be made more confidently.

Turning to Europeana, we saw uncertainties in many critical areas: resource requirements, the ability to secure resources, the productivity of the service, and the value of its output.[179] The significance of these uncertainties, however, was amplified by its dependence upon resourcing partners whose interests depended critically upon understanding the benefits and risks of the project; the very complexity of its resourcing arrangements multiplies the dimensions of uncertainty. One of its particular challenges, then, was in reducing these perceived risks *for its resourcing stakeholders*, particularly its content partners, which was addressed in part (as we observed in 6.2.2) by attempting to develop brand equity, trust, and a clear unified vision, as well as disseminating the results

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[179] We are distinguishing here between the objective benefits or value, and the subjective value, referred to by economists as utility. See 3.2.2, "Resources".

of various strands of research[180] and statistics on the use of the portal website. It remains to be seen how successful this strategy will be, although Europeana's momentum appears to still be building with steadily increasing numbers of partners and records in the database. Its key strength – the area where uncertainty is relatively low – is in its medium-term funding from the European Commission. In fact, whilst Europe's economic straits may have increased uncertainty elsewhere, they seem to have contributed to extra support for the Digital Agenda.[181]

Institutional knowledge, for Europeana, consists in part of that learned through its activities and research and in part from the expertise of its network, in particular those participants in expert working groups. It has also made some specific attempts to measure the size of its market (Clapton, Hammond & Poole, 2011), and monitor aspects of its impact (at present limited to marketing reports and website statistics), information used to inform future decisions internally and for advocacy.

It is clear from all we have seen of Europeana that information-gathering is a central part of its decision-making process. However it is just as important to its efforts to mitigate whatever of their concerns its resourcing stakeholders have identified as being barriers to their participation, to a degree unseen at the Museum of London.

The case studies showed efforts to reduce both objective (actual) and subjective (perceived) risk. Both are served by better information, but there remains an

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[180] Verwayen, Arnoldus and Kaufman (2011).

[181] See 5.5.4, "Policy makers".

acknowledged gap in how the value of digital heritage is understood, evaluated and measured (as there is for heritage more generally), highlighted by the work of Ithaka S+R and others. This, however, is an area of active work. Culture 24 coordinated 16 museums and other cultural organisations around the UK in a multi-dimensional investigation into evaluating online success (Finnis, Chan & Clements, 2011), a study which inevitably also highlighted the crucial need to know what success actually means within an organisation and how that be reflected by a variety of metrics and measurement tools. Its tight, sector-specific linking of value with measurement and its emphasis on reporting to external stakeholders made it of considerable value to practitioners. JISC has also funded various studies into understanding the impact of digitisation (Meyer, Eccles, Thelwall & Madsen, 2009; Tanner & Deegan, 2011). Tanner's most recent research (Tanner, 2012) delves deeper into this, firstly teasing apart the dimensions of value that digitisation opens up, and then seeking new methods for measuring it by borrowing techniques from fields such as health and social policy. Although focused primarily upon the impacts of digitisation, his analysis of the aspects of value that digitally active cultural heritage organisations can thereby offer, and the planned evidence-gathering methodology, may both prove helpful. There are other areas of research and practice that could assist museums in measuring their success or tying what is measurable to what is desirable – because as Hubbard (2007) makes clear, what is ultimately important can rarely be measured directly and we must instead use proxies. Logic Models are one tool that may assist (see for instance W.K. Kellogg Foundation, 2004). They draw a distinction (much as Tanner does) between outputs, outcomes and impact, with the aim of keeping a focus on the results that really matter. What measurements

need reporting, to whom, and when, follow from this. The objective of logic models is to build explicit links between the priorities of funders, deliverers and end-users, founded on a common understanding of what matters, to enable informed decisions all along the chain.

Informing decisions through learning and measurement has other hurdles besides those we have mentioned (such as retaining knowledge and identifying suitable proxies for value). One such lies in the cost of information, which itself is a limiting factor upon the data that may be gathered before making decisions. One interpretation of what we saw in Europeana is that it invested very heavily in gathering information to make its decisions – far more than in building technology – although it is difficult to tease this apart from its overall efforts to build a network, a brand and a value proposition that all stakeholders could support. At MoL, scarce funds were committed to a specific investment in information gathering before the CIIM was built,[182] and previous web and digitisation projects there always included a sum of money for formative and summative evaluation work. Information, in other words, can be costly but was clearly seen as valuable in both of our case studies; however there is a point beyond which the cost of information outweighs the benefits of reduced uncertainty.[183] A further limitation upon the use of available information is timing. Predictions of future performance and consequent decisions about on-going investment in museum digital resources are, naturally enough, often based upon an evaluation of past performance, but in such a feedback arrangement a

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[182] That is, the £2000 allocated to a "health check" (see 4.4, "Resources and other constraints", and 4.5.1, "Building consensus"), although in the end this was offered *pro bono*.

[183] Pragmatic approaches to estimating the worth of a piece of information and the cost of acquiring it can again be found in Hubbard (2007).

delay between investment and measurement can act as a friction, weakening the link between resourcing and value.

What then can be said about how decision-makers approach the residual risk that inevitably remains after they have gathered together all that they know about a choice – that is, the probability of poor outcomes from that choice and the uncertainty attached our estimates of this probability? To this question psychology may offer some insights.

We previously cited the existence of insurance as evidence for the cost of uncertainty, or conversely the willingness of agents to pay for increased certainty. Two explanations for the insurance market are commonly offered (see e.g. Knight, 1921; Shanteau & Ngui, 1989; Beach & Connolly, 2005). The first is predicted by classical microeconomic theory that assumes, typically, that money has a diminishing marginal utility. This means that, whilst the loss of a large asset may be a rare event, it would be felt as disproportionately even larger than the asset's actual size when compared to a small premium paid frequently to protect against such a loss.[184] Even where this does not apply, other economic rationales for investing in reducing uncertainty also exist (Folta, Johnson & O'Brien, 2006; Pindyck, 2007). The second explanation of insurance – and for approaches to risk more generally – lies in a complex of psychological biases that

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[184] If losing £1000 is more than 1000 times more harmful (damaging, undesirable) than losing £1, a person may be prepared to pay *more* than £1 to avoid a 1/1000 chance of losing £1000. This creates space for profits to be made by those more tolerant of this risk. Note also that a major loss might constitute an existential threat to a party, which is qualitatively rather than quantitatively different in nature to the loss of a premium.

in some cases combine to favour conservatism even if it makes no sense from a purely mathematical perspective (Shanteau, 1992).[185]

Such psychological factors are a powerful force in the regulation of decision-making, which has at its heart evaluations of risk, although they do not necessarily follow the pattern seen in the purchasing of insurance (Beach & Connolly, 2005; Simon, 1978; Shanteau, 1992). Shanteau and Rohrbaugh (2000), for instance, argue that innovation is often inhibited "not [because of]the absence of good ideas or lack of motivation [...] Rather, it is the presence of social and psychological barriers that is the key problem for managers". The familiar status quo is frequently favoured over change for reasons that do not make sense seen from the perspective of normative gambling theory.[186] The result can be a preference for investments with low but relatively predictable and familiar pay-offs rather than others that promise greater rewards but with higher uncertainty. Missing valuable opportunities through conservatism, then, is one consequence of this form of undue risk aversion, but as Beach and Connolly (2005) remind us there are others. The *sunk cost trap* is well known and somewhat related to conservatism but, rather than avoiding making innovative investments, it leads to a tendency to continue resourcing bad investments because of costs that cannot be recovered, rather than because of the value that additional *future* resources can produce. The result of this logical fallacy may be that a product is sustained beyond the point of justifiability. Broadly speaking we

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[185] Thus, as Simon himself points out (Simon, 1978), psychological research supports his concept of "bounded rationality" (*ibid*, 1957), because the limits upon agents' ability to calculate choices prevents them from acting entirely rationally.

[186] That is, even when the probability of a favourable outcome more than compensates for higher risk, it may be forgone when stasis is assessed as lower risk.

can say that an aversion to loss is often greater than an attraction to an equivalent gain, but this is complicated in nonprofit organisations by the difficulty we previously noted whereby inputs (potential losses) and outputs (value) are in different units. The research presented by Shanteau and Rohrbaugh (2000) concerns the barriers to innovation in small enterprises, which may have certain parallels with digital teams in museums. Top amongst these barriers is risk and uncertainty, but this is rivalled by time constraints: typically, the authors suggest, there is a bottleneck of one or two decision-makers through which innovations must pass even in large corporations, and their time is dominated by immediate concerns more than long-term planning. This joins a strong cadre of influences favouring conservative, risk-averse decisions.

Psychology does not always work in the direction of conservatism, however – far from it, in some cases. People (other than gamblers) are typically risk averse for gains, forgoing opportunities to gain where the risk of loss is proportionately small, but they are risk-taking for losses (which works against the insurance industry)(Kahneman & Tversky, 1979, as cited in Beach & Connolly, 2005). Framing plays a large part here: whether a choice is posed as a potential gain or loss has a crucial impact upon decisions (*ibid.*).

We cannot say with any certainty that a given psychological factor played a part in any of the sustainability-related decisions of our case studies: that would require a different set of research tools to that used here. Nevertheless we can identify occasions where they might be consistent with what we have seen. For example one might conjecture that at MoL Ross's success in persuading internal

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stakeholders to steer a new path with the CIIM was partly attributable to how she framed it. Also at MoL, senior management's decision not to replace the staff that supported the museum's core web systems, even as it invested in major digital infrastructure, may have made sense in the light of information unavailable to us, but might it alternatively reflect decision-makers retrenching to the familiar, avoiding areas in which they felt uncertain of their ground? Or could it be explained by the time pressures put upon managers in an institution in flux who, as Shanteau and Rohrbaugh suggest, responded with conservatism? Meanwhile at Europeana we saw the introduction of the DEA *after* many organisations (or more importantly, individuals in those organisations) had invested effort and reputation in the project, and might posit that the sunk cost trap played a part in their overwhelming decision to remain in it, or perhaps that positive framing of participation was influential.

The scope exists, no doubt, for the psychology of decision-making to be turned to the advantage of a party that wishes to influence outcomes. More commonly, though, we suspect, it plays a subconscious role in nudging evaluations of risk and introducing bias into the decisions based upon them.

Finally it is appropriate to revisit the influence of management and organisational structure upon decisions. In the Barnard/Simon tradition of organisational science first introduced in Chapter 3, organisations are seen as working better when the individuals that make them up are motivated by a shared alignment of interests and values, and where people's "bounded rationality" draws upon organisational culture and learning to fill in the gaps with heuristics and shared habits (see also Levitt & March, 1990). We can see

how it bumps up against psychological research into decision-making; and we can hear echoes, too, in writings on museum management, for example those of Suchy (2000), for whom "passion" counts highly in leading and guiding decisions – surely passion is the apogee of alignment, as Barnard meant it? Janes meanwhile, argues powerfully that the mission and values which should drive a museum forward must be formulated in partnership with staff (Janes, 1997). In practice, however, the proximal objectives of departments, teams and projects in a living organisation often obscure the wider, shared aims. MMW-O offered an example of this, as Farrows (2012) testified, with what he termed the vertical objectives of the project team competing with and the horizontal or institutional objectives of the web department, "who wanted to place all sorts of restrictions around what we could and couldn't do". Consequently, "a clear tension" arose, he suggests, "between the 'creative' aspirations of MMW and the 'data management' requirements of the organisation". Although this appears detrimental to the project – the "vertical" – seen at a larger scale such horizontal checks and balances, embodied in the organisational structure, may sometimes be beneficial overall, if only through enabling clearer decision-making. But the partitioning of activities and priorities through organisational structures – just like resource partitioning – can clearly present challenges and, potentially, conflict.

From Barnard through Simon to Janes, Suchy and others, the diverse theorists and practitioners from the last 80 years whose work we have considered seem to suggest that a failure to bind individuals and organisations together with common goals and values will lead to loss of focus and poorer decisions, and perhaps also reduced morale and associated problems such as loss of staff. The

Museum of London's challenges during and after building the CIIM, as Sussums pointed out, came less from a shortage of cash than from the loss of key staff at various points in the project. We cannot say whether this can be attributed to morale, but we have seen that upheavals in the management structure left a vacuum in leadership over digital matters generally, and no common vision around which to align. In section 4.1.12, we saw that the position of digital media at MoL, and specifically the CIIM, appears recently to have taken a marked turn for the better, with both grant-based and core funding for permanent and temporary positions, and the institution of new decision-making structures and strategic oversight (Bromley, 2012; Looseley, 2012; Museum of London, 2012). Co-ordination appears to be improving, then, and the coming years may show whether these changes help MoL to maximise the value of the CIIM and its wider digital presence, and to develop the ethos that (under labels such as commitment, passion, alignment or common purpose) Suchy, Simon and others consider so important.

It scarcely needs saying that partnerships add complexity to decision making, as a comparison of MoL's project with Europeana and MMW-O illustrates. Are there ways in which this complexity can distort the outcomes? We cannot draw firm conclusions on this from the case studies; however, what seems clear from Europeana in particular is that, where the interests of key stakeholders have small overlaps or maybe conflict in a critical area, options may be limited and negotiations towards a value proposition that suits all parties difficult. An inflexible value proposition leaves less room for manoeuvre if conditions change

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and may leave it more vulnerable in the long run. In Europeana's case, work

continues on building the common ground necessary to ameliorate this.

6.1.7 ECONOMIC FRICTIONS

A variety of factors cropped up in our case studies that, if not introducing

distortions into decision-making, served to nullify simplistic economic

assumptions and models and complicate the efficient allocation of resources

(especially when combined with the effects of uncertainty). These include fixed

and non-productive costs, and barriers to entry and exit.

The decision to build a new digital product can be affected by the effective or

perceived cost of entry, which in turn may be influenced by the reversibility or

otherwise of the investment, especially where there is uncertainty over the costs

or benefits (Caballero & Pindyck, 1996). A further factor (applying also to

ongoing support and development) is that costs are generally not infinitely

divisible: value production requires a certain level of investment before any

benefit accrues.[187] This may mean that there is a fixed minimum cost – the

gambler's ante – and it may mean that some costs increase step-wise rather than

gradually. At MoL, the minimal cost for the CIIM was far higher than for the non-

infrastructural alternative – in the event, not too high to prevent its

implementation, but equally this was not a system that could have been built

incrementally: a big investment was the only way to achieve it. We might recall

the idea of core and surplus value at this point,[188] where a minimum payoff is

required but beyond that is the "profit": with high barriers to entry, the

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[187] In other words, if a minimum viable product will cost £10000 then an investment of £500 will yield nothing, rather than 5% of what the full £10000 could yield.

[188] See Chapter 4.3.1, "Core and surplus value".

minimum payoff is equally high (but it might be relatively certain), but the surplus value on the other side is perhaps the real reward of this higher-stakes approach. At Europeana content providers may face noteworthy fixed costs or other barriers that must be overcome simply to get started: "tooling up" to provide data and media involved them doing data mapping and possibly technical work that could be costly, whilst for some partners understanding the benefits of participation was itself a large hurdle involving an investment of effort without being in itself productive. Whilst Europeana made efforts to tackle these barriers and to ensure that there would be benefits for all stakeholders even before its full value proposition was in place, the basic costs of participation cannot be entirely eliminated. Perhaps now the most important fixed cost for content partners is the opportunity cost they may perceive in releasing all metadata: this is a fixed cost but of unknown size, because it cannot be reversed (once data is licensed freely a more restrictive licence cannot imposed upon that version of the data).

There may also be barriers to exit, besides the psychological ones we referred to earlier (such as the sunk cost trap, and framing). A system like the CIIM is valuable because of what is built upon it; removing it would therefore mean breaking such dependencies. Financial penalties in contracts with suppliers may make it costly to forsake a failing system. Such barriers may contribute to a product being sustained beyond the point at which its positive benefits cease to merit it.

A further economic friction can take the form of limitations on the uses to which some resources can be put. Many of the most important resources required for

museum digital projects are far from generic – they are very specialised. They may in some cases be available only internally, and inflexible in supply. Expertise in the collections, or certain uses of the collections, may act as a bottleneck, and alternative uses for those resources act as a market for them. Generic resources, on the other hand, may be in shorter supply, and although theoretically flexible may still be unable to convert into certain factors. The Museum Of London offers an example where a shortage of specialised resources was not easily compensated for with additional generic resources.[189]

Earlier in the discussion we discussed the merits of partitioning resources – for example by department – where it can simplify the process of deciding between alternative allocations of resources. This might also introduce, of course, a theoretical friction into the optimal allocation of resources for an organisation to maximise its impact, if it prevents the same resources being used in the area that would be most valuable to the organisation as a whole. Practically speaking, because most resources are already in fixed form as specialised expert labour, equipment, premises or other assets, the partitioning of budgets into departments, projects etc may be relatively insignificant. Certainly converting those fixed resources into some other form can be difficult, involving redundancies, restructuring, or even disposing of collections - at best, then, they are assets with low liquidity. We also discussed the significance of opportunity cost to an organisation where investment is generally once-and-for-all, with little chance that it can be recovered and reinvested elsewhere. Frictions arise here because of the inherent uncertainty around opportunity costs, and also because

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[189] See 4.4, "Resources and other constraints".

they are tied up with the psychological effects we touched upon earlier: the low value put upon missing out upon something we don't have compared to losing the same thing if we already have it, the sunk cost trap and so on. Combined with framing effects, these can play out differently in various opportunity cost scenarios. Notably for our study, this implies that the problems of securing investment in a *de novo* product may be markedly different to those for supporting an existing one, not only because uncertainty is lower but because the perceived value of the "bird in the hand" is higher. We did indeed see at the Museum of London reports of curators and other staff "buying in" to the CIIM. Whilst it is hard to disentangle this from the phenomena of institutional learning and reducing uncertainty, it is not inconsistent with the idea that staff were becoming attached to what they had because…it was what they had.

A final complication faced by many projects is indicated by the Ithaka S+R studies (Maron, Smith & Loy, 2009; Maron & Loy, 2011), amongst others, which point powerfully to the challenges faced in moving between building and maintenance phases, and in particular in finding the means to support a product once project-based funding concludes. BMICE identified the problem of digitisation in Netherlands being funded with short-term aims but without funding for long-term access, declaring that it must be restructured to make it into a "strategic tool for the long term" (BMICE, 2010, p. 32). The question arises, how does this phase-shift disrupt how products are built and managed?

Many digital products at the Museum of London, not only the CIIM, were significantly resourced by project-specific funding from outside which was frequently used to secure resources such as design and development skills from

contractors or companies.[190] Other products were internally resourced but treated as projects,[191] with an allocation of staff time. Either way, the conclusion of a project marked a point at which each product had to shift into a mode where it could survive with far fewer resources, regardless of how these had previously been provided. Where it could be supported with operationally-funded internal factors (principally staff time and software) it joined a catalogue of products sharing the same relatively static pool of resources and treated as part of "business as usual". In other words, favoured access to partitioned resources (possibly including that key generic resource, money, for securing additional labour and skills from outside) would be replaced by competition for a limited pool of internal factors. The sole and partial exception to this was the main MoL website, which was regarded as being a core service that had priority over most other needs. In effect, the change from project to programme at MoL had always meant going into near-stasis.

Making the shift in the case of the CIIM was perhaps harder than usual, and different in nature too. The museum found itself with a piece of infrastructure that had no equivalent elsewhere (and so no peer from which to learn how to use it effectively), and without the two developers whose experiences had helped to inform its design. That loss of insight, as much as the lack of actual development capacity and knowledge of MoL's website software (its CMS), delayed by a year the last phase of the original project (putting the collections search onto the

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[190] Examples include websites for the LAARC (version 1), Exploring 20th Century London, Great Fire of London, Postcodes, Voices Online, Learning Online (version 1).

[191] At least between 2002 and 2010, during which the author was one of the museum's developers. Examples include LAARC (version 2), Learning Online (version 2), Ceramics and Glass, and many gallery and temporary exhibition microsites.

website). But part of the rationale behind the CIIM was that it enabled constant reuse, so "business as usual" would entail a steady stream of new uses for it. The first of these, and the first to use the concept of sets of objects and "contextual metadata", arrived within a year of the CIIM's delivery, and sets are now regularly added to the website.[192] The other key role of the CIIM in live mode lay in streamlining the flow of collections data from Mimsy XG to user-facing applications, and it would appear that work continues apace, with 52000 items online by September 2012. Overall, then, although the final phases of the project were disrupted, it appears that in programme mode the CIIM is operating smoothly, if not at a level that maximises its value. However, the new structures set up in mid-2012 indicate a refocusing of digital activity that may change this.

At the Museum of London we saw a product built around and aligned with the aims of a project whilst trying to realise long-term ambitions, at Europeana the large, long term ambitions were the rationale for its funding from the start, but it was still undertaken project-by-project. Moving between phases always meant moving into another phase of planned development and support – from EDLnet to Europeana v1, and from v1 to v2. It is running a live product, but its funding and its process of continuous innovation run along project lines.

A POSITIVE MODEL

The case studies introduced a dose of reality to the theoretical model presented in Chapter 3, and gave us cause to consider further some factors that add complexity to the sustainability "cycle": the relationships of stakeholders, the

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[192] See: http://www.museumoflondon.org.uk/Collections-Research/Collections-online/BrowseCollection.aspx. In September 2012 there were 9 thematic sets totalling around 9000 items.

external constraints, and certain frictions that can interfere with balanced decisions. We have attempted to gain insights into these using concepts imported from the overlapping fields of microeconomics, organisational science, psychology, public policy, and theoretical law. Now we can synthesise them into a revised version of the model – not a normative model describing how the process *should* look, but a positive model that better describes what is actually seen.

From almost the start of this thesis we have taken the point of view that sustainability is *not* merely the continuation of something – meaning, in our digital heritage context, a product or a service – but rather that sustainability means balance: that only if the outputs *justify* the inputs can that something really be considered sustainable. If the sustainability of the product amounts to balance, then, one obvious metaphor was that of a set of traditional scales, with a pan on either side for inputs and outputs, and the desirable, sustainable condition being that the scales are level or tilted in favour of outputs over inputs. The scales' pivot would represent the process of evaluating options and making decisions. But both this model and that of Collins' flywheel were somewhat limited in their ability to allow for the necessary nuances around decision-making and the flow of resources and value, and having now identified three other categories of factor that influence sustainability they are clearly too simplistic.

Chapter 3 introduced the cycle dynamic as an alternative model, elementary but adaptable. Many such cycles (or partial cycles) can be created, one to describe each resource- or value-related decision around a product, but with

interdependencies, and which, seen together by an omnipotent agent, might be assessed as a whole. We can think then about an overall lifecycle of value, even if it is difficult for us to see the entire picture objectively.[193]

Our museum case studies gave no reason to doubt that the cycle model is a valid way of looking at products and the decisions around them, but they showed many ways in which the real world can introduce complications (as we had hypothesised in Chapter 3), and which make for a more intricate dynamic. Complex stakeholder communities may affect the understanding and distribution of value and (significantly) the location of critical decisions. An operational role for the product (such as raising revenue or improving workflows) can muddy the waters when understanding resources and cost. The equilibrium might at any point be upset by some change in the external context that affects the availability of resources or the opportunities for value creation, or that alters the constraints that regulate decisions, to use Lessig's terms. Measurement problems might cause value to be over-estimated, or resources inaccurately accounted for. Decision-making can be thrown off-kilter by the delays between investment, output and assessment; or by organisational structures that complicate the process; or by excessive risk aversion or other psychological phenomena. Barriers to entry or exit, such as minimum investments or decommissioning costs, can disrupt the smooth transition of resources into value. In the previous section of this chapter such complicating factors were organised into three grand themes – actors, context and frictions –

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[193] Before the lifecycle phase begins there is also the build phase, which sets the starting conditions for the lifecycle of value, and build-type activities may happen continuously thereafter.

which in reality overlap but are nevertheless useful and which inform a revised

model presented in Figure 13, where they are presented as operating at different

scales upon the cycle.
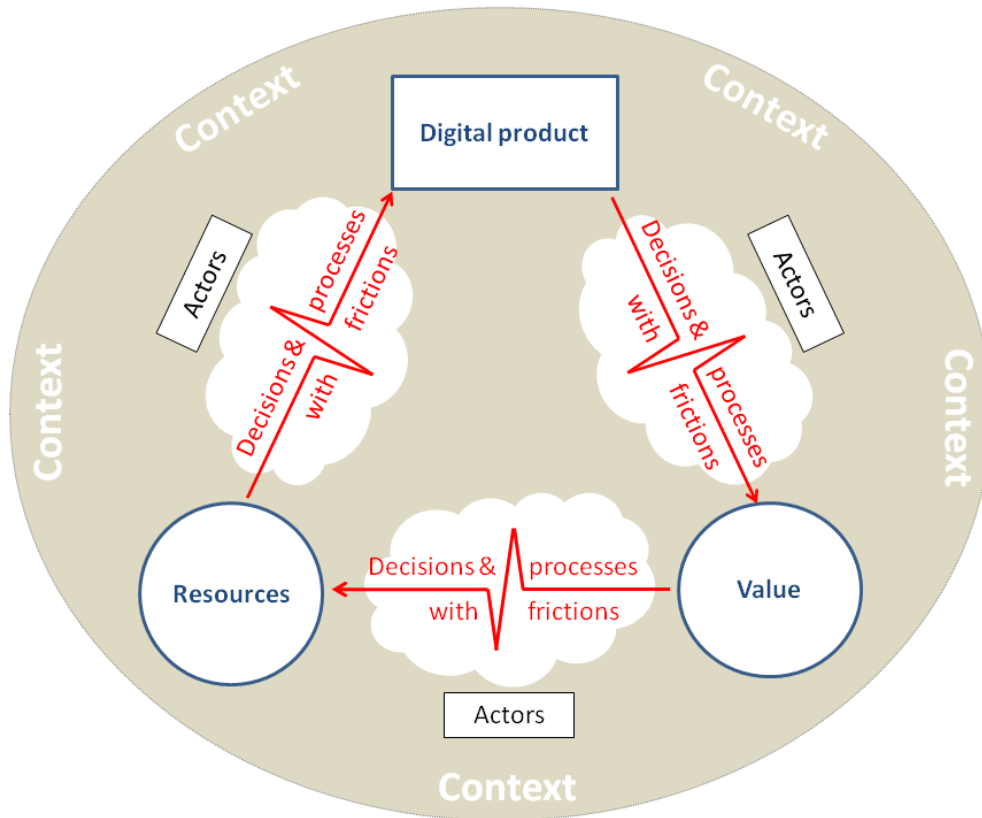
Figure 13: the revised model showing context, actors and the frictions acting upon decisions and processes

At the grandest scale, surrounding everything, is the context in which a product

sits. Its evolution causes both value (its location and weight) and resources (their

availability and cost) to fluctuate over time. The context also forms the set of

"regulatory constraints" that help to frame and inform how decisions are made.

Its stability is very significant for the degree of uncertainty that must be

addressed, with its attendant compensations and costs. Within this fluid

environment the processes that link resources, value and the product, and the

decisions that enable these processes, are shaped by actors – people and

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organisations. Multiple stakeholders are involved in different parts of the whole

cycle of value creation, and each resourcing stakeholder makes its own

evaluation, potentially withholding a vital resource if (from their perspective)

the balance of cost against value is not right in their particular decision. One

specific imbalance can thus disrupt the cycle even when the balance, seen

holistically, appears good overall. Resources and value are effectively partitioned

by different parties in this way, making it too simplistic to treat them as part of a

single equation. A product's putative owner must attempt to reconcile these

various needs in order to strike a functioning overall balance – one that both

serves the needs of (resourcing) stakeholders and still produces an overall value

that satisfies the owner too. The diagram introduces "actors" into the spaces

between the product, resources and value in order to depict this. Finally, within

particular decisions there are various frictions. These interfere with the optimal

allocation of resources and distribution of value (for example through barriers to

entry or delays and flaws in the evaluation of outcomes), or they cause the

decisions themselves to be poorly judged, for instance because of attitudes to

uncertainty and risk or to sunk costs. The diagram shows frictions as

interruptions in the arrows flowing around the cycle.

6.1.8 A COMPARISON OF THE MODEL

We have seen in the literature of digital heritage from recent years a small

number of efforts to understand the problem of sustainability,[194] and to model

business planning in this non-profit, social value-orientated market. The CLIR

and Ithaka S+R work had strong commonalities with the value-centric approach

taken here, albeit taking a more practical approach and concentrating mainly on

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[194] See 3.1.2, "Sustainability on the agenda".

service-like products. Their examples drew in large part from projects where sustainability was predicated upon the production of what Weisbrod (1998) termed "preferred private goods"; that is, where charging end-users was built into the business model. BMICE, too, considered private goods, but placed more emphasis on understanding and generating non-monetary social value.[195] It also explored the interdependence of the various parts of the value proposition and resourcing, and considered a number of particular internal and external challenges that we have touched upon here: organisation, technology, copyright, and revenue models. BMICE itself was developed using the "business model canvas" of Osterwalder and Pigneur (2010), which is depicted in Figure 14.
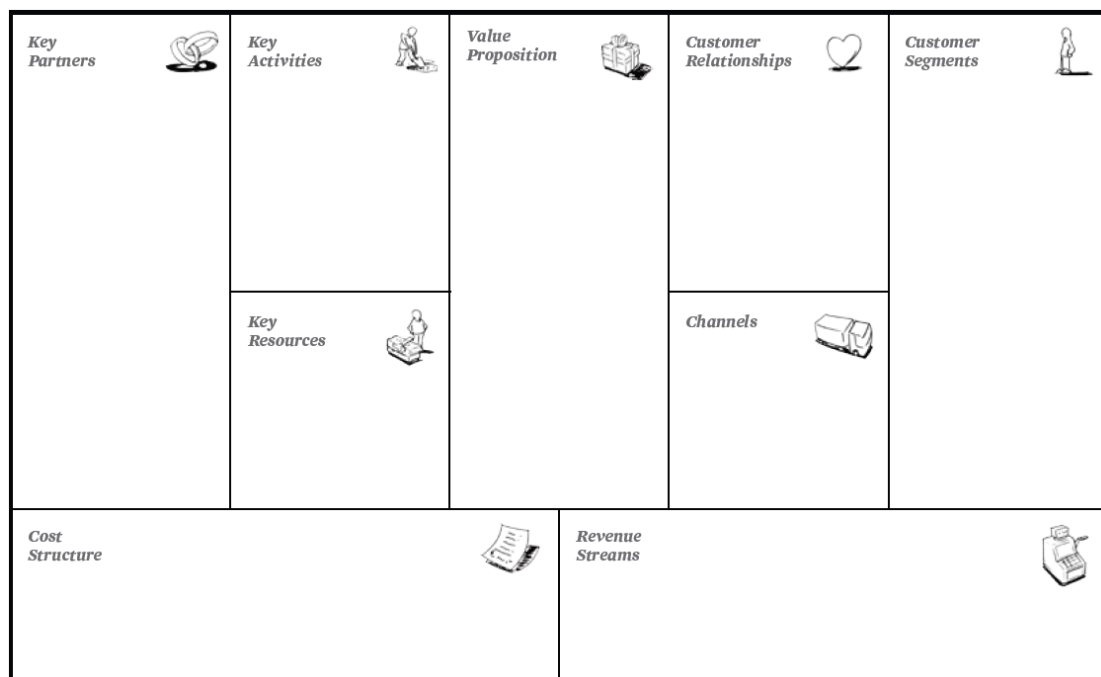
Figure 14: the Business Model Canvas. *From Osterwalder & Pigneur (2010).*

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[195] This may be a reflection of BMICE's European perspective. It is unlikely that one would find in US-based CLIR and Ithaka work a statement akin to the following from BMICE: "Profit maximisation is not an issue [for cultural heritage institutions] and does not serve as a point of departure for business model innovation. Governments invest in the cultural sector in order to safeguard public interests." (de Niet, Verwayen & van Kersen, 2010, p.26).

Whilst this study's perspective is generally consistent with BMICE, Osterwalder & Pigneur, CLIR and Ithaka's approaches and findings, the cycle model and some of our findings from the museum case studies can offer additional nuances. The conception of sustainability as a set of interlinked cyclic processes governed by decisions gives rise to our emphasis upon the role of evaluation and decision-making, the complications they can introduce, and the distribution of important decisions outside the host organisation arise from. The way in which resourcing stakeholders are seen, when part of a cycle of value creation, is also different, and we see how outputs of a given process can appear as a direct source of value to one party but a resource to another. Accounting holistically for all of the inputs and outputs, costs and benefits of a product also encourages us to examine carefully the many resources that appear to be free or low cost from the perspective of a product owner or one stakeholder group, but which may have hidden costs which a socially-motivated museum should also consider.

Overall, the cycle model complements alternatives like the business model canvas by, firstly, emphasising the things that can interfere with a business model to limit sustainability, and secondly by treating the product as part of an ecosystem or as a link in a chain of value, for which one could equally well draw the connecting links from the perspective of its stakeholders.

ONE LAST REINTERPRETATION: BACK TO THE MODERN WORLD

Making the Modern World – Online was the starting point for this investigation of the sustainability of public-serving digital products in the UK museum sector, and having passed through the process of developing and refining our model it

pays to revisit that landmark project with this in hand to see if we can understand it any better.

The history of MMW-O shows that it has clearly survived well, and to this day it continues to return value in the form of high visitor numbers from around the globe, with low maintenance costs. Aspects of its original proposition never materialised, however, notably the promise that it would lead to a wider digital media programme. Sustaining it over the last eight years has in a sense required no decisions: a commitment was made to the Treasury (via the ISB) to run the site for ten years; running costs have been low and usage has met predictions and there has therefore been little need to challenge this. That ten year commitment might be seen as a partitioning of NMSI funds imposed by ISB – a powerful economic friction – or perhaps as the inescapable outcome of a gamble entered into a decade ago; either way, no-one at the Science Museum appears troubled by it. Perhaps because of this there has been no question about the value of the site either, and as a result it is hard to know whether the simple, ISB-friendly metric of user sessions really corresponds well to what is important to NMSI. The context has changed radically, not least in terms of user expectations and demographics and the ways in which web content is accessed, but if none of these dimensions are measured then the a full picture of the impact of MMW-O remains obscure.[196] Interestingly, Farrows' evidence indicates that that MWR, the private sector partner, in fact sought to further the partnership beyond the launch, to find new ways to both realise value and generate revenue from and for

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[196] That being said, Robert Bud is fully aware of the diverse and global user base and lauds it as one of MMW-O's great strengths: "One of the things that I think the web can do is enable us to escape from being a museum in the southeast corner of a small island. If we're going to get global funding then we need global users. And things like MMW bring us a global usership." (Bud, 2012).

the product, yet for a variety of reasons these ambitions came to nothing. He suggests that MWR's role in the MMW-O was, in reality, as a service provider, arguing: "this 'services model' for large projects is, by definition, not suited to sustainability - there is a budget with a fixed timeframe for delivery. At the end of the project, everyone moves on to the next project" (Farrows, 2012). Bud and Nahum, too, spoke of how all parties – themselves included – moved on to fresh projects once MMW-O was live. And thus at MMW-O's heart we can perhaps perceive a contradiction between "investing to save" and adopting a project-based perspective that is poorly adapted to the on-going development of value.

Dan Evans worked in the Science Museum's web team during the time that MMW-O was built, and now heads the department. In September 2012 Evans provided his perspective on how the project was seen whilst it was underway, reflected on the significance of how it was built in terms of its longevity and success, and provided a timely update what the future holds (Evans, 2012). As he recalled, it was a source of frustration for the web team that the MMW-O project was run in effective isolation from the Science Museum's other web activity – an observation that finds echoes in Farrows' remarks. For Evans, the product that resulted from this isolation was weakened by having little to link it visually to the Science Museum brand, and no connections between it and the main website. He reflected, however, that in retrospect its detachment from the bureaucratic apparatus and myriad stakeholders of the host organisation - perhaps including the web team itself - may have enabled Bud and his colleagues to make decisions more flexibly and to act faster. Certainly this fits with our observations above that partnerships (and indeed complex organisations) can complicate and slow

down decision-making,[197] and just as importantly narrow the available options into too small an area for cost and benefits to balance out. MMW-O was a partnership, but one that appears to have established a clear common vision early on, with the various actors being well aligned behind the overall goals even if they had some individual objectives of their own (and even if, in Farrows' characterisation, MWR's role was more that of a service-provider). Evans suggested, too, that the decision to hold all of MMW-O's content in a simple XML form could be credited with the fact that it has been "rock solid" and run without problems for eight years. It may have been controversial at the time, but the decision not to use the museum's content management system appeared to have turned out well for its technical sustainability.

Evans also offered a tantalising insight into what the future holds for MMW-O. He described how his department is leading on the process of building a mechanism (known as MMX – "Making the Modern 'X'"), using semantic web technology to link together data and content from several data sources including its collections management system (Mimsy XG, like at MoL), and a number of websites. This has much in common with the approach taken by the CIIM, but differs in both its scope (incorporating other varieties of data) and implementation (placing an RDF triple-store at its heart, a plan that was dropped part way through the CIIM's build). Much of the content from MMW-O will be ingested into MMX, along with that of two more of Bud's websites that used the same approach to narrative, Ingenious and Brought to Life. Evans explained that representing narrative was central to the rationale for the system. This being so, we may

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[197] See 6.2.1, "Organisations, partnerships and ownership.

perhaps detect the influence of MMW-O in MMX's very existence. MMX itself can

been viewed as an effort to prepare NMSI for what the future brings, an

acknowledgment of a fluid environment that, by preparing a solid common base

for future projects, may also neutralise the need for a whole set of *ad hoc*

decisions at a later date.

It is instructive to reflect that the original plans for MMW-O to act as a platform

and toolkit for future content creation never came to pass, and its raw value

proposition remained unchanged from 2004 onwards: in that sense the Invest to

Save bid did not succeed. And yet it did contribute to building value elsewhere by

providing a learning opportunity that informed subsequent NMSI projects, from

Brought to Life to, perhaps, MMX – not to mention providing the seed for

technology that MWR later commercialised (Farrows, 2012). In doing so it may

have sown the seeds for its own rebirth, its longer term sustainability, through

both the simple strength of its content and structures, and the robust simplicity

of a core part of its technology. Perhaps the decisions that brought it to this

position are not typical, but they nevertheless took place in the face of resource

and technology constraints, complex and sometimes conflicting values amongst

stakeholders, a costly decision-making process,[198] and changing context, just like

any other digital product must. Maybe now, with the help of this long

perspective, we have some fresh insights into the significance of these influences.

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[198] As Chapter 2 showed, the project management methodology was a heavy burden which may or may not have helped the quality of decisions or the monitoring of expenditure and progress by the funders, but could certainly be seen as a significant cost and perhaps a friction too.

7 CONCLUSION

This thesis has attempted to understand the influences acting upon the sustainability of public facing digital resources, in the context of museums in the UK and the heritage sector more generally. Rather than striving to propose solutions to the specific problems that are often identified as undermining "sustainability" – typically financial and technical problems – our analysis first tried to locate a robust meaning for the term. This meaning, if not objective, at least plainly puts the subjectivity of the term at the very heart of the conundrum; for if the sustainability of a product is the balance between its costs and benefits, but those benefits (and often those costs) have no objective measurement, then that subjectivity becomes integral to every decision made about the product. The focus has been upon the evaluations that organisations make about resources and value and the decisions that ultimately determine the fate of digital products. We have tried to use our three case studies to gain some insights into how these choices are made and what can influence them, as well as perhaps to flush out ways in which museums can help to ensure that the value side of the equation is enhanced in a fashion consistent with this conception of sustainability.

A major millennial project at the Science Museum, Making the Modern World Online, helped us to pose the problem of sustainability for digital products in the UK museum sector. MMW-O was a huge investment and an equally large experiment, conducted at a time of rapid change in technology, digital literacy, expectations and habits. The sustainability challenges it faced over the course a decade, and how it dealt with them, offer a relatively long perspective for making

comparisons with more recent museum digital activities in the UK, which still face a very fluid environment. With this historical reference point we introduced our primary research question: *what affects the sustainability of the public-serving digital products in museums?* Following on from this were some secondary questions: *Does value affect sustainability? How are the decisions made that determine the future of a product, and what might interfere with the decision-making process?* The scope of our ambition was limited to UK museums, and only digital products or services aimed somehow at directly addressing external (public) needs.

The history (and prehistory) of Making the Modern World Online revealed a project masterminded by a group of individuals aiming at nothing less than a creative new model for the web-based publication of narratives. The specific challenge was to complement a grand new gallery space in an online experience, but without attempting to replicate it. By targeting several areas of hot political currency – education, access, and the internet itself – they secured generous funding from the government, predicated significantly upon the idea of "investing to save". MMW-O's subsequent history was one of great success followed by gradual stagnation, but we saw how even today the website attracts great numbers of visitors, even whilst it shows its age. It pointed us at some more specific questions about building and running digital products: what kinds of risks are there and how are they handled? What is the role of stakeholders? How do organisations understand value? And, is it really enough merely to keep a resource going, or can we not count that as "sustaining"?

We then turned to the wider UK environment as it has evolved over the past decade, arguing that the circumstances in which museums sit are constantly in flux and consist of processes and trends that are often interconnected and unpredictable. These include financial constraints, social norms and expectations, the law, government policy, technology, market players, the activities of peers and the development of the idea of digital heritage itself. This environment offers challenges, opportunities and possibilities that inform sustainability-related decisions.

Armed with an exemplar product, a set of questions, and some background on the UK context, in Chapter 3 we turned to a fuller exploration of the problem of sustainability itself, which we had defined as meaning the continuation of an activity, a process or the ability of a product (or service) to serve its purpose. We teased it apart from preservation and surveyed the research and literature of the last 15 years pertaining to digital sustainability in a cultural heritage context. Value and resources mediated through decision-making emerged as three vital elements in this conception of sustainability, and each of these demanded a deeper discussion for which we turned to a range of theoretical and practice-based literature, mainly sourced outside the field of digital heritage. The mainstream museological tradition offered rich perspectives on how the idea of value relates to collections, for so long seen as at the very heart of a museum's worth. Collins, from a business studies background, and Weisbrod and associates working in economics threw a different light on value, drawing lines between the importance of mission in a social enterprise, the role of its stakeholders, and its success. We were thus led into considering public value and instrumentalism,

which have in recent years become embedded in the discourse around the function of museums (and other social enterprises). Finally, we identified internal "operational" sources of value as being potentially significant.

When we turned to resources – the raw material for value production – an economic perspective helped to draw a distinction between "natural value" and cost. Two further crucial distinctions were made: between generic and factor (specific) resources; and their location either within or external to the host organisation. We suggested that, depending upon their location, the nature of the cost of a resource may vary, with internal resources being seen mostly in terms of opportunity cost and external resources in terms of an exchange. A full understanding of cost entails reconciling these differences.

For the purposes of this study, decision-making was characterised as a process of selecting between alternatives when designing a value proposition, creating the mechanisms to deliver that proposition, and procuring or allocating the resources to enable this. A set of basic ingredients was proposed – an agent, a decision-making process, a set of desired outcomes, choices, and information (or its lack) – and a categorisation of decisions proposed, grouped around value, resources, lifecycle and implementation. Informed by the organisational science of Simon, Barnard and followers we considered who, from within and outside a museum, actually makes the decisions that affect it, and then framed the problem of information: its measurement and the accumulation of knowledge, and the hazard of uncertainty, for which we also turned to psychological research. Turning to the wider environment to which decision-making must refer we introduced the work of Lessig, working within the context of legal studies, which

offers a practical way of thinking about the various forms of constraint that regulate behaviour.

Chapter 3 closed with a model of the sustainability dynamic, in which the product, the resources required to "power" it and the value it produces are linked in a cycle that may or may not be able to perpetuate itself. Decisions are involved at every stage, and any given product may have many complete or partial cycles of this sort which, together, constitute an overall picture of sustainability. We proposed that various distortions might creep in though the quality of these decisions. The dynamic shares much with Collins' "flywheel" model and the work of Ithaka and, particularly, the BMICE report, but is novel in its emphasis upon decision making and the way in which the parts of the cycle might be disrupted.

The Museum of London furnished our first case study, presented in Chapter 4. Its Collections Online project delivered in its first phase both infrastructural software and two user-facing outputs, and offered an insight into a medium-sized organisation attempting to balance immediate needs with potential longer term rewards. A degree of turmoil at the museum presented a challenge during the build and afterwards, but we saw overall a product that appeared to have developed a promising degree of buy-in internally and has, in 2012, started to deliver on its promise. Through the case study it became clear that flexibility in the value proposition was seen as important in maintaining its equilibrium over the long term; that the software's worth was intimately linked with the museum's content; and that project-based funding can pose problems for developing both resource and value models that will work in the long term.

At Europeana, a project several orders of magnitude larger than MoL's, everything was more complex, from the motivations to the stakeholders, from the nature of the resources required to the vision for success for which they were needed. We traced the genesis of the product back to the early 2000s and saw the strong role played by politicians, but most importantly the critical need to build a partnership that shared enough of a vision that all would agree to contribute what was needed for any of them to benefit. Huge technical and financial challenges presented themselves, but also barriers relating to licensing and to the normative behaviour of memory organisations, which each threatened to interfere with either the hoped-for value proposition or the ability to secure the resources – notably the digital content – essential for its functioning. The strength of Europeana's partnership and the relationships of commercial and private users of the service were understood to be of fundamental importance and much emphasis was thus placed upon the brand, in part, we hypothesised, to reduce the perceived uncertainty experienced by some of the stakeholders that were being asked to commit themselves to a project around which there were still many unknowns. Europeana developed its approach to sustainability through its business planning activity, identifying the needs of a variety of stakeholder groups and drawing connections between the inputs and outputs each would be party to. The strategy addressed four key areas (*aggregate, facilitate, distribute, engage*), and with each touching upon both value and resources they offered Europeana some flexibility over the medium term. In many ways, then, the project seems to have been run in a near-ideal way for ensuring the best possible balance between serving the ambitions of its key stakeholders and resourcing itself; only time will tell, however, if this translates

into longevity. One thing that Europeana showed us is how difficult it can be to understand (and influence) how and where mission-critical decisions are made. Whilst Waters (2004) proposed that partnerships might be a way of ensuring that digital products were built and run better, it is also clear that they introduce a great deal of complexity too.

Having passed through our case studies, Chapter 6 allowed us to reflect upon what they meant for the cycle model and in particular to consider some of the ways in which sustainability can be disrupted, either through interfering directly with the balance of value and resources or by distorting decision-making so that sub-optimal choices are made. An economic perspective upon agents was offered, in which we argued that organisations driven by social value (including museums) often make (or should make) choices with the mindset of consumers rather than producers making capital investments for which they can hope to recover costs. We reviewed how Lessig's "modalities of regulation" had presented themselves in the case studies – perhaps most interestingly in the case of Europeana, which has started to influence the environment within which individual museums sit, changing their regulatory constraints in various ways – and we briefly returned to the UK context, looking at its evolution with an eye informed by Lessig's theory. Some "frictions" were examined, many of them connected to the problem of decision-making under conditions of risk, and we returned to organisational science and psychology for some insights into what we had seen, especially with regard to how agents deal with uncertainty, then pointed at some recent research on measuring impact. Barriers to entry such as non-productive costs were identified as economic frictions, along with the

partitioning of resources, noting however that this can also have benefits in terms of the ability to make decisions. Finally we noted what many others have previously observed: that the phase-shift from the objectives of a project to those of an on-going programme or service can be very difficult, even if in our case studies it had passed without obvious trauma. These observations on frictions were knitted into the scales and cycle models of the sustainability equilibrium and dynamic, and then we offered a final comparison to the work of predecessors in this field: Ithaka, CLIR and especially BMICE. We rounded out the chapter by returning to Making the Modern World Online to reconsider how well it had fulfilled its stated objectives and what lay ahead of it. As it transpired, NMSI's plans in 2012 included reusing the majority of MMW-O's content, a proposition made considerably easier by some of the choices made a decade ago whilst the original project was in its planning stages.

THEMES AND RECOMMENDATIONS

The purpose of this study was to investigate how heritage organisations make the important decisions around sustaining their digital products and activities. Our primary intention was not to identify the specific problems or challenges that cause products to break or otherwise grind to a halt in serving their intended purpose; however along with the problems inherent in actually making decisions we have also talked about many of these primary challenges. In this section we will pick out some of the aspects that have emerged as themes of the thesis and venture to propose some ways by which the museum sector might tackle them and improve the prospects for its digital resources.

7.1.1 CHANGE, UNCERTAINTY AND OPPORTUNITY

This research has returned repeatedly to the problem of uncertainty and risk, and its impact upon decision making. A lack of certainty acts effectively as a cost, obliging organisations to find ways to mitigate risk or to expend resources on improving their information and their confidence in the predictions they make. Because uncertainties exist in all areas of the value creation cycle, from inputs, to their costs, to outputs, to their impact and value, and because they compound one another, they can be a major constraint and net cost on decision-making. Thus, any way in which these uncertainties can be reduced can greatly strengthen the case for investing in a digital resource, whether building it from scratch, maintaining it or seeking to improve it. But uncertainty is the partner of change, a source of both challenges and opportunities, and attitudes to both should be linked if an organisation does not wish its digital offerings to stagnate and decline.

Where uncertainty is a threat or a cost, there are two broad areas for improvement. Firstly, subjective uncertainty is reduced by increasing the accuracy of predictions. Even if the chances of undesirable results are still high, where a prediction is made with greater confidence, risks can be evaluated better and the costs of uncertainty reduced. This requires improved measurement and evaluation, an area of active work, [199] in order to assess current performance and estimate it for the future. Increased knowledge-sharing amongst institutions is also important, as is knowledge retention within them – a need to build teams or networks of trusted partners with true longevity (see 7.1.4, below). Research and development projects of the sort currently being

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[199] See for example that of Tanner and of the Culture24 research project cited in Chapter 6.

supported by Nesta[200] are one way to develop and share knowledge of the higher-risk, cutting edge technological possibilities that may appeal to museums, but by their nature there will always be a thinner knowledge-base about their effectiveness and a greater associated risk.[201] It should be remembered, though, that technology is rarely the only (or greatest) risk: failure may also come if a given technology is not accepted by society, or if the products created using it are unimaginative.

Secondly, there is the mitigation of objective risk, which can occur either by reducing the chances of undesirable situations arising or by reducing the impact of their doing so. Again and again issues arise for museum digital initiatives that demand additional resources, threaten their availability, or affect the value proposition. But risk is as much about opportunities that are there for the taking, which are every bit as subject to flux. Technological change is one of the most obvious constants for the digital museum, and often results in new ways to deliver value or reduce costs. But it can also lead to a decline in the perceived value of existing assets, and as older technology becomes unfashionable and unsupported it can become more expensive to maintain, just as it becomes less stable and valued. Social change, meanwhile, may encourage different activities as digital culture grows in importance and habits become established (for instance the use of social media). But it can work in the opposite direction too:

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[200] In 2012 Nesta's "Digital R&D Fund for the Arts", provided a £7 million fund run in collaboration with the AHRC and Arts Council England. http://www.artsdigitalrnd.org.uk/.

[201] It is interesting to note that the ISB, which funded Making the Modern World, was explicitly addressed at bridging the innovation gap that resulted from risk aversion in the public sector, which was described as an "institutional failure" (Segal Quince Wicksteed Ltd, 2000). The problem is clearly neither newly recognised nor solved, over a decade later.

those museums that invested a great deal of effort in Second Life[202] around 2005–6 now find that, although the technology remains, the crowds and the buzz do not, undermining the value of their work and the worth of continuing to invest in it.

Addressing technological risks is a balancing act. By choosing established technology a museum may reduce its exposure to the risk of it failing from a purely technical perspective, but equally such conservatism may compromise the value proposition. Building flexibility into the product may help in both cases, and not only for addressing technology risks. This might entail designing a broad-spectrum value proposition, for example to encourage alternative uses for the assets, or building products that can switch to alternative resources – whether this means other sources of revenue, different software, another source of user generated content, or something else. In both our main case studies we saw a focus upon enabling the reuse and distribution of content to open up the possibilities for value creation. There are technological and social trends that may help here too – from the spread of open data and the hacker culture, via the semantic web, to some degree of consensus currently emerging within museums around licensing and copyright. Museums that can think creatively about how to use such approaches may build flexibility into the sustainability lifecycle, both around the factors that can break a product and those that constitute new opportunities for value or resourcing. Such flexibility may offer a powerful way to mitigate risk.

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[202] http://www.secondlife.com.

7.1.2 THE NATURE OF FUNDING

Another recurrent challenge for museum digital products is, of course, one of

funding. There is little excuse in 2012 for investing significantly in a product

without having in mind either a projected lifespan for it, or a plan for how it will

be supported financially (and in other ways) during that lifespan.[203] Yet the

problem of shifting from project to programme mode remains a live one, as the

Ithaka S+R studies have shown so powerfully (Maron, Smith & Loy, 2009; Maron

& Loy, 2011). This is tied to the nature of support for digital activity in museums,

which all too often appears to lack sufficient core funding and is obliged to seek

project-based external funding for developing resources from which, it is hoped,

the institution will benefit over the long term, but which then find themselves

with no visible means of support. This perhaps reflects a still-awkward

relationship between old institutions and new ways of delivering their mission.

Museums need to develop a realistic understanding of the cost of running their

digital resources in such a way that they continue to realise their intended value

after the build phase is over, just as much as they need to understand that value

deeply. They then need to translate that into core funding – just as building

maintenance and collections care have core funding. The stability brought by this

alone reduces at a stroke the uncertainty a museum faces when planning its

digital programmes for the long term.

7.1.3 COMPLEX STAKEHOLDERS

One further recurrent challenge in our account (and one tied to the problem of

leadership and vision) has been the variety of stakeholders to which museums

address themselves, or could choose to do so, both for seeking resources and as

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[203] with the possible exception of pilot studies, for which it is perhaps forgivable if the intended lifespan is initially unclear.

audiences to which they hope to offer something of value. As ever, this is both a problem and an opportunity, and the nub of a complex set of decisions. With technology opening up many potential new audiences, donors, or participants, the challenge is amplified for the digital museum, but it connects right to the heart of how the whole organisation views its role: who it seeks to serve, and how it wishes to relate to those who may not be its primary audience but nevertheless have an interest or something to offer. Such meta-decisions help to determine how other, more specific decisions will be reached further down the line. One might even argue that for many museums the widening of their stakeholder community is amongst the most important of all the changes enabled by digital technology – at least as great as the new things it makes possible for the first time or the things it makes easier. But as we suggested in section 3.1.3, an accompanying challenge for museums is knowing how to translate external value, as experienced by an outside stakeholder, into value as understood by the museum itself. Getting to grips with these issues is a necessary step for an organisation seeking to make good decisions in building and sustaining its products.

7.1.4 *DIGITAL CAPACITY AND LEADERSHIP*

As we discussed above, reducing subjective and objective risk means gathering information and reducing the vulnerability of products to disruptions, and maximising their ability to use new opportunities. But to do both of these effectively requires something else: an understanding of digital technology and culture within the organization, enabling competent leadership and a vision of how it can contribute to the mission. The information that is gathered to support decisions must reach the parties who make them (both inside and outside the

organisation), and this mandates good channels of communication between those people that understand digital media, and those directing resource allocation and institutional priorities. The fact that stakeholders typically reside in many parts of the organisation also means that digital projects run the risk of being pulled in the direction of one part or another – a phenomenon hinted at in MMW-O, where we have seen how the project team and the web team had different priorities. Digital media within museums requires capable advocates and explainers to help avoid these problems and to demonstrate how technology can contribute to the strategic aims of the organisation as a whole, as Stein (2012) argues. Lacking these, institutions with a poor understanding of digital media can fall back on more familiar indicators of success, such as money, simple metrics around visits, or mentions in the press; or they can find that digital programmes are unduly influenced by a single department.

Organisations are currently engaged in this battle to develop and retain digital expertise and leadership, as we saw in section 2.1.8 when we reviewed the current status and fit of technology in museums, and when in Chapter 4 we examined the challenges that MoL faced until recently. Parry (pre-publication) interviewed digital leaders in a number of UK national museums, revealing how they saw the importance of their role in guiding their institutions towards a holistic approach – a "postdigital" position, as Parry refers to it – in which the digital turn is so completely integrated within the organisation that it is no longer a separate activity but becomes a natural dimension of everything it does. This in itself requires leadership, both to guide the organisations to this position through education and acculturation, and to marshal a coherent suite of digital

activities throughout the organisation, even if, paradoxically, this means that there is no single "digital strategy", as some of Parry's subjects advocate (*ibid.* See also Stein, 2012). The lack of such coherence may leave a museum in a position where its resources are not organised to act across departments for a good of the whole organisation, where it fails to retain knowledge of opportunities and systems, and where as a result costs may be higher, opportunities for value creation will be lost, and decisions will be poorer – all of which sap energy from the sustainability cycle dynamic. But as Scott (1990) points out, leaders have both cognitive (decision-making) and cathectic (motivational) roles, and the latter is crucial to inspiring individuals to "develop faith in and commitment to the larger moral purpose" of the activity they are engaged in (*ibid.*, p. 41; see also Suchy, 2000) – that is, their interests are aligned (to use Simon's term). With empowered leadership offering a clear direction (ideally to a stable workforce) such an ethos can take root, strengthening motivation, as well as building a common understanding across departments (Royston & Sexton, 2012).

LIMITATIONS OF THE RESEARCH

Our field research was restricted to two full contemporary case studies in which the author was embedded and where, subsequently, there was access to comprehensive archives and individuals in various roles, together with a third historical example for which the author had access to some of the archives and accounts and to some important participants. Although Europeana and the Museum of London are very different organisations and the scales and complexity of the projects equally divergent, two case studies alone can reflect only a tiny fraction of the range of digital products that museums are building

(both of them being intended to provide public access to collections), and probably represent a minor sample of the challenges they face in sustaining them. This without doubt limits the lessons that can be drawn from them. Nevertheless it was judged to be preferable to present a small number of case studies in the fullest possible depth than to sacrifice depth for larger numbers. Our expectation was that greater insights would be found by examining the finer details of each case study than by increasing their variety. It is also important to note that, because of our particular interest in how resources are secured and how decisions are reached, the studies were selected primarily in order to show variety in their resourcing requirements, in their stakeholder communities, and in how they made decisions. Between the two core case studies (and considering also MMW-O) we observed a diverse range of challenges, especially in terms of how value was understood and how relationships with resourcing stakeholders were managed, as well as in the transition from project to living product. This is important because as our model developed it became ever clearer how important the value part of the cycle was to the resourcing part, even in the case where resourcing decisions were to all intents and purposes made within a single organisation. Whilst there would undoubtedly be more to learn from examining other examples, perhaps concerning smaller products or institutions or involving (for instance) social media, we have been able to suggest the presence of many hypothesised frictions and challenges at work in the cases we looked at.

The methodology followed here did not allow us to investigate further the psychology of decision making, which is an aspect that has been highlighted here

but where it has not been possible to do more than conjecture the effect of certain influences. A study that tackled psychology in depth would have had a very different form and it is unlikely that it could have succeeded alongside the embedded research that was a necessary part of achieving our other objectives. It would also have required a skill-set that was impractical to acquire in the available time. A related observation that also bears recording with regard to our analysis of decision making is that the available documentation did not provide much direct evidence of *how* decisions were reached. It did bear witness adequately well to the formal processes of decision making and the evidence that was available to decision-makers, as well as uncertainties that they sought to deal with. However even the most detailed and observational minutes of meetings do not capture the nuanced dynamics of individuals or groups reaching decisions, and so it is left to us to infer just how this occurred and the mental processes of participants from a variety of more circumstantial documents such as white papers, proposals, occasional e-mails, and indeed the minutes of such meetings.

The research was limited to examining the archives, conducting a number of interviews, and in two cases being embedded within the projects to make observations and participate directly in some of their aspects. Being embedded in this fashion carries an inherent risk of distorting the natural progress of a project, but the nature of the author's role in these projects did not in the main involve him in the critical decisions that we have then examined. There are exceptions, however: the proposal for the design of the CIIM, and the recommendation to select Knowledge Integration's solution were significantly

influenced by the author, whilst at Europeana he acted as an advocate for re-use and APIs and also (to a limited degree) worked with Harry Verwayen on the business model. There was no solution to this conundrum other than to endeavour to act openly and naturally as part of each project; we consider, however, that our investigations at both MoL and Europeana reflected the contribution of a far wider set of agents that just the author, and that the research in itself did not distort its subject, but it is impossible to entirely disentangle the presence of the author from the projects he examined.

The thesis could also have gained from more direct engagement with the case studies' external stakeholders. In the case of Europeana the study benefitted from the perspectives of a representatives of the European Commission and of the content owners (two vital resourcing stakeholders), but at MoL the discussion relied principally upon interviews with representatives of the museum together with the documentary archive, most of which reflected the museum's own perspective rather than that of its funders. The chief reason for not pursuing this line of evidence was that our focus was on the decisions made by the organisations that owned the products or projects. Nonetheless, there was undoubtedly an opportunity here also to have looked further at the decisions they sought to *influence*, and to compare the perspectives of the parties that sought to "sell" a digital proposition with those of the resourcing stakeholders they were addressing who, for their part, wished to "procure" a cultural asset for the good of the wider public.

CONTRIBUTION OF RESEARCH

The research presented here contributes to practitioners and researchers in three ways: through a fresh approach to the meaning of sustainability, together with a conceptual model of it as a dynamic process; through the case studies themselves; and in the form of some practical learnings about the challenges to sustaining digital resource and approaches to them.

Previous studies of digital sustainability have wavered between the preservation of assets and the problem of keeping and financing a product or (more often) a service live. The rigorous distinction offered in this study between preservation (as the maintenance of a state) and sustaining (as the continuation of an activity or process or the ability of a product to serve its purpose) is, to a large extent, novel. Discourse around digital preservation has started to assume a more sustainability-like perspective (using these definitions), and as we saw in Chapter 3 some writers have started to take a more sophisticated and nuanced approach to the meaning of sustaining, too. And yet the firm distinction between the 'preservation' and 'sustainability' offered in this thesis facilitates a more precise discussion of the problem. It better enables us to distinguish between the subject being sustained, the problems it faces, and the means of addressing those problems. It also underpins the cycle model presented in Chapter 3. A static view of this model, as a set of scales, presents the problem of sustaining a product as, in essence, securing a balance between what the product needs and what it can offer. The dynamic view of this is as cycle of inputs and outputs – or a stack of such cycles that reflect the many resource/value relationships concerned with any given product. It is a useful and simple analytical model that, whilst sharing features with the "business model canvas" that was adapted for use in

Europeana, is distinct by virtue of placing the spotlight upon decisions and the external factors that can interfere with the equilibrium of value and resources. The most basic argument of this thesis is that sustainability is deeply affected by these two factors - the ways that people reach decisions, and the ever-changing world outside – and it may prove helpful to approach the problem by identifying pinch-points where either of these could go awry. The model is an effort in that direction which we hope may assist when seeking to understand the present and plan for the future of museum digital resources.

A second contribution comes from the three case studies presented here. Each is of interest in its own right and none has previously been the subject of a detailed assessment of this sort. Although not exhaustive, the evidence we offer is multi-dimensional and unprecedented in its detail. In the case of Europeana in particular – which is likely to be a major feature of the environment for UK museums for years to come – an understanding of its roots, mechanics and motivations is valuable to the sector in itself.

Thirdly there are the themes that we identified earlier. Some (such as the difficulties posed by project funding) are commonplaces amongst the museum technology community, whilst others (such as the need for empowered digital leaders) are becoming more widely discussed. It is hoped that the research presented here can contribute to these discussions, but there are other areas that have emerged as important but which have had far less attention in the museum technology community, and it to these that it is hoped this research makes a significant contribution. We drew attention to the role of uncertainty in decision making, outlining how it is exacerbated by poor information and communication,

a lack of clarity over values, psychological biases, and uncertainty around alternative uses for resources, amongst other things factors. Museums are accustomed to the idea of risk, but arguably it is allowed to dominate their decisions more than it should, and we argued that anything that can be done to either reduce subjective or objective uncertainty will make decisions easier. As a friction interfering with balanced decision making it is probably without parallel. This research also contributes to the debate on the meaning of value in a museum context, attempting to characterise its location both within the museum's walls and beyond and to understand the significance of the stakeholder perspective in this regard. This is one area in which the discussion sought to bring in the perspectives of other disciplines to cast light upon the relationships of museum activities to the people they serve and those parties that support them.

Finally, it is hoped that this very practice of looking beyond familiar sources can help to inject new ideas into current debates. This research has been characterised by an interdisciplinary approach, under the influence of such diverse thinkers as Barnard and Simon, Lessig, Collins, Hubbard, Weisbrod, Kahneman and Tversky, as well as, of course, more familiar scholars and practitioners from within the field of digital heritage and museum management. The contribution to scholarship is theirs, but by bringing them together and finding ways in which their thinking locks together it is hoped that this thesis can help to broaden the palettes of those approaching the questions of resources, value, decision making and sustainability that were tackled here.

In section 7.3 we identified some limitations of the research presented here, and future research might address some of these. Applying the model to a wider range of digital products and services would be an obvious place to start. It would be instructive to look at some smaller products, including those that have less of an infrastructural slant, and some that were funded internally, whether sponsored by the museum itself or a department within it. It would also be productive to examine museums' activities in social media channels, which have no "product" owned by the organisation other than the community they build up and whatever that community creates. These pose questions such as whether the value perceived in the output is influenced by the form of the investment the museum has made, and how an activity or a community are regarded in comparison to a more concrete product.

There is clearly also scope for a fuller examination of the psychological processes of decision making within museums, and indeed social value-driven organisations generally. In particular there may be a fruitful line of research in exploring how attitudes to innovation are affected by psychological biases in organisations where digital media is regarded as a black hole of risk. Another question pertains to the role of psychology in the dynamic that exists between museums and their resourcing stakeholders.

This research touched upon a couple of areas that would require a much wider view of the sector to fully understand. In particular, we observed in Chapter 3 that digital or web strategies are becoming more widespread amongst museums, a trend that we surmise provides a stronger, more explicit framework of value

that should help in making decisions that affect both the short and long terms. In so doing one would expect that they might help to circumvent some of the problems of project-based work, and increase the degree to which museums consider the strategic contribution of the products they build and run. Where empowered leadership is absent, we argued in this chapter, digital activity is compromised in several ways, an argument that is supported by both the theory and case studies offered here but which would benefit further direct testing. There is scope, then, for research specifically into digital strategies and the degree and nature of their impact upon digital programmes and products. An overlapping area of interest is the structure and location of digital activity within organisations, which we have seen varies widely even between organisations of comparable size and mission. Whilst we have argued that this has an impact upon everything from value judgements to resource availability and is thus significant for sustainability-related decisions around particular products, there is a potentially rich avenue of research to investigate how structure (and strategy) affect the overall profile and character of the digital activities in which museums engage.

There is an opportunity too for a deeper investigation of the specific challenges faced by museums in sustaining digital products. One such is the problem of knowledge retention. The Museum of London showed us the problems that may arise when an organisation loses not only the technical skills to undertake work (which may be bought in again), but also the accumulated knowledge and commitment of its digital staff. By embedding knowledge within their own staff and avoiding dramatic staff turnover, museums can realise various powerful

benefits. This research has indicated some of the ways in which the costs and benefits can be seen more holistically but, like the related issue of digital leadership, the sector is in need of research that directly tackles the impact of losing digital expertise or of building it up within museums, over the long term.

Finally, the transition between project and programme has been identified here as a potentially important bump in the road for museum digital products. We have seen the beginnings of efforts to understand this transition, for instance in the research by Ithaka S+R, but it would be productive to use the cycle model presented here to analyse this particular "phase transition" in a number of projects to understand how it affects not only resourcing but value too.

<p style="text-align:center">***</p>

This research attempted to bring a fresh perspective to the idea of sustainability in digital heritage and to inform it with ideas from a number of fields beyond those that the discipline has traditionally drawn upon. The core concepts and model that emerged were then brought to a detailed examination of some major museum digital products and services. It is offered as a philosophical approach that is illustrated and to some degree tested by its application to real-life cases. It is hoped that, by broadening out the sense of sustainability from narrow technical and financial issues and turning it into a problem of maintaining equilibrium through good, justifiable decisions in the face of a mutable environment – an ecological approach, if you will – the ideas and research presented here can give practitioners and decision-makers a useful way of conceiving the challenges they face when planning, building and caring for the

digital resources that have so much potential for museums in the twenty-first

century.

APPENDICES

1 INTERVIEW TRANSCRIPTIONS

All interviews were conducted by the researcher and, in accordance with the University of Leicester's research ethics guidelines, all interviewees had given their fully informed consent, including agreement that their words would be recorded and may be used in this thesis. The examiners requested, as an amendment to the thesis originally submitted, that full transcriptions of the interviews be included in this appendix. For this, fresh approval was sought from each interviewee, who was also given the opportunity to make some minor amendments. At the request of some interviewees, certain sections have been redacted, and some other deletions have been made to ensure clarity and pertinence. None of the redactions and deletions (generally indicated by […]) were essential to this research and have not substantially informed the conclusions drawn in the body of this thesis. Square brackets are also used to indicate some of the questions put by the author and miscellaneous edits and explanations made for clarity (in some cases at the request of the interviewee). They are not used in Luca Martinelli's interview, where the rewording and clarifications were more extensive (but which nevertheless do not alter its meaning).

It is important to note the dates of the interviews. Even by the date of completion of this thesis the situation had evolved for all case studies, in particular for Europeana, and the interviewees' opinions and observations must be seen as a snapshot in time.

A number of other personal communications were also cited (those with Martyn Farrows, Rhiannon Looseley, Alex Bromley and Daniel Evans). Approval was given by these contributors for the use of the specific information, opinions or quotes from the communications that are included in the thesis; however the rest of the communications were not intended for publication and therefore they are *not* included in this appendix.

RB: what you might be interested in is the sustainability of an idea. Because before the website is the idea... I got interested in stories, about using the web as a place for telling stories, and Andrew had got an idea about telling stories about making the modern world well before [MMW-O] [...]

[Around 1994] I went to give a talk at Stanford on the history of biotechnology and afterwards Tim Lenoir, who was the professor, said "that's all very well, but now I'm going to show you something really interesting" [...] He was constructing a history of Silicon Valley in digital form and he was scanning texts. This was done at NeXT computers while Jobs was in exile and it wasn't going on the web, it was going on CDs, and that interested me, because we had a real problem at the Science Museum, which was that we'd never had enough space to do all the interesting stories we wanted; space is very contested and very expensive, and CDs seemed a good place to tell stories. And I came back and there was an advertisement in THES about Frank Colson. [I made an appointment to go and meed the Colsons, [...] Jean took me around. After that a colleague Doug Millard went there. He was interested in how he could make something about his space history using their software [...] Then it's a question of what you're going to make a story about, really, and Andrew is talking to Neil Cossons, our director...

AN: in the 90s we produced a book called The Making of The Modern World [...] It was Neil [Cossons]'s idea and he said "let's do a hundred of our best objects". I was the executive editor I guess. That was quite successful, it was an explicit attempt to make a culturally acceptable coffee-table book out of science and

technology, and in a way it's a shame we didn't keep going with that kind of impulse, but we didn't after Neil left. But he was always saying something like, why do people care so much about what's in the British Museum, why do people care what's in the V&A, they're just baubles, we've got the proper stuff. It was quite a considered point of view. Then we started to finalise plans for the Wellcome Wing.

RB: It was planned since 1911 that there was going to be a west end extension [... Then the] lottery came along and looked as though they would fund it. Neil had a problem with, how do you deal with modern science in the Science Museum given that the Science Museum is full? So he thought, if we build an extension then we can put the new stuff in it and we don't have to have this battle between the new and the old in the existing building.

AN: the other side of that is we had by then a colleague, John Durant, who was a committed spokesman for the public understanding of science and had been brought in specifically to enhance the Museum's role in that. John Durant took over most of the west end development planning and helped drive the bids through for Wellcome and the Lottery, and that's when it became named Wellcome and not "West End".

RB: To get lottery funding you had to have heritage. And the heritage bit was provided by taking out our old transport gallery, which Andrew and I and Neil went around one night and said, this is terrible and it happens to be at the west side of the museum and if you take that out. And if you imagine the structure it's really 1950s power station, it's really a very modernist structure, a very nice

place to make a hymn to the modern and the march. And Neil got very interested in the march of our greatest things.

AN: The transport gallery was tired and there had been various discussions about how it might be refreshed. Probably it was a good thing we didn't do a new transport gallery because I don't think we'd have known what it should be [...] and I'm sure if we had done one we'd have been way off the pace, with all the changes we've had since then with urban vehicles and electric possibilities and so on and a different attitude to urban mobility. And the generation of the idea I don't really think I know but I know Neil started saying, why don't we do the gallery of the book? [It] was doing pretty well. "100 things on plinths, how hard can that be?" sort of thing. So that was the birth of Making the Modern World as a physical thing [...]

Then it fell out that I became the project director for the gallery. My title at the time was either curator of transport or curator of aeronautics, but I became 'Project Director, Making the Modern World'.

[...] I was thinking [things on plinths] wasn't enough...it needed a narrative... [but Cossons] was terrified of tacky contextualisation, historicisation. And eventually I talked about the Making of Meaning exhibitions at the NG: the Fighting Temeraire was one, Hogarth's The Ambassadors was another, where a single picture was put into context very cleverly. I said, why couldn't we do that around one of our icons? And he said, I didn't know you meant that, I can see now that would work.

So we moved on from there. We've a timeline of the things that made the modern world, according to some fairly generous definition. On the right hand side as you were walking through we put the technology of everyday life, which was an invention the team conceived which was to create a 'comparator', so that the idea was, when [something like the cyclotron] was new and epoch-making, what was ordinary and in your home? And on the other side we have a series of 9 bays which I used to summarise as running from Enlightenment to Ambivalence through to 'Defiant Modernism'

[...] we couldn't actually discipline the whole space with a route (like some narrative exhibitions) because the wish was to make the new wing accessible and visible so it had to have quite a lot of clear space in the middle. So it wasn't a narrative, linear exhibition but it has these three linear strands: great things, everyday life and historical supporting material in 9 chapters. So that's where we got to in 2000 when we opened that gallery.

RB : in parallel I'd been working with Frank [Colson] and put together an proposal to the EU for Info 2000 [equivalent of ICT-PSP]. I was going to make a CD. We put together a proposal [...] on the history of medicine. It was going to be on CDs. This was before broadband, this was the era of 56k modems. We didn't get money but we started developing a model of narrative multimedia which didn't really exist. There were a few CDs which will soon be unplayable and non-existent, but there wasn't really much narrative particularly for a wider audience using the scholarship of museums. What there tended to be were still catalogues on CDs...but this was going to be a narrative. Alright so it didn't work. However, post-2000 there was suddenly a lot of enthusiasm for giving money for

multimedia stuff, Britain was going to fall behind. We had made one bid to [a special digital fund of the Lottery] and that was Ingenious, and that proposal was chuntering through. One day we saw an advertisement for Invest to Save, and it was going to be digital things. I thought about the sort of things that we'd been doing with Frank and also the gallery. Could we digitise the gallery, make some digital analogue to the gallery? [The gallery] was open and the team was still there [...] We were going through a reorganisation and many members of the team were a bit up in the air about what their future was going to be. We had a new director who was conceiving of reorganising the museum.

So with the encouragement of the then-Head of Collections, Frank & I put this proposal together using that vision. Frank got somebody who was a game specialist to write it. John Weinbren. I concocted an argument of why this was an invest to save based on the number of ... if a digital visit equalled a physical visit... We had just switched recently from charging to non-charging, the government compensated us for the revenue we'd lost. So they'd worked out that each visit was worth something like £3.70 to the government; that is, the government gave us £3.70 for each visitor. And on the basis of that I could have a very elaborate growth curve reaching a maximum, and I integrated below the curve for the number of visitors. It was all beautifully scientific! Based on questionable assumptions, you might say, but the government accepted it. It followed from assumptions logically that with about 6m visitors overall you would break even, and I thought we'd get more than 6m visitors, which we have done.

We got the money in 2001 [...] Fortunately Andrew was by then available because we had reorganised, so I was project director and Andrew was head of

content. It was going to be managed by MWR. Curtis Brown [the creative agency] was involved[...] We had a meeting at MWR which went really quite well, it was quite sparky. We began to develop this theatrical model, the cinematic approach [...] By then of course the web had come along so we could do things... but it was quite advanced, broadband was just emerging [...] This was only 2002, and most people were still on 56k, but we said, well let's assume broadband will be here, because it's not like lottery funding [where you had to create things for 56k] we had no such requirements here. So it something that was built for broadband before broadband was really widespread.

AN: actually it was a struggle, not everyone agreed with that. There were people championing the accessibility issue here, and saying it will not be available to a lot of people and it's not fair. Some of the internal web people said "it's not fair, you can't do that". I was always pushing to use the maximum bandwidth. I didn't have any particular expectations about the spread of broadband, but I think Tony Blair sometime during this process announced it as a national objective, that broadband would reach everybody, so that was probably a help, but I think we'd already pushed through the barriers and said we were going to do it that way. We used to deploy the CD argument, running interference: we'd say, well perhaps it's a CD then. We'd argue that perhaps you might be able to buy the rich media scenes on a CD.

RB: So we designed one thing, which was your [AN's] Peenemunde. That was the first one, the V2, and the reconstruction was very interesting.

We brought the school in very early on. That was Frank Colson. Frank had these connections at Peter Symonds College, and that was very interesting. Both it

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probably got us the grant [*which needed 2 PSBs*], but it was also really multi-sector. So it wasn't like that later one [National Museums Online Learning Project] which was all museums. MWR made a very good decision, which was that it was incredibly simple, technically. There was no content system, it's all XML. Which meant that it was actually very reliable and very simple to do. Very hard to update but very stable. And working with Peter Symonds was another very good move.

The project had its ups and downs

AN: I remember when it started going to our various consultants and we went through all this cinematic thing with Weinbren. I think it was unrealisable or too ambitious. And when you talked to people then about what the web could do, they more or less said, well you can have anything. And there were all these tempting voices saying you could have anything, look at this advert we did for so-and-so. But I may not have looked hard enough but I couldn't find a model (for the kind of digital publication we imagined).

RB: No. There was no model. We'd been dreaming of something that didn't really exist yet. We'd been thinking about it for a decade.

AN: What I pushed for most within the group was to make it more exhibition-like or publication-like and less web-like – or less dependent on what the web professional model of a web product was. So they [consultants and agencies] talked all the time about searchability, and to some people it would just be a portal and you could skip off anywhere, and I would always say, what's the point of that? Why can't we make something that's coherent, which you are retained by

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because it's interesting, rather than something which redirects you to another source on how dynamos work? Or history, or collections.

So we had a creative production philosophy for it, it was a programme like a TV programme or a book. It was bounded and it was meant to be something that you stayed in and consumed. Like an exhibition in that it had a virtual location and a content scope. But what you did there was something that kind of fell out. I think the web professionals at the time were learning too.

RB: And that's why we won the Best of the Web, because there wasn't a model, and everyone else was hung up on catalogues and hyperlinks and there was a real struggle about what is the nature of multimedia in museums. There was one model where it was a partnership btw curators and multimedia people and another model where it was very much dominated by the IT people. And as it turned out the IT professionals won. So somewhere like MCG is almost entirely IT professionals and almost no curators turn up at MCG, and the same is true of Museums and the Web. But that wasn't clear in 2002. So it could have been much more authorial [...] They could never take over, the authors, because it's technology heavy, but they could have had a much greater voice in other things than they ultimately did. And MMW is an interesting dead end, and interesting route towards a model of multimedia in the museum which was a real partnership between the multimedia people and the museum people. I can't say that all the IT people were happy, because they saw far more money coming to us than they ever had. We got £1.4 million, plus and plus and plus... and this was not within an institution. You can imagine it caused a certain amount of tension.

AN: It may be a dead end in terms of institutional organisation, but in a way, with the rise of the app publication for iPads and tablets, I think it's quite prophetic. I think that the app as deployed on tablet like the Wasteland, for example, is quite like what we were trying to do. Ours is clunkier, because you have to load the scenes manually and there are more buttons to press which we had to put in. But in creative and content terms it's quite like an app and less like a website was back then.

RB: This was really expert-led. This is the opposite model to mashing up [where] you sort of get a machine to integrate two systems automatically, whereas what we were doing was [...] a work of art. I'd been thinking for a long time that the combination of education and entertainment is *not* edutainment, it's art, and this was a work of art.

We recruited Tilly Blyth [out of Columbia University's enterprise to create educational narrative multimedia, Fathom - see http://www.fathom.com/, unchanged since about 2002] [...] You can still see this fossilised on the web, and Fathom is a missing link. Fathom is a very interesting experiment, and Columbia pulled the plug after they'd spent millions of dollars. Tilly was trained on that.

AN: Tilly had a big influence on the structure of the contents.

RB: [...] Fathom was an experiment of combining television with multimedia in a really graphic, narrative way [...]

We stood back as a client as much as we possibly could. MWR did all the contracting with designers, and all that stuff was not our business so far as we could possibly make it [...]

AN: [...] It was a big slog to get to the end [Ingenious was happening at the same time]. But we obviously had a very strong interest in MWR getting to the end. And because no one really knew what a web publication really was I don't think anyone really knew what the budgets should look like at the beginning, and I think it got very strained as a result.

RB: But I must say as far as the SciMus was concerned it cost what we expected almost exactly, and we got a product which was as good as we possibly could have expected and one which was very stable. When it came out the usage of both Ingenious and MMW had very similar growth curves, it was very interesting, in terms of numbers of users which was growing about 50% per annum to a maximum of about 1.5 million users a year.

We're now using a different method of counting so I don't understand where we are now but it's still on the web. It's in our business plan, which is published, to put that now on our modern CMS so that we can update it. [...] The Colsons haven't lost interest in MMW [...]

The disbenefit of putting it all in XML is that it's very hard to change [...] It's now our responsibility.

There were a few corrections [after launch], very few. More snagging, post-launch, than anything else. Because it was in XML, partly, and partly because it was project funded with so much money there was a problem of "not invented here" I think.

AN: And also because we keep doing new stuff and it's old now it doesn't have a high profile on our website, in fact I don't know if you can find it!

RB: It's a bit like galleries. You open a gallery with huge PR, it has a very high profile for a time and then it becomes an older gallery. Websites age rather faster, a bit like dogs, with dog years rather than human years. A website year is probably three exhibition years!

And I should say for the SciMus, we built on the experience when we made Brought to Life. We opened a new medical gallery website. We launched Ingenious and MMW in May 2004 [actually June]. By 2005 we were in conversation with Wellcome Trust about creating a new website on medicine which would draw upon both Ingenious and MMW and it would draw upon the *scene* quality of MMW and the interaction [...] You will see how Brought To Life draws upon the experience of MMW very clearly, has a genetic descendence. Now that launched, the first part, in 2009 and then in 2010. What is striking is, it's very good, but MMW won a fistful of awards, as did Ingenious, Brought To Life hasn't won any yet. And that's partly because MMW was really ahead of the field. Brought To Life has delivered exactly what we promised but it no longer has the novelty. We were asked when we did Brought To Life it was better not to have too much interactivity because kids would get distracted from their lessons. Interactivity on the other hand is what you need in order to get awards now [...]

Part of the complexity [in terms of institutional support] was the director of the time very much supported it, he was the man who made sure that it was launched properly. He left the museum in 2005 so it was very much by 2006 the last director's product.

AN: Apart from that there's a real estate issue. There's only so much room on the home page, and there are always new things so you fall down the queue [...]

RB: [With regard to securing technical support or improvements] we'd been running very fast, we'd been working for years on several new galleries, and that really took most of the museum's attention. And from the web teams point of view the re-do of the physical and online offer.

AN: I've done an exhibition every year or two since then on something else entirely [...]

RB: we've been doing an awful lot, and we went through about 4 directors since then.

[...] It's a bit like museum galleries, I really do think there is a parallel, and the thing about sustainability is, is it still working? And because there was no CMS it is very stable, much more than Ingenious.

AN: That was a great criticism often levelled at it from our own web professionals: that it wouldn't run on the [content] management system.

RB: Whereas Ingenious, which was requiring a CMS, had different problems and different opportunities. But there are some bits of it which just don't work anymore.

AN: If somebody came along tomorrow and said "this is fantastic I didn't know we had this, how do we make a new version", we'd be very happy, we'd start to think about it, but unless that did happen...

RB: But interactivity, social media, all those sort of things are required as well, so that what was cutting-edge in 2004 and really was a question of dreams in 2002, honestly a decade later is...

AN: In my mind we were always making a publication, and I think digital books on tablet in a way are closer to what I thought I was trying to make as the content guy. So if I ever did it again I would be looking at [something like TS Elliot's The Wasteland on iPad, which includes annotated manuscripts, several performances].

So bearing in mind what Robert said about social media and interactivity and the way the web is used, I think it's closer to a tablet publication than current new web production. So given the chance I would certainly do it again but with a different kind of target.

[**JO**: how much do you think you can move across to the CMS? Multimedia as well as text?]

RB: I would only accept it if it moved more or less coherently because there's a synergy not just between the interactives and the text but between the pedagogical components. One of the really interesting features, for instance if you talk about the V2, is the school stuff on the V2 where you work out what angle... how you introduce Newton's equations... The product which involved not just the museum work but also the school work enabled somebody to see the equations in quite different ways. What angle do you point a V2, to optimise its range against Britain? It makes learning Newton's equations much more interesting than they ever were. You could see what happened to the trajectory and then you related it to what was happening in Peenemunde, which was the same thing.

[...]We've been talking about [it running on the CMS from shortly after the launch]. There was one option about CMS selection that in the end we didn't go down, which would have been simple but wasn't suitable. It took a lot longer to choose a CMS that we thought. Which was quite fortunate because CMS in those days were much more primitive than they are today. Even today, as you know, they're a pain. Tilly was quite dismissive that we didn't have a CMS [...] as it happened I think it was fortunate, for the purpose of sustainability.

[how about sustaining the relevance? Such as changes in national curriculum?]

RB: One of the things that was interesting was, it was designed for A level general studies, which I think it met but it was being used by a much wider range of teachers. It became for instance very popular in the American university system, and it was the president's choice at the University of Texas. A lot of what we do has been very successful at the global level. Brought to Life has had 37% UK users & 37% US users, also growing at 25% per annum.

One of the things that I think the web can do is enable us to escape from being a museum in the southeast corner of a small island. If we're going to get global funding then we need global users. And things like MMW bring us a global usership [...]

One of the things we might have to do if we were going to develop this is to address the question about British versus global styles. Many of the examples are British because they draw on our collections. If you're going to deal with a global audience, to what extent do you make this collaborative?

I would like to do that [in partnership]. I put in a bid to the EU last year that we didn't get last year, which is a collaboration with 10 European science museums, so that we get a much broader image base and knowledge base, and we also solve some of the translation problems. So there are a whole range of problems that need to be solved if we do that collaboration, but if we do then you can create things like MMW at a global level with us close to the centre, because our experience is very important but not all that there is!

[...] In parallel with the gallery opening we wrote a book, Inventing the Modern World - Andrew and myself and Tim Booth and we had a contract writer, Simon Niziol, who came from the LSE – which developed some of the themes [...] Half the pictures came from our collection and half from Hulton Getty. It's beautiful, it was intended to be on the model of Picture Post. But we couldn't get it translated because people said "this is too British" [...] So one of the challenges we've got is how do we make our next products really international, global. But we'll address that.

[**JO**: Who have you had to report to since launch?]

I think we had to report to the Treasury early on.

I think we had one or two updates initially [...] But we haven't had to report to anybody. Partly Invest to Save – we made a presentation and we made a report but it wasn't like several years afterwards with the Lottery fund.

[**JO**: The PID to ISB it talked about other outputs from the content, but they didn't chase you about the side effects?]

I think the school were very pleased.

[**JO**: they were seen a client rather than really as a service provider?]

Absolutely, it was a real partnership [...] Nearly everybody that used the product wouldn't see the gallery, but also to motivate the school they had to be seen as full partners, not just service providers. They were absolutely full partners and that was really important to motivate them

AN: They had quite a lot of work to do. There was a question about [...] whether you could virtualise a gallery and so you would have to give the web product a virtual geometry or spatial arrangement that reflected the themes we had done in the actual gallery; so that you suggested the visit, as it were. We didn't do that in the end.

RB: I think there was some discussion [of that]. We felt that this was a coherent product in itself, and there was an advantage both artistically and in terms or our relations with the school that we kept it that way because it was something that we had equal stakes in. In the end the museum had the copyright on everything, the school was very generous and didn't make any fuss about copyright, which was much simpler. But we were equal partners; the pedagogical side took as much energy, sometimes more, from the management team. The curators were pretty productive. But when we had our 3-monthly meetings the big issue was, are the school keeping up?

AN: It wasn't fair! We had a dedicated team...

RB: ...and the teachers were having to do this in their spare time. So it was clearly a requirement on us to motivate them and to make them feel that they really had ownership of the product.

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[**JO**: what was the overt incentive for them?]

RB: One was that they got high prestige, that they were partners in a successful product working with the SciMus. I think also that they got a teaching product

AN: And they had a reputation as a leading A Level college and saw this as a part of their mission.

RB: They got money but it was spare time. [the authors] got some extra remuneration but still, it was hours when you should be talking to your partner or putting the kids to bed. But on the other hand I think it really benefitted the product, it transformed it. It's fun but earnest.

AN: Possibly looking back now [...] there may be too many ways through it. You have the stories timeline and the learning modules, then you had objects, icons...

RB: Now, you could say, we'll do it differently, but we had to invent something that had never existed, and we had a creative bunch of people doing it, and it took everything out of them [... It slipped] by a couple of months. Ingenious and MMW slipped by about the same amount. And it was partly for these poor teachers. They'd agreed to do something and they had no idea what it was.

AN: I think we took on [...] a very heavy reporting load during the project. The project progress report.

RB: [...] Our proposal to say we were going to use PRINCE 2 was probably helpful in getting the money but it was new for museums to use PRINCE2. I don't think the Science Museum, certainly on IT projects, had ever used PRINCE 2 before. We got to use it more, but we adapted it later [...] But it was much lighter.

AN: The reporting has a cost. Actually a very high cost, if it is done to the level of detail at which it was being done.

RB: [...] it wasn't so much the reporting, it was the amount of effort going into the initiation document was huge. So you spent a lot of time and money creating a document which wasn't a website.

AN: I came out of a luxurious world where it was more or less, give me a pile of money and I'll make something nice. That was the way the exhibition budgets worked *at that time* [...] [With the website], you're reporting on intangibles a long way ahead of schedule.

[**JO**: is that one of the overheads of it being a partnership, where there's trust but you also have to keep it accountable and transparent?]

AN: I would have almost preferred to do it as a series of pilots, and make each pilot a real thing as we moved onto the next one [...]

RB: Within the team there was very little aggro: battles over software or things not working, which we'd had in other projects. Things tended to work.

[**JO**: do you think the investment in the overhead paid off?]

[...]

AN: I was very uneasy about the system. I'm naive financially and I don't generally get involved in the project management side [...] It just felt to me that it was a very heavy cost [...] It's no-one's fault, really; as Robert said, doing it that way was a condition of getting the money [...]

[**JO**: did you get a different product because of it?]

RB: no but I think part of it was that it ended very messily. And mwr paid a very heavy price because they were ultimately the risk-carrier. The whole thing had been set up so that we would bear the minimum risk and they would bear the maximum risk, and from our point of view that worked out fine. From their point of view it didn't [...] They didn't try to change the rules [...]

AN: I would probably say that if the project management and reporting had been done more lightly there may have been more money for what went on the screens.

RB: [but] there were very few occasions when the limitation was money. One of the complexities of this is that the Science Museum was reorganising through this. So people were being made redundant during the process [...] This was a time of radical change in the museum. Fortunately, all the people who stuck it out were well recognised afterwards, and the museum were very appreciative [...]

We had agreed a price for the job and an awful lot of the money seemed to be going on PRINCE2 stuff, but we said, that's your business not ours, and we got exactly what we had paid for. Now it may be that as a result a lot more funds had to be found from elsewhere [...] but that wasn't our business [...]

There was a lot of luggage that was brought by mwr to this [including Microcosm, the precursor software] and we could work with them. With many organisations it would have been impossible to bring this curatorial, exhibition perspective [...] There was a lot of expertise they brought so they could hear Andrew and facilitate it, make it possible, rather than arguing with you, like

many other people would have done and said, you can't do that. Instead they talked with you in a way that you could engage with [...]

AN: It's perfectly true. They supported us when we had these discussions with our internal people, "was it a publication or was it a site?", and the degree to which it was narrative and self-contained, and helped our colleagues to see the point of that.

[JO: you took over from Darryl McIntyre]

CR: I think the whole thing is post-Darryl actually... yes it did start when Darryl was there but it was very much part of the Capital City programme, and it started out as, it was going to be a little microsite going with the Galleries of Modern London, but then I think it was Claire has the credit for saying, "hold on, we don't want another microsite", because it was just obvious. Because I certainly started in with, in my naive way thinking "oh yes, we've got to get it all online, it's just another microsite", and that's why it wasn't really budgeted for in the original Capital City budget because the vision, if you like, was just another microsite, which we'd just double-up on the content, so it was just another re-purposing of existing content and not a whole technical side. But it was Claire who raised this idea that if we're doing this let's actually do it properly and let's move it onto another sort of project. So that's when it became not budgeted for in Capital City.... so it was sort of, not agreed but...we'd committed to doing something online as part of the Capital City, so it was a deliverable that we'd get all the stuff online. Once Claire had put forward a proposal that actually what we *didn't* want was another microsite we wanted to do it properly, then there was a budget implication because it needed the technical side. So it was then costed up but treated as a sort of add-on to the Capital City budget so although it wasn't in the original budget it did get added on, and I think ...a bit of Hub money was sort of shunted towards at one point.

That initial cost became under the Capital City umbrella and that was the Phase 1, just to get the technical side up and running

CR: Yes that was all after Darryl had left. I can't quite remember the sequence of it but...maybe it had turned into something bigger than just a microsite also after he left.

CR: Me, with my Capital City... you know, chief curator of Capital City, so therefore responsible for the delivery of content, as it were. And it was also made I think to Collections Committee, I remember it being discussed quite a lot, at a time it was being project managed by Louise [Doughty].

[CR refers to minutes of Collections Online and Capital City board meetings. Confirms that Collections Online project board existed in spring '08]

So it sort of started off in 2008. In 2007 we were still working on this thing called "digital databases", that was part of the Capital City plan. It was going to be on the web but also in the galleries, there was going to be, like Collections Online, digital databases, so near to the suffragette display there would be a computer where you could find... So that was a vision as well. But the partly when the design got a bit more fixed up at one point...Design said "actually, look, there's going to be no room for these things", we had such problems with trying to fit everything in. So the idea of actually having computers scattered through the gallery went, and then it became....that the SH would be much more of an "information zone". So the fact that the Collections Online terminals are there is a sort of relic of that. The idea was that it would be a cafe, and then it was going to be an internet cafe. At one point the Lord Mayor's Coach was going to stay there,

and then another coach was going to come in... all sorts of things were decided for there!

So 2007. 2008 it must have become the Collections Online project that we wanted [refers to documents again re Hub-funded digitisation officer (Emma Campbell)]

[JO talks about the idea that change of physical layout transformed the idea from several separate microsites into one Collections Online]

CR: That was certainly a factor in it. Whether it was *the* critical factor...and which came first, whether it was the design decision not to have the separate things and then it was the Claire decision not to have microsites. Which came first....I think actually it probably was the design.

We were working like mad on these digital databases.

[**JO**: digital databases were a strand of Collections Online?]

CR: Yes. We were always worried right from the word go that the Heritage Lottery Fund, who were funding most of Capital City, were very, very obsessed with object numbers; that they were giving all this money and actually, were we going to end up with less objects on display than the old gallery, which was an issue. So in a way, getting the digital stuff in there was partly to say to the HLF "well, we are improving access through the digital access". Because if we didn't have that... As it turned out we have got slightly more objects on display than the old galleries. Buttons, and all the images that are on Mike's thing...[*laughing*]. So it was partly that as well.

[we look at some documents, CCPB meeting from 2007 re object numbers etc]

CR: That's right; we put in a project bid [& got Emma Campbell]. So, we got her, and then she got extended with Hub money.

May 2009: "it is our recommendation that we use the opportunity to frame a new approach for all collections delivery online." So that dates it... "Overall aims: as well as meeting the requirements of the HLF funding..." then we go on to the Collections Online that we know and love. Now, where this went to...it was to the Capital City steering group, actually, which in fact was basically EC. Jack chaired it; it was Jack, Kate, Francesca, and Darryl. So I used to sit on that as head curator

And then we put in a project bid and I think once that had been accepted we then needed to get some money to do the technical side. And then it...got bogged down for a while and I think it was 2009, because Louise left and then somehow, even though people had agreed to it, it just didn't progress much.

This seems to be an update in August for EC. This was at the point where it was floundering a bit. I think also it was the money because in order to do the technical side we needed that little bit of extra money, and because there was a lot of worry that... Capital City was in the "value engineering" phase, which is basically engineering back down to the money we have. We weren't quite sure how much money we were going to have so as this was an add-on extra anyway people didn't really want to give the go-ahead just in case we'd give the go-ahead to this and we wouldn't have money to do the pleasure gardens or something like that.

[The phrase "value engineering" is] the one thing I've learnt from Capital City [...] The City gallery downstairs was much "value-engineered". There was a budget to do £100,000 worth of work and value-engineered it down to £50,000 which basically meant saying, we'll not do that, not do that... It's making the project fit the budget available. It's an awful phrase really!

[JO on the "fit" of this phrase with this research because of the importance of the term value, and the focus on how the value of digital projects is explained to/understood by decision-makers]

CR: I think it is, actually, because it's one of the things that once you know it, you really, really know it, as it were, but if you don't know it you just can't quite imagine it unless you have lots and lots of papers like this.... I suppose you have to write it down and you have to lobby and you have to ...just try and be an advocate the whole time and get real examples. I think Collections Online Phase 1 is the biggest argument we've got to go on Phase 2, because people can see it there, and they can see how useful it is and that the Picture Library can get this and the Press Office can just get that...If you don't have those concrete examples for people to actually have a look at then it is quite difficult to convince people, to really make the case. Unless you're in that world...and if you're not in that world it's all far away, it's a distant thing, it's not real.

[JO: with the length of the chain for making the case and making decisions, from developers right up to EC , there were a lot of people that needed to be convinced]

CR: In a funny way, even though Claire would probably disagree that it went through, not in a sort of official way, it went through by luck and chance and catching people on the right day. But sometimes I think that actually that might be the best way to get things through because it also means that people don't...if it's not really on people's radar they don't sort of scrutinise and block things because they don't understand it. I'm saying that because in a way it was the case with all the content for Capital City in that all the debate in the project was about, it's almost like the footnotes...and what we were saying, and the stories...at one point I felt rather aggrieved that nobody was interested in actually what we are saying about the Gordon Riots or something 18th century. Nobody seemed to be bothered. And then I decided that actually it was a good thing because you were just being left to get on with it. [JO: it gives you the curator the space to do your job] ...exactly, without everybody putting their oar in. And I think for Collections Online there's a little bit of that there in that we've ended up, although you have to interact with the whole project system where you need the money, and that's where the problem here in summer of 2009 was, that we just didn't have the money released to enable us to go on to do it. But the fact that people didn't then scrutinise it in detail has some advantages to it. In fact even now I can see it in EC sometimes that people are sort of feeling that Collections Online sometimes is a bit of a cuckoo in the nest because they've agreed to it, we've got so far, but actually they hadn't quite realised what they were signing up for. But actually to do Phase 2 we are going to need an awful lot of curatorial time and we're going to need some money.... You know it's almost like the Museum is being transformed by a project that they didn't quite get the full implications of. Obviously everybody's for it, so I don't want to say ...people are not supportive,

but I think there's a little bit of people who didn't really understand it and just dismissed it to the side and now realise that actually it's central.

[**JO**: you can see it simply as a tool to do the job you were going to do anyway, but it can be more: you can build programmes around it]

CR: Absolutely... I think in this museum, actually....although we think we're forward-looking we're still very building-based and we haven't really grasped the potential for the whole e-learning digital revolution that's happened. And I think, you know, Collections Online will obviously help us [...]

[**JO**: talks of various ways in which MOL has made its name as a digital organisation]

CR: Interestingly all of those things happened because of the drive and enthusiasm of a single person. They were classic sort of bottom-up things, rather than the Museum grasping it and saying actually we're going to do some programmes here. [24:18] And maybe that's the way digital things happen. Because it's things like the blogs, you know, Adam up in LAARC and the stuff they do with the VIPs, it's all fantastic but it's done entirely off their own bat, and I thoroughly approve of that but, you know...

[JO: for the blogs to happen it's because there's some cheap and easy software solution enabling it, which is what Collections Online now liberates you to do.]

CR: It is transformational, Collections Online, actually. We've still got a lot of work to do on Collections Online....and then we can start planning. I'm sure once it's up there the Museum will start to be transformed just because people will do things, people will use things. And then the arguments about how we operate in

the digital environment, we won't need to be quite so shouty about it because it's actually there and people will accept it and people will forget that they ever thought that it wasn't the right thing for the Museum to spend money on. Sometimes, partly at the moment because of looming cuts and things, and just occasionally you hear people saying things and you think, "gosh", you know: saying things that sort of imply that the Museum *is* just the building. And you think, "gosh, what world are you living in?" And if you're cutting back you have to cut back to the "core" and the core is just the things that happen in the building. Anyway...

[**JO**: what drivers from CS's idea sold it to CR?]

CR: I suppose it was just almost, if you like, the practical business efficiency side of it in a funny way, and it just seemed so obvious and I remember being shocked as I think everybody was at the number of microsites, like over 90, I mean that just seemed ridiculous. Just on a common sense level you could see that that wasn't sustainable. And I suppose partly for myself, as I was getting more, with my curatorial/historian's research hat on, getting more aware of how historical research, which has been transformed whole-sale [*sic*] by the web and things like Old Bailey Online where you could search, you know...Almost every 18th century text now is searchable online. It just seemed, the whole argument of being able to search across our collections, just seemed the obvious one, that rather than searching in every single microsite. So there was sort of a common-sense argument that this just seemed a much more efficient way of doing things, sustainable for the future. [28:52] And it was almost like, why haven't we thought of doing this before? But then, I'm completely at sea with the technical

side and I understood that it was only now, at that time, that the technical thing was...that early museums who'd done this, like the Tate and the V&A, that we could learn from them and get the next generation of technical stuff...

[**JO**: about the potential for sticking a single front end onto the previous databases, but the fact that it also needed the data standards/Mimsy work. Also the ability to do other things in that middle place]

CR: Also I seem to remember being very impressed by the argument of shooting data out to other people as well. Again, that just seemed like the way the world was going so we needed to be on the bus, as it were.

[**JO**: how is institutional support now?]

CR: Obviously we have institutional support and the fact that we've got a big chunk of money from an external funder has helped enormously. Now if we hadn't had that big chunk, that big almost seal of approval from somebody external, I think that the institutional support would be diminished. Because I still think there's a not-quite-seeing the benefits of it and thinking of it as a sort of fringe thing rather than as a mainstream thing. I mean it came up, a very good example of that...we were having a discussion at EC about staff and who's doing what ....it had come up that curatorial people for Phase 2 would have to work on Collections Online and...somebody said "well, but this is ridiculous, we've got a project and we haven't costed all the elements in the project", meaning the staff time. So I said, "But that's what we do normally. For exhibitions we don't cost staff time". And there was a phrase which I can't quite remember, I think I was so cross at it I didn't...but something like "oh well of course exhibitions are"....the

implication was that they were core and this was a separate project that needed to be costed absolutely, and that we shouldn't be putting our core staff onto it because that's not what they should be doing. So I let it go...but I think that sort of attitude revealed that Collections Online is seen as an add-on extra, an optional extra rather than actually central to what we do. For some people, central to what we do is that the curators should be just doing on the public programme, the exhibitions in this building.

But having said that we've started on this project, and because we've got the money from the sponsor, that means that we've got to carry on and do it. [JO: ...and that's not about technology] it's about content. And hopefully the technical, the CIIM and everything, will be covered by the budget for Phase 1, I think, so that should be fine.

[**JO**: have they got particular content areas they want you to concentrate on?]

CR: No, they've been very good actually, this company. They don't want any publicity [...] they don't want any hands-on about what we do. In the pitch to them we mentioned the jewels in the crown of our collection like the suffragette collection and things that would find a market worldwide, particularly in America because they're at root an American firm, though this is the UK bit of it. So no... apparently it's just they've seen we're a museum that's going places and they want to encourage us. Which is great. They gave us the money and we were rather gob-smacked that they didn't want the publicity...so it's a genuine philanthropic thing, unless there's something that they haven't told us yet! They want us to flourish, and in fact the only sort of intervention they're having at the moment is that we've got to come back to them by the 10th of December with a

proper plan for Phase 2, which we've started doing, but one of the things they particularly wanted us to do was to look at the commercial applications. Not in any way that would threaten what we do, but they were interested, I think very much in the sense of how the museum develops; so they felt that actually this might help us develop e-commerce or something or other. ..I think that's the only area where I feel a bit at sea about ...having a plan about how we can do this. In the sense that the things that we digitise, there'll be more available for the shop to put on mugs, that's easy, but whether there's something else that we ought to start thinking through about how we can make the knowledge asset make money for us without compromising our public service ethos.

[MOL did include Picture Library in their pitch to the donor and also the shop] ...but the feedback we got is that they want us to think through it a bit more. So again it them almost being like mentors, so that they're actually encouraging us to just think it through a bit.

[**JO**: Has there been much talk about other opportunities for how to use the CIIM?]

CR: Well again in Phase 2 we were going to think through some of the more technical things, and particularly the interactivity and all of that stuff, but because the [redacted] money wasn't quite as big as we thought, we slightly put that on the back burner which is a shame actually... I don't know how difficult it is to get user feedback, wiki-style, coming in, but that's very much in my vision...it has to happen. And whether that's very easily done with the CIIM or whether that's not so easily done, I don't know.

[**JO**: that would be a bit more infrastructure, but once you'd got it there you could do what you liked]

CR: Yes, and I do think actually with our particular collection that we actually need it because there's so much in the collection that we with the best will in the world will never have to time to research. If we get it out there and get people out there identifying things, even a photograph of an unknown street in London, where is it, somebody out there will know. So some way of harvesting; it's that sort of dispersed research community idea which I really like. So I would love us to move toward that sooner rather than later, but you almost can't start that until you get the stuff out there for people to then start to feed back on [...]

[**JO**: so you've had quite a lot to do with digital projects over the last few years, you've got the bug a bit?]

CR: I think that's true, it is a bit of a bug. Unlike you I've not go so far into the technical...I don't really understand CIIMs and CMSs and everything, but for me I suppose it's where I've got into it I think is what I mentioned before about, as a historian you just realise that for research purposes – although I can see social media happening I'm personally less interested in that – but in terms of research, I remember the first time I could get into the catalogue of the Library of Congress, and I can get onto the Public Record Office catalogue, all of that; it was that that really I think started the spark of: this is transforming knowledge; and that's always what I'm interested in, I think it's about knowledge and sharing knowledge and how we understand things. Wikipedia, when that started, it was just amazing. So that's where I've come from. But I think for me a very big catalytic event if you like, was actually going to the Museums and the Web

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conference in America, which again was when Darryl was here, and Darryl, bless him, he was the one who said I think you should go to this, he was going. And it was an eye opener...you were shown things that you would never think of...I hadn't really come across Flickr, which shows I was not really into that sort of social media side, but then they had their project where they use the Library of Congress photos and you just suddenly realise what a powerful thing this was. So that was 2008. So since then I've sort of "seen the light". And everything that's happened since just confirmed, that is the world we live in. But I've come at it very much from the curatorial side of, it's about knowledge, it's about learning in a very broad way ...I've always loved libraries and I still love libraries but the web is just a fantastic tool for learning [...]

For Collections Online Phase 2, and museums in general, we've just got to get more stuff out there because you can't play with it, you can't do anything until the stuff is out there. And certainly in the historical world, as well, with historians...there's been some fantastic stuff just getting texts out there, making text searchable, and it has transformed...I mean the 18th century studies have been absolutely transformed by digital sources....The biggest example for me always is the Old Bailey Online, where they've transcribed all the stuff, and it's completely transformed so many fields of study about how we understand ordinary people, the working class in the 18th Century because it's just opened doors. And you can see the results; there are television programmes, this Garrow's Law series which is coming, it's all based on Old Bailey Online; the radio things, there's new books, women's history, clothing, everything...because now all the stuff is there and it's real, but it's almost like inventing a whole new

area of historical research, and it's very exciting, and that's why I think for museums to get our objects in there as well – it's almost like we want to join the party, that's why we've *got* to get our objects in there, because as soon as we get them there and they're searchable they can then be integrated into history in the way that they never have been before while they're just sitting on the shelf in Mortimer Wheeler House doing nothing, nobody knowing anything about them. I suppose that's what drives me ultimately; it's just getting the stuff out there and getting part of the history dialogue, which is incredibly exciting at the moment so we've got to be part of that.

[**JO**: How did Europeana come about?]

JC: It was a combination of things coming together at the same time. All of the ideas behind internet cafes, and renting cars online and the kind of things that Stelios [Haji-Ioannou] had. And what he managed to do was at exactly the right time so he was able to take everyone else's ideas and make them happen. In a way I think that's partly what's happened with Europeana because the Commission have striven for many years to get something off the ground and one of the problems in the UK for instance was that they'd already been to the museums and talked about this digital library about 6 or 7 years ago and therefore they obviously thought, "well, it'll never happen, what's the issue?"

[**JO**: was that TEL?]

JC: No this was really the Commission themselves. They tried to get museums and archives interested in bringing their information online and setting up digital libraries and all the rest of it. And the one area that it worked in for the Commission was TEL, the European Library, where the national libraries had a real reason to do it. It sort of stemmed from something they were already doing called Gabriel which was an entrance point to knowing where the libraries were and the kind of things that they had in them, the beginnings of just promoting on the Web really.

[**JO**: a bit like MICHAEL?]

JC: Probably not dissimilar in many ways. ...Very HTML-based. But they put in for this project which was the European Library led by the British Library, and the British Library together with this library [KB] came up with a prototype to actually be able to search across the collections, so to create a unique search point to access the information that is held in digital form in the library. And the idea was always that this was for the digital information [i.e. digitised content] not for the catalogues, but because that was mostly what was digitised that's where it started from. And because at the end of the project they'd also done business modelling and sustainability and all the rest of it, and CENL decided to take it on as a project and nine libraries funded the first tranche of turning it into an operational service. It was hosted here because the guy who was responsible for the technology was based here. And it's at that point they employed me and Julie and Sally I think and Olaf. It was really to set up an operational service. Now the Commission, because it came out of initially Commission project funding, thought "this is great, this is our baby, we believe in it, we've proved that it works", and it has worked, in that we've gone from 9 initial libraries we've now got all 45 of the 47 national libraries across Europe - access to their digital collections information.

Then at the time that we'd got to about twenty, twenty-five libraries with a couple of additional European projects, was the time of the Google Prints initiative, and I went to the Bibliothèque Nationale – it's all happenstance this – I went to the Bibliothèque Nationale in Paris and gave a presentation on why we should use Google as a distribution mechanism...and in order to do that I needed to create a crawlable central index. But the guy in charge then was Jean-Noël

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Jeanneney, and what triggered him most was the whole idea of Google and an Anglo-Saxon world controlling the Web. So he saw it as I think a political opportunity to promote, certainly within France, a need to digitise their cultural heritage and particularly text, and that it should be owned by the institutions not by private enterprise such as Google. He then wrote a letter with Chirac, he got 6 heads of state to write a letter to the Commission at the time to say that it was important to preserve and digitise European cultural heritage within Europe and to foster the multiculturalism of the web and that it shouldn't be turned into an Anglo-Saxon thing. So in a way it was the conjunction of this movement against Google having ownership at the same time that the European Library had begun to prove itself as an operational service and capable of running the whole thing. Equally at the same time was the MICHAEL initiative which was funded under a different DG [Directorate General] which also gave rise to some other politics which was the push for TEL to be the source for the whole thing and that's caused us some problems I have to say. A kind of rift between the MICHAEL and TEL. And it's a rift that's been made worse in a way by politics than is really there, and we're beginning to mend it now and to make it work in the right way.

[**JO**: is MICHAEL still going to have a role?]

JC: I think so....it's quite fundamental. It has a role because it tells you at a collection level what's been digitised across quite a lot of Europe, which is quite useful so as a kind of registry it could be quite a useful adjunct. To me that's probably where it ends but that's for the future and I'm trying to avoid the politics of it.

But because the European Library was the child of the European Union they

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promoted it to CENL and the libraries as the operational body that would be able to take this forward. So it's really this set of circumstances...And also of course that more stuff is being digitised, it's available on the Web, that there was interest for the younger generation of accessing information in this way, or in the older generations. It's all at the right time I think.

The Commission then asked CENL, who owned the service of the European Library, to submit a proposal to create the European Digital Library. They'd already reacted by calling (which has caused confusion later on), but calling the project that brought in the remaining EU and EFTA national libraries into TEL and that was called EDLproject, the European Digital Library Project. Part of that was the beginnings of a road-map of what you needed to do. So the libraries, if you like, took occupation of the space and were in more of a position to do so because it's the only body that at that point had an operational service across Europe, knew some of the issues that surrounded it, knew how to attempt to make these networks work together and what came out of it.

So the Commission asked us to submit a proposal which was EDLNet, which we duly did, and unfortunately won it! [*laughing*] MICHAEL had been the other option. And then we had a hell of a year, really. Because we were then driven by the political timetable of the Commission, not by what's reasonable time to create and launch such a service. So I think it's amazing the we even managed to get it up for ten minutes on November!

[**JO**: how will Europeana address the lack of interest within museums?]

JC: We're chipping away at it, and that then comes down to your return on investment side of things and how do we get them to realise what the ROI is, or

to buy into it in the first place, because in a way you can't even create the return until you've got the critical mass in order to generate whatever those potential returns are. And that selling is...curious. It's who responds immediately, why do they respond immediately, why do you not have to sell so hard to France? Well is that because it had this political motivation behind it in the first place? You don't really have to sell very hard in the Baltic countries or Spain, they're all motivated to be part it, to be part of the greater Europe. But the UK is...it's almost like waiting to see if it's at all successful, and doing a very British thing which is picking up on the criticism rather than the... So for instance the British Museum will join, it's only taken me 2 years! And in the end it's not me that's achieved it, it's Gordon McKenna [Collections Trust] and Tanya [Brannigan, BM documentation]. She was inspired sufficiently to want to push it in the British Museum, so it was the need for this champion inside. Because I had a lot of conversations [...] and got nowhere. "it's too much work, we don't understand what you want, it might fail..." [...] Getting the British Museum will have quite a big impact [in terms of getting smaller museums to come on board too]. To [the BM] it's another distribution channel which they might as well have. Interesting[ly], the trigger for them seems to be the access to the Rijksmuseum, the Prado, the Louvre, which you'd think they'd already have, and I'm sure they do, but not at the level of Tanya and in a way that they can really make things happen, so to create virtual exhibitions or the kind of things that we've talked about. And the Science Museum is the same. Chris Rapley is interested and he's interested because he can see political gain in getting all the science museums of Europe to create a virtual exhibition on space exploration or something. It's good

promotion material, it looks good because you're part of a much bigger party etc. I haven't given up [on the UK], it's fascinating as a case study in its own right [...]

[**JO**: What's the pitch?]

JC: To me it's an aggregator that is also able to be a distributor, so it's a facilitator and an innovator as well. But I think it's also a kind of catalyst so it should be an enabler in that it acts as a place where you hold access to repositories, to language thesauri, to content, to ways of linking [that] content. We're also looking very much to creating a sandbox environment for prototyping in this whole area. So that it gives access to all of the institutions to make use of these things in their own [way], which is the API concept really. I think the usefulness of having Europeana as a flagship, maybe not so much as a destination site but it encapsulates the vision, so you can start to brand lots of things around it. You're basically saying that if it comes from Europeana it's thought about some of the cross-domain stuff, it's thought about the multi-cultural side of it, it's thought about the language issues (it hasn't of course!). In theory that's its positioning. And it should be completely open, all open-source development. We just today agreed to create a charter for public domain policy so that stuff that was in the public domain should stay in the public domain and Europeana should insist on it. Fine, there are always reasons that you have to charge for things and particularly from the museum point of view there will be exceptions, but the principle that it's owned by the tax-payer in the first place means that they should have access to it, including on the web.

[**JO**: does charging always go against public domain?]

JC: No, because there are times when you could absolutely justify it, that you can't afford to hold it otherwise. Particularly things like audio recordings. But it's really trying to say that you can't take out of the public domain that which was in the public domain and then claim it your copyright. There are examples where museums particularly are putting copyright labels on stuff that they just can't have copyrights for. It doesn't belong to them! It's the whole principle that, we've already paid for it once, why are we gonna pay for it again, as a tax-payer? And I think Europeana's in quite a good position to keep pushing that.

[**JO**: Future funding?]

JC: We're going through options in the Commission at the moment and they've decided that they will do a public consultation because that validates their investment in Europeana. So, is this a good thing, does it make our cultural institutions relevant in a digital age? It's all of those kind of issues, that they want to get public validation in order to be able to say, "we should go on funding this", to then be able to come up with a funding model ... and it's very difficult, partly because of the instruments but partly because, if you want all member states to contribute 45% then you have to have all member states agree. And if you do it voluntarily then it's the same old ones and the same ones who opt out, and in the end the same old same old ones that turn round and say, "well why are we doing this for you, you shouldn't be in here", so then you lose your whole " it's a European based...". So the solution is quite difficult

[**JO**: So the consultation could be a great tool for you?]

JC: Yes but even then it might validate that the public want it [to get the core funds], but you've still got to find ways of raising [the balance]. And that then is your sustainability, return on investment, what is it that Member States get out of it – which is all the stuff that we've already got in the business plan and that I think we need to develop...our sales pitches.

[**JO**: so is the biggest sustainability challenge financial, participation...?]

JC: Probably a combination. It is actually project managing a multitude of projects to deliver a service, which is not how you would normally run a business. It adds a level of complication to something that's already quite complicated that you don't need. So in order to create it you've got to run 10 projects each year, which is quite a lot actually! So we almost need a project manager just for project managing the projects!

It is to do with, can you secure sufficient forward funding to know that people's jobs are safe? So you don't get staff turnover and all the issues we've got at the moment of having to train people, get them up to speed, not actually having the facilities to train them or the organisation set-up etc. We've also got a young staff because salaries aren't high. Adds another level of complication. It's great because they're relatively flexible but then you miss the experience and they make really daft mistakes. So therefore it's funding.

And then I think it is politics, it's the flavour of the moment because it looks as though it proves that Europe is Europe, that Europe is greater than the sum of its parts and not just these individual nation states pulling in different directions, moaning over who's got what, who's to blame for the current financial crisis etc.

[**JO**: up to now you've been arguing about the value that it will create, but at some point you'll need to point at the argue that it *has* been creating...]

JC: ...so you need to decide what people are looking for in their return and you need to be able to measure it, and I think part of that is traffic; I think that's probably still the number 1 driver for most people: to be on the web in some way – presence, traffic, brand, promotion, it's all those kind of things.

[**JO**: but in the vision you've been selling there are all these different dimensions, with the value of the networks and the technical parts. Are these still things you'll be selling to stakeholders?]

JC: That's quite difficult to sell to the outsiders. I think people have to be on the inside to even realise that there is some potential there, and that you're talking to peers, you can use this example in the context of another example and those kind of things. It's probably where we've failed in the UK to date. So far I've convinced them that they need to deliver their content – well I have three of them! Maybe four – but what I haven't convinced them to do is join the workgroups and participate, and I think if I don't, whilst I'm going softly-softly because they're frightened about the amount of workload, I think in the end I'll lose them because you have to be in to be bought into the whole process and why it's worth it and galvanised by it and all those kind of things.

[...] The Natural History Museum is in, and their new project which is BHL [Biodiversity Heritage Library] will bring in all the library content from the NHM.

[**JO**: content but also a partner in the way that some aren't?]

JC: all of them are supposed to be partners, but it's the level that they participate in the whole process. So the ones that do are the NHM, but the library part of it; the Science Museum; British Library; the National Maritime Museum, they contribute but they're not contributing any [content] themselves [...] And we probably need to do some work on the regionals, but I'm hoping that will happen through Gordon [McKenna of Collections Trust] and ATHENA [...] It's been a hard sales pitch into the UK and I think it's a cultural thing as much as [anything].

[...] Also the UK's a very peculiar place because it has got these great institutions, which is not quite the case in other countries; so you do have the Louvre, but you don't have the British Library as well, and the Natural History Museum and the Tate in quite the same world-renown as you do in the UK, which I think has made them difficult. It's as if they're saying what's your return, why are they bothering, they've already got a presence, people are going to come to them anyway, of course they know what the British Library is, it's all of those kind of things. If you're not in Europe in the first place like the Netherlands and the Rijksmuseum that's gonna play because it's in the Netherlands and part of Europe then I think you've got problems.

[**JO**: raising funds from the commercial sector is in the business plan. Do you see resistance from that sector to what Europeana is trying to do, does it see it as unfair competition?]

JC: I don't think we're treading on toes at all. At the moment I think we're alright but you could foresee that future. It's a bit like Google in a way – though I don't think we're going to get to that size at all – they were everybody's friend and Microsoft was the big bad, but now they've become big enough that everybody

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decides they're not their friend, and it's the same kind of suspicion of monopolies. We're going to submit a project for reuse to try and experiment in some of those areas that we've outlined in the plan [...] That allows us to pilot, also with private companies [...] The problem with the web is it's created this concept of everything for free, so they also expect the content to be free, and then what are you selling? We can't really sell the content anyway because it doesn't belong to us, so then what are we selling? And it's trying to push at the envelope [...] can it be affiliate income, can it be the structures? [...] Potentially, because of the way we're solving it, which is not to do the whole chain i.e. digitisation to the quality you want in order to make it in your search engine – because we're trying to solve the structural issues of how you access this data, then in theory you can go very quickly once you've sussed a few of them, then it should all be repetition: you know how to do the cross-walk for this and how to make this particular set of information work and you've got another example over here and therefore you go through your normaliser and [...]

[**JO**: how do you see your role now? Do you have to go to a higher power to have a lot of the decisions signed off?]

JC: I probably make most of them but pretend that they're made by somebody else [laughs]. We're owned by the EDL Foundation, so that's who I report to, and there is a chair of that which is Elizabeth Niggemann who is also chair of CENL, and that's quite useful because I've got a long-term relationship with Elizabeth through the European Library and all the rest of it, and I suppose we're operating in a similar way. TEL is, in political and human terms, three years ahead of Europeana, so it's gone through "yes this is great, this makes your libraries

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famous, and you're good because you're pushing it forward" and all the rest of it, to a suspicion about what my motives are. So there's a bit of a split at the moment within TEL between people who don't quite trust you anymore. I think that's again due to, you've got to a certain size, you're seen to be getting above your station and I'm having to back-track a bit there, which I can see could happen also within Europeana. At the moment it's all great because it wouldn't exist if you weren't there with other people, driving it forward, and they see that as a benefit. But as soon they feel it's going out of their control then you lose their buy-in, and that's quite an interesting lesson to have learnt from TEL, that having always taken all the decisions I'm now having to be much more careful as far as TEL is concerned; and I think I'm going to have to be the same as far as Europeana is concerned, and I'm much more careful already about at least looking as though they're not my decisions, or the decisions of the office. The other big advantage is that Europeana v1.0 has allowed me to employ Karin [Heijink] and Bram [van der Werf] as well as Catherine [Lupovici], so I've now got decent senior management and a financial controller, so all the jobs that Catherine and I were managing between us, and we were the only "grey-hairs" there, for [EDLnet], are now being spread across five people as opposed to two. And that's a big advantage, actually, because it means that it's not just you thinking "maybe that will do".

Mostly we're left alone to make all the operational decisions. That's also interesting, that there's been some moaning in the Network – understandably, it's again to do with control and ownership [...]. About March of last year [2008] we realised there was no way that this surrogate object model was going to make

it into production in a way that you could present it to the wider world and not be a laughing stock, because it takes five minutes to compute! Now our failing there was not to communicate that well back to the Network, but that was time pressures [...] But it meant that there's been a bit of an issue between what we delivered and what the aspirations were ... and yes, we fall a long way short of the aspiration [...] but it's the difference between theory and practice. We didn't manage that very well and we need to backtrack a bit and manage that going forwards [...] I suppose that's part of the problem of being the kind of person I am personally, which is, make the decision, get on with it, live by the problems, rather than keep trying to find consensus [...] I'm an end-goal person not a "how do you make everybody [happy]". So in a way, this is the result and we've got to then do a bit of bringing people back on board and making them feel that it does belong to them and it is their ideas that count, but that in order to provide pragmatic solutions to the problems there are things you have to do. And that's a bit of a dichotomy. In a normal business you wouldn't have to do that, you live by the proof of what you've delivered, not by what you let go, whereas now you're living by what you let go.

[**JO**: and the relationship with the EC, that would be like the board or the shareholders of a commercial company?]

JC: They're the shareholders, aren't they? It's a very strange relationship actually, because you're dictated to by them, and it's got worse since November, obviously [the public launch and subsequent crash of the Europeana site]. So they wish to be involved at a level which is just ludicrous, which they don't understand, and their interference causes huge problems. You manage a project by managing *the*

project, and you can have several projects but you let them all take their own trajectories and you try and make decisions along the way that, if you know you make a decision that has an impact on another one you have to deal with it, you can't just stop this project. The whole business since November has been about, can you get this online and this online, you must do this and you've got to sort this out, and you go "well I'm sorry, I can't, I've got ten other projects I'm supposed to be managing, I need to draw a line under this one and move on to the next one, which means that lots of the things that you want fixed I can't fix because I don't have the bodies to fix them, and anyway how important are they?"

For me that was the worst consequence of November 19th [...] Actually the hardware we had in place would be fine now, with the traffic that we're getting [...]

 [**JO**: funding situation at the moment?]

JC: We've got funding through until the middle of 2011, which is project-based funding. The aim is to come up with a solution to funding from 2011 onwards, and part of this consultation exercise is to try and get public backing in order for the funding to go ahead from the Commission. They as you know thought that the Commission would give 50% and then 40-50% would come from the Member States. The problem with the second half of that is that the Member States... we thought about producing a key and saying, this is how much you have to pay – and it's not huge amounts of money, it's 200,000 for Germany, it's 5,000 for Malta – but you only need one Member State to vote against it and it won't pass. [...] So then they said, well we'll do it voluntarily. The other option is some

kind of financial agreement where they fund us 100% but we have to submit a budget year-on-year and that's risky because politics change, you could all lose jobs overnight. You could obviously go on applying for projects, but you won't win them all, and then if you lose core you're losing the flagship... So it's a bit up in the air, actually. To say the least! [...]

We do have €760,000 raised from the ministries for matching and overhead funding for the projects we've currently got and two or three more this year [...] And that's through a wish to participate and be part of it and have a say in where it's going. It's coming from ministries of culture and education. The UK is notable by its absence! [...]

[**JO**: Discussed the context for the interview, and the particular interest in evidence for decision-making]

DH: Due to the lack of a paper trail, a lot of this will be answered from memory, and that can fail me! [...] Another caveat is that I started here on 1st of January 2010 which is fairly late in the Europeana lifetime. I think that's in the middle of Europeana 1, I was never part of EDLnet, so some of these way-back things I simply do not know.

[**JO**: where did you come from?]

DH: Originally I'm an archaeologist, I did a lot of digital documentation in archaeology, a lot of GIS, that turned into working with digital sites and monument record systems at the Swedish National Heritage Board, and in a while I branched out to all the digital aspects at that place, which were very broad. The National Heritage Board has an archive, it has a library, it has some activities that are museum-like, it has special collections that are museum-like as well, so it was a little bit of a cross-domain government agency to begin with. So I've sort of done Europeana on the national level. [...] Actually my first encounter with Europeana was when it launched and it failed and then I remember blogging critically about it, also about some other things like for example that it was so portal-centric and there was no API.

[**JO**: changes in the attitudes of cultural heritage professionals to Europeana?]

DH: What I think has changed over the two years is that I think that Europeana has become much more of an institution, it was a project when I started and now it's on its way to becoming and institution; and since we're so very strongly supported by the [European] Commission I think that some museums, libraries and archives feel that they're sort of forced to work with us rather than want to work with us. So we're becoming big in that way, in our little sector, and that means both that people like us and dislike us. Some people like us because that's how you get into the money flow from Brussels. And from what I can feel as well, and that's something that really figures in the DEA, is that there is a group of GLAMs who think that we are radical, when it comes to licensing, and there's a smaller group of GLAMs who opened up a couple of years ago who think that we are moving forward at a snail's pace, and it's difficult to please both of them!

I think one of the things that we are doing now is that we are trying to connect back to our CCPA much more, to see them as sort of stockholders of the company. They're not actually the people we sell our product to in the end, though that is the users, but [the GLAMs] are our shareholders. We need to connect back to them better than what we've done lately because we've drifted apart a little bit.

[**JO**: do you see any particular stakeholder group as the most important?]

DH: Well not really. Looking at it from my perspective, which is partially about developing, a lot on the portal and the exhibitions and above all on the API, I am formally responsible also for the development of the ingestion toolsets, but that is in practice delegated to someone else. [And] the same constituents who want us to be more close than we want to be, we need to be able to explain to them

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that Europeana is only the destination portal, that we are not a hub for distribution of content to be consumed elsewhere, then we will always have that number 25,000 in the Alexa ranking. We need to explain to them that to be relevant you need to be seen, you need to be available, you need to be reused, and right now there's a lot of resistance to the DEA, especially from the museum sector, actually. The libraries are the most open to it, I think because a bibliographic record isn't as unique as a museum artefact record. There are loads of museums have no problem with the DEA, but they are the ones with the highest proportion of naysayers or negative attitudes, and the archives are a little bit between. And getting the DEA implemented in practice is absolutely crucial, more than the destination portal.

[**JO:** there's a timetable...]

DH: I actually like that because... we actually tried, the first time, when we made a data agreement with the data providers we initially did want to open it up for... a lot of people focus on the commercial reuse but of equal importance is the right to reuse. And we had to back down, so we started very consciously to work in different ways to try to show the benefits of being open, and again trying now with the DEA to go that route, because it was quite early that we realised that the openness was necessary.

[**JO:** the work that's gone into the API etc has happened before the DEA was signed off, something of a risk?]

DH: Yes, and we did get a critique for opening up the API but in such a limited way. There actually was a strategy about it, I think I remember XXX criticising us

and I sent him an answer and basically the thing is that yes, in a way we interpreted our own terms of use as fundamentalist as you could, and made as tight a terms of use as you could, a little bit in order to make a point: that being technically open for reuse doesn't really matter very much if you're licence-wise and organisationally closed. [...] We wanted to show what could be done, rather than just speak about the theoretical advantages of having an API we wanted to show them in terms of applications. I think that was the reason why we opened up the API anyway, but it's also the reason why the API is so simplistic. There is no point in building a fully-fledged to 100% functional custom REST API at the point where we didn't know whether we could open it up.

[**JO**: and now DEA is definitely coming in mid-2012, is there a plan for further development?]

DH: There is. The target is that first of July, when we go CC0 (I hope we stick to that date – we have kind of gone out on a limb on this one so I don't think we're going to back down). Part of it will be that the API needs to be much better documented, there also needs to be a much smoother sign-up process because, since we're being open, we still want an API key in order to track traffic and perhaps also even throttle traffic for certain customers; the sign-up process needs to be automatic while still ensuring that people follow our terms of use, so basically as far as I'm concerned we're gonna pretty much copy the sign-up process that the Powerhouse Museum has: completely automatic, no human intervention, but you do, you know, swear on the Bible as you sign up that you are empowered by your organisation to bind yourself to these terms of use and to follow them. And if you do that you get the API key directly after you press

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send. The target is also that any search that can be done in the portal must also have its equivalent API call, and ultimately for the year I also do want to open up parts of My Europeana API. 100% search capabilities, that is the main KPI concerning the API this year, when it comes to functionality.

[**JO**: how do things get decided when, for instance, designing the API? How would you get the requirements of, for instance, a commercial body planning to use it?]

DH: The aim is that we wouldn't need to talk to them. That's part of why we went with a very radical metadata licence form is that we want a commercial partner as well to just sign up, promise to follow the terms of use. Any human interaction shouldn't actually be needed because it just doesn't scale for us. And we might make special projects, perhaps special public-private partnerships [...] but in general they should just be able to sign up and use it, and also monitor their API usage. If someone breaks our terms of use for the API we will probably find out by someone else telling us rather than ourselves.

[**JO**: how did something like the GLAMwiki toolset come about?]

DH: Actually it was the Wikimedia Foundation that contacted us through their GLAM Fellow Liam Wyatt. Of course Liam knew us beforehand, he had been here for a couple of weeks to work with us about what were the potentials involved in working more with the Wikipedia community and Wikimedia. Actually I think inviting him was a suggestion I made since he blogged during his residency at the British Museum. I read about that, and usually when I have an idea like that I mail Harry and/or Jill, and they liked the whole Wikipedian-in-residence idea and working with Wikipedia to reach much further than we can do on our own.

So Liam was invited here for a couple of weeks, he also became the keynote speaker for OpenCulture. The whole OpenCulture, that plenary, was a huge preparation for the DEA in many ways, and for a strategic plan where we are a distributor, a hub, not just a destination portal though we'll keep the destination portal, but it won't be perhaps as central in our planning as it had been up until then

So Liam contacted us by saying basically that it's too difficult for GLAMs to share their content on Wikimedia Commons. In order to do a batch upload you need to have a contact on the Wikipedia side and that contact needs to be able to script in Mediawiki and every batch upload is a custom project, and it just takes too much time and effort and needs to be made simpler. And it also needs to be done with good metadata mappings between the original GLAM source metadata to the Wikimedia Commons templates. He also said, we have some money for this, we'd like to partner up and build it with you, are you interested? [...] He called Jill about that and Jill said yes immediately. Then it has been quite a lot of back and forth with how to shape the project and scope it and finance it. And now we're at this memorandum of understanding level. We have a project initiation document on which we based the MoU. We don't even have e detailed project plan, actually, it's just an outline right now. We run very agile: we know the general area we want to go, we haven't decided exactly how. It's also because that's the way Wiki[media] runs their projects: there needs to be a lot of community involvement, we need to find a way to structure this project where it's not just a core team doing the development. It's a true open-source project, unlike

Europeana, which is only open source in the meaning that our code is open, but we don't run...

So I think pretty much how the product development works is that based on the strategy we make a yearly business plan. A strategy can outline things like, "we need to partner more with Wikipedia in order to distribute and engage with cultural heritage", and the business plan can be made more concrete, as in, what it is now: we start up this project. And that's the level where there needs to be a lot of detailed back and forth between me and upper management. And upper management in Europeana is Jill, Jan, Harry and Louise. Louise is the acting director of the European Library, which most people forget – they are sort of subsumed in Europeana – but they are their own branch. They are the ones I make suggestions to like "we want to develop the API next year so that it has all the functions that are also displayed in the portal". I usually don't go into very much technical detail, so I haven't talked about with them whether we need to deprecate our OpenSearch API and custom-build a REST API of our own; that's not the level of detail they are interested in. Jan will be at certain points, but not at the decision-making point.

[**JO**: Developing the business plan itself is done purely within the Europeana office?]

DH: Yes, but based also on input from the Network, and one of the things that will happen by next week is that Harry will go through the draft business plan to get all the delegates' input on it. But we are very much guided by our strategy, and also by what the Commission wants, and this is funny as well because the

Commission right now when it comes to open data is much more radical than many of our partner institutions.

Based on the business plan I will make a product development plan, which is pretty much a release plan. It contains user epics, if we speak Agile, and a rough outline of which order we will do them, and they go into the product backlog, and then the actual details are hashed out as part of the sprints. So it's not until the preparations for the next sprint where some user epics actually get broken down into user stories and tickets. But the product development plan I need to submit for approval by Harry, Jan and Jill. I'm responsible for producing it but I don't do that completely alone, so when it comes to data in I need to talk a lot with our ingestion manager and our business projects manager, and when it comes to everything that's to do with data out and engaging with the data, Annemarie, our mar-comms manager is my main stakeholder. So she will say things like "it needs to be possible in your exhibitions platform for a user to submit an Art Nouveau photo of their own. Make it happen!" And she's not then also very interested whether I make this happen in PHP or Java, but she is very much involved for example in user testing and usability but not on the tech level perhaps. So I'm the product owner and they are my main stakeholders. I don't interpret the strategy and the business plan all on my own. As product owner I get these inputs from my internal stakeholders; as the product developer it's my job also to come up with ideas for new solutions, but they need to be OKed by my stakeholders.

[**JO**: how is the business plan itself approved?]

DH: It goes to the [executive] board for approval. Formally it does not need to be approved by the Council of Content Providers, I *think*, but we certainly feel that we need their informal support for it [...]

[**JO**: what does success look like?]

DH: In the business plan there are these typical KPIs set up. The API and the portal are all part of what we call the distribution [strategic] track. For those there are very concrete, measurable KPIs. I do feel bad when I don't meet them, but the KPIs are numbers; there are other factors as well that aren't as measurable, perhaps. So for example this year the API will fail its KPIs. I think our target was 25 implementations but we have I think 19. And the target was a larger share of referral traffic to Europeana from the API clients than we will actually be able to reach. But that's the thing as well with comparing something that you defined one year ago, because a very big thing that happened concerning DEA, API, Europeana as a distributor this year was this thing that the European Commission contacted us, said that as part of the Digital Agenda, and building up for a new PSI directive about open content, we want you to have four simultaneous hackathons across Europe. We never planned that, they contacted us about that about eight weeks before it actually happened, and we had to scramble to do that, and it resulted in, we have 19 API implementations but we have I think 60 prototypes, and the number of prototypes were never actually a KPI. And we had such a good response to the whole Digital Agenda, the Hack4Europe hackathons, and the strength that gave us in European Commission support resulting from it. That was never a measureable KPI but it

was made possible through the API. I will not meet my numbers but I don't feel I've failed. I don't think my management feels it either.

[**JO**: engagement is another tricky thing to measure, and image in the eyes of content providers]

DH: I think it has [contributed to that]. I think it has also scared some content providers. There are some providers who explicitly block the Google crawler because they don't want to be searchable in Google! So the very notion of an iPhone app in the Apple store where someone can search and find their content is scary. So I think in total this was a huge success [...] but there are certain of our partners who think that we are moving ahead too quickly.

[**JO**: do you think those ones will refuse to sign the DEA?]

DH: some of them will. I would be very surprised if that wouldn't happen. I think some of them, and this is what we have encouraged them, is rather than leave Europeana completely, if there are certain parts of your metadata, for example descriptions of items that are more interpretive than factual in nature, we can reharvest and remove them. [...] If you have an artefact in your museum and your curator has written a full, almost academic paper about this, then actually that is not metadata, it's a digital object in and of itself. We'd love to have it and link it to the artefact which it's about, but it does not necessarily need to be in the DC:description field of the artefact itself. But I do think there are some that will pull out altogether, we've gone into this knowing that we will lose some, or at least there is a mental preparedness for it. Jill fights to the last to get everyone on board [...]

[**JO**: should the Commission or member states do anything to keep people on board, to encourage or twist their arm?]

DH: Well the Commission is already doing it, I would say. I would be very surprised if the exemption for the cultural sector from the PSI directive will remain for much longer, for example [...] that's certainly the direction they're going. So when it comes to the metadata I do think that will happen. That does give us ammunition. [But] Member States don't slavishly follow what the Commission says or what the Parliament decides [...] One of the arm-twisting things is that we and all those other European projects are financed by the Commission, and to be part of any project in the future where you're supposed to contribute content to Europeana it will actually be impossible to be a member of such a project without accepting the DEA. It will lose the opportunity to get funded through the Europeana project flow[?] if you don't sign up. That's the stick. [JO: or the carrot] It's a little bit of both, I suppose!

[**JO**: and on the orphan works policy changes?]

DH: I'm not very knowledgeable about that part but [...] I think that the end-point of a due diligence process would be to publish the orphan work because if you can't find it yourself someone else needs to help you, and they can't help you unless it's on the web. That would be my position, I seriously hope it's a conclusion the European Union [reaches] as well. But risk [aversion] is always safe, you know, so we'll see.

Here the Commission does both: on the one hand, the EC and Parliament is just like the US Congress: the cut-off points where things enter the public domain just

keep getting longer and longer, but I do hope that at least for what is already in the public domain that, once we win the metadata battle, that we will get the same political support for the battle over what I would call the endemic copy-fraud within our sector. I think it's bad to make available a copyrighted work without remunerating the copyright owner, but I think it's equally bad to claim copyright over something that no one does have copyright over [...] they are two sides of the same coin. So we started that a little bit with the Public Domain Charter but of course we're not the police, we're never going to overrule the licence that one of our partners put on their digital object, but once the DEA is safely implemented I do think we are going to [...] have workshops about, why and what is the point of putting a copyright clause on a digitised book that was written in the 18th century, and so on.

[**JO**: the Comite des Sages talked about equitability in public-private partnerships. What form might that take?]

DH: [...] I'm not sure it's something you can legislate, because the public-private partnerships are contracts between two partners. [...] This idea about limiting the exclusive nature of the material for an amount of time and then it would again return to the public domain I think has support here. It's also something that we cannot control, in a way. We are metadata aggregators, we actually rely on the digitisation of others, and if the Austrian National Library wants to make a deal with Google Books we neither can nor want to stop them. We'd like to advise them to make sure that those public domain books aren't taken out of the public domain forever but only for a limited time. But it is really a contract in between them. And I know not all Google Book and library contracts are actually

open to the public to read. I think the British Library did publish theirs [...] after someone made a Freedom of Information Request. And I think the [time limitation on the] exclusivity clause is longer than what the CdS has recommended, but there is one at least.

[...] There are some activists who feel that whether something is public domain or not cannot be changed by a contract between two entities, and they claim that the PDF that Google produces is in the public domain no matter what Google says, what their contract says. The free-text index, that one is created by their advanced OCR algorithms, that one may actually be an independent work on its own, and fall under copyright, but not the faithful image reproduction of the text. That might be a sort of balance you can strike: that the PDF that of Charles Dickens that the British Library supplies will be public domain mark, but the advanced index of it that makes it searchable, is not.

[**JO**: thoughts on the evolving context for end-users?]

DH: Most of that [environmental] scanning is informal. It is part of my job description and Annemarie's job description to try to keep tabs on developments within social media [...] I'm the kind of person that just wants to jump on every new thing, she is much more careful and measured when it comes to these things. So we don't have a Google Plus page just yet, and things like this. But it's an activity that's difficult to formalise because it also has to do with a culture change within society as a whole. But we do read the typical studies like the Nielsen social media studies, I do read studies now and then about how people use their tablets – apparently in bed and at the table and so on – to try to catch what that would mean and how we need to develop our services. Our

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preparedness us much, much better now than what it was. At least when I first arrived here I had the feeling that there were a lot of people at the office that didn't really know the web [...] and web culture in general. I think that's very true, especially for the more conservative GLAMs. It's the same GLAMs who usually don't want to open up their content who also have a hard time of how to relate to online culture. It usually goes hand-in-hand. If you're the kind of GLAM who wants to block Google from crawling you, you probably are not extremely active on Facebook in conversation with your users! [...]

[**JO**: how does My Europeana fit into a vision where the portal is of less importance and the role of a channel for data/content of greater importance?]

DH: [...] First of all, My Europeana is very under-developed, I haven't focused on it. In line with the idea that we will become more of a distributor and more of a platform for others to build and customise what they want to do, this year what My Europeana will be developed for is (1) to be an area with a good level of granularity to decide which objects to put into your own user-created galleries or image grids, for example. It will also be an area where you configure a search widget to paste into your own website to let your users search Europeana. [...] You can tag in My Europeana but your tags aren't indexed and made available for others to see. Hopefully that will change this year as well, but the widgets like user-created galleries, image grids, they come before in priority than the tagging [...] [Tagging] is also dumb tagging. We have this idea about semantic tagging where we'll pattern match the user tags in with an ontology, and if there's a match the user can always disambiguate, because they might tag something "Tokyo" but it's not Tokyo the Japanese pop-band, it's Tokyo the capital of Japan.

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So the user will help disambiguate and once they've done that we pull in and index ... so if someone searches for [Edo, the old name for Tokyo], you still get a hit. A little bit more of an ambitious tagging but it's more in line with this idea of Europeana being a semantic resource.

[**JO**: the if there was a My Europeana API would it be a read-write one?]

DH: that would be the target. I'm not certain we will finish that this year, but there's this project called Europeana Awareness [in which] there is a whole work package directed towards improving the API but also making widgets [to be] built on top of the API, that's the plan. That means that [...] favourites in My Europeana should be callable [...] given proper authorisation [...] And that's one of the complexities that's added with a write API, you need authorisation built into the API itself [...] I think we will try to lay down some of the infrastructural support for things like that this year. It will be in the nature of adding annotations on existing objects rather than writing full objects into Europeana. We do have a prototype where you could create full objects externally from Europeana and submit them for harvest and publication by Europeana. It's really just a back end, it's made within the ASSETS project. It would still need to go through the Europeana review process before being published. I think we are brave enough to let annotations and tags be published before review, but I'm not sure we're there yet with full objects [...] I think [the submitter] needs to be authorised in order to submit a collection. So it's about both authorising the submitter in the first place and then okaying the submitted objects as well. It feeds into the same data-in channel we use to harvest institutional content.

We probably wouldn't deploy it directly in the portal, because the portal doesn't have a clear theme, and UGC often thrives on clear themes. It can often be extremely nerdy like Galaxy Zoo, or even nerdier like Old Weather. When we're discussing something like this it probably fits much better in, for example, the World War 1 project, or within the already-themed virtual exhibitions, rather than as a function in the portal to submit whatever you want. I think it's much easier to get a response if it's, submit your most beautiful Art Nouveau buildings or your grandad's memories from WW1 than if it's just completely open-ended.

Part of the thing where we have been so slow with social media has been the multilingual aspect. It's the same thing with any institution which starts thinking about UGC, its "do we moderate what happens if someone uploads Mein Kampf and says it's the best thing in the world" and all those fears. And then they are multiplied by the fact that someone can write a comment in Romanian, and we don't have someone in the office that can help us review it and decide whether it's a naughty thing or not. That has always slowed us down in our decision-making as well.

[**JO**: when you think about something out-of-the-box like this, how do you decide whether to do it or not?]

DH: this one would never go to the content providers [...] There was the user group in Europeana v1.0, one of the aspects of which was working with best practices for user submitted content. If you look at the WW1 memorabilia website, the terms of use, the licences applied to the metadata and the content are pretty much in line with what that user group recommended. So we consider that, and the fact that the Commission liked that as well, to be our go-ahead to do

it. We would be even slower if we had to have an explicit OK from the whole CCPA every time.

With the WW1 project it is a partnership project between ourselves and the Great War Archive in Oxford and the German National Library. So the German National Library is very much the one that organised the local collection days in Germany and so on, so the way usually of trying to show value is by involving a small number of partners in projects like this to try to show concretely that you can do crowd-sourcing like this, and our hope is that by doing that, other institutions who have been thinking about crowd-sourcing might get that last piece of will or guts to actually do it [...] There is a tendency that there are some institutions who are more on the ball, and they tend to become our pilots over and over again, but it's also human nature a little bit: you learn after a while which partners you can contact and actually do something with, and which ones you can contact and all you end up with is talking.

[**JO**: how about closing the loop and returning UGC and enrichments to the content providers? This has started hasn't it, with enrichments in the API?]

DH: yes, it's in the API, but if you want to do stuff in batch the API is not really the best product for it. We started doing it with a Linked Open Data pilot as well, the enrichments are part of those LOD dumps as well. We actually intended to have a pilot project this year where we created three of these pilot institutions, and sat down to work together with them to help them reintegrate these enrichments back in through their repositories. But I think we've exchanged 50% of the Europeana staff this year, almost. The entire development team, the entire ingestion team. So that project has been postponed to next year. We did

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manage to do the LOD pilot[...] but the idea was to make Europeana one big OAI [gateway] where people could harvest back entire collections including their enrichments, and to use that as the main mechanism of feeding back any added date to their collections after it had arrived at Europeana.

So with the API and LOD there are some institutions that could do this on their own but we are not aware of any who have done it.

[**JO**: is there any push from providers to do it?]

DH: not very much. And that's why we wanted this to have a pilot project; again, to showcase the possibility, because if you don't it remains a theoretical idea but it's difficult to take real action.

[**JO**: right now there's not so much to offer them]

DH: no. And we need to work more on how we generate our semantic enrichments, they're a little bit blunt

[**JO**: is there anything on the horizon that's a threat to Eurpoeana?]

DH: short term the DEA is our biggest gamble in terms of network buy-in. Long term what could happen is that, right now we have extremely strong support from the Commission but we are still a project rather than for example a European agency with guaranteed funding, and if we do not deliver what the Commission wants, if we don't succeed with showing the good things that can happen if you open up for reuse, for example, right now we are funded so completely by the Commission that if we lose support by the Commission that would pretty much kill us. That's our financial sustainability issue. They are 80%

[funders], but the other 20% come from various national ministries. So we're 100% publicly funded. [... In] our own network there have been surveys, also surveys of European ministries of culture; our main stakeholders on that side, they *do* want us to be a public service that is largely publicly funded. They don't want us to be sellers of metadata or of content and have that be the main income stream for us. I think there were more ideas like that at the beginning of Europeana, like charging per click through to the original provider and things like this.

I think no one in our network would complain if a commercial partner wanted to use our API and use it so intensively in numbers of API queries... I don't think they would be against a freemium model where up to X number of API calls per day it's free for everyone, but for commercial entities above a certain cut-off limit there's some sort of fee you have to pay. The nightmare would actually be to have an income sharing mechanism with our 1500 providers! [...]

[**JO**: Interview preamble, noting that Europeana as an interesting study in decision-making because that is so complex]

JM: it is incredibly complex, yes. It's all the more complex because the political component, of course. Our reason for being is not that the sector got together and said, this would be a great thing. No, it's a few political figures got together and said, we have to do something against the increasing American influence on our digital cultural heritage. That was the original thinking behind it, and we are still trying to cope with that. It's great that they did get together and that they did have that thought and put some money behind it and some effort, but it also of course makes our lives a bit difficult because politicians don't always understand the sector as well as you might hope. And that aspect makes our life a bit difficult from time to time. Personally I don't suffer too much from it, I'm sort of shielded from that complexity by Jill and Harry mostly, they deal with most of it, but from time to time it creeps through, for example in the emphasis they put on the portals as the main access point for the public to interact with the material. Build a destination portal, that was a great idea in 2006, perhaps – perhaps not even then – but we have come a long way since, and they haven't so far. So that's a bit tricky.

 [**JO**: do they still seem like the owners? Is that how they're seen?]

JM: I think we're trying to move away from that a bit, and that's been a learning curve for the past two years I would say. I think the effort we put in, in defining our strategic plan and making that very much a joint effort between all the

stakeholders including the sector but also market parties, also the politicians themselves, also potential user groups etc.; that has allowed us to some extent to set our own agenda. So that's been a very good investment I think.

[**JO**: is that starting to pay off in how other stakeholders feel involved, feel they have some control over it?]

JM: I think so. The CCPA plays a big role in that, but even there, there are always some dissenters, for example there are people who think quite vocally that this should be a democracy, so everyone who contributes gets a vote [...] so it's a community of heritage institutions that make all the decisions. I don't necessarily see how that would work but it's a potential way of solving this issue. But having to go for each decision back to the whole group of stakeholders, that would be very difficult. So we try to do it the other way around, we try to say "OK, this is our vision, this is where we're trying to go, these are the things we planned to do in our yearly business plan, the things we're planning to do to achieve those, what do you think of that? Give us your feedback." And then sometimes it's a bit disappointing what you get back but at least you've given people the chance to give their input [...]

And because we're a fairly successful initiative and it's seen to be and applauded for that by the policy-makers, it also means that everything that is potentially wrong in the sector they turn to us and say, "you should fix that". Obviously we can't, we have this one job to do, and precious little resource to do it with, so there is a strong sense that [...] we need to get the whole community involved in doing stuff – not just providing content but also discussing amongst themselves on policy issues, rights issues, sustainable funding for digitisation efforts rather

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than for metadata initiatives such as Europeana. So what we're trying to do is engage the whole network rather than use the network. We had some initial discussions here and people kept using that phrase "how can we use the network to do X, Y, Z", and we very consciously said, no, we shouldn't be using that phrase any more, it's not about using them, it's about involving them, it's about working with them to achieve a particular goal.

[**JO**: and not seeking to speak for them but to facilitate...]

JM: ...and that doesn't mean that we will be silent. We can be quite outspoken about some issues: the rights issues, in particular. And that's where there's this new initiative, *Information Sans Frontières*, like "doctors without borders" but for information [...] It's where a number of organisations including Europeana come together – I think the CENL is one of them as well – and they try to set up a body that can do some actual political lobbying in Brussels. You have to have people on the ground there on an almost day-to-day basis to be involved in the discussions that go on there, especially when it comes to the IPR issues, things like that [...] That's deliberately *not* a Europeana activity but a joined up activity from a number of players in the sector.

[**JO**: were you in Europeana from the start?]

JM: No, I only started March 2010.

[**JO**: Do you know what the prehistory of the technical side of it was?]

JM: I know that when this initial group was given the go-ahead to build a prototype they were given 15 months from nothing to build the prototype, and they worked insanely hard to get there with very little resources, very little

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money as well. Then the European Commission made [what's easy to say in hindsight was the mistake of] making a big song and dance about the launching of the Europeana prototype, and at that time the system was hosted on a few very small servers. PC-type equipment. And that was insufficient, and when they got flooded by quite a substantial load of people interested on the very first day it broke down. It's a classic big European big-bang thing, and not putting up the money in the first place to get it... If you search for Europeana still today, one of the things that you find on page 1 or 2 is an account of that history. It's still in some languages on the wiki pages. It's really annoying!

After that, of course, all of a sudden there was budget to properly host the servers and to make this work at scale. That was around the time when Bram van der Werf, my predecessor, came in, and he professionalised that whole side of things. So it went to an outside service provider with proper money behind it, with a proper SLA etc., and it's still there. One of the things they then did was, rather than throw away the prototype and start again, was to build on the prototype. So we still have parts in our code that are from 2007. One of the things that's still in there, it's slightly evolved, is the ESE data model, that was there from the start. And that enabled us to get a lot of data, specially library data in very quickly, but then it's relatively poor data that you get it [...] so we've had to spend a lot of time developing a newer model, the EDM.

[**JO**: the choice of an open-source stack: where did that happen?]

JM: I think it was mostly inherited from TEL. Go with what you know, try to reuse what you can reuse, I think that was the main motivation for that. I don't think it's a bad choice, either. It's all quite robust software. [...] If you're looking at

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the web development world, of course, you have two choices: you either go PHP or you go Java, basically. And it you want to attract the professional, corporate-style developers to work on this, that go for robustness and stability etc., then usually in my experience the Java world has those kinds of people/ I'm not saying they don't exist in the PHP world, of course they do, but it's a slightly different crowd.

[**JO**: how about recruiting and retaining developers?]

JM: We've lost a few. From the people that were here when I came here we only have one left [3 have gone] It's been quite a turnover. There are various reasons for that. One is that in software projects you rarely see people working 15 years for the same company, there's a natural turnover. It's also a case where over the past year and a half we've tried to further professionalise not only the back-end, the hosting side of things [...]; we've also tried to professionalise the development process itself. [We have started to] introduce agile scrum as our main development methodology, and that's working really nicely, it's been so much more predictable, I think. You may remember the Rhine and Danube releases and planning: long lists of features that would be in either of those, and in the end we ended up disappointing a lot of people [...] One of the major improvements over the past year is we stopped doing that, we just say, OK, we have a goal, a direction where we want to go that is represented in a product development plan [currently officially in draft...] But roughly on a monthly basis we try to prioritise things from that and say OK, what are the elements that are urgent that that we can really make a dent in, in a sprint. So a question of

prioritisation, feasibility etc., rather than work upon 20 things at the same time; that didn't really work.

[**JO**: do you think that will satisfy more people that were expecting things from you?]

JM: I think so. It works both ways. Other than saying "we are working in that direction" we have stopped giving specific dates for specific features; it just doesn't work that way. But that's a tough sell, and I spend a lot of my time doing just that: explaining to people why we can't say, "in six months' time we will have this, this and this feature". I can say where it is on the priority list, and then you get a battle of where to put it on that list, but that's as it should be.

[**JO**: you can be more reactive]

JM: Yes that as well. You don't know what will be your most urgent need in six months' time, nobody can know that, let alone in two years as was the original planning scope. So we've learned not to do that anymore; to *not* promise. This disappoints another class of people, the people who want to know everything in advance; and I can also see that they benefit in knowing everything in advance. Yes, if you could, of course it would be great, but in the old way of working you *thought* you knew everything in advance and in practice you never really quite got there.

[**JO**: the decisions about what functionality will be made or what bugs will be fixed are made in the Europeana office or development team?]

JM: Not *in* the development team. [In agile/scrum methodology] you have different roles: you have the scrum master, X developers, and a dedicated tester,

which is the final role that I've [recently] been able to fill [...] and then you have a person liaising closely with the development team which is the product owner. The product owner is a representative of all the stakeholders around the product, so in our case that's David Haskiya, who took on that role and is doing an excellent job. His job is to gather all those requirements, to create user stories [...], a backlog listing hundreds of items that can be quite detailed. They can be feature requests, bugs, sometimes the development team puts stuff in there for 'paying off the technical debt' [...] So that leads to a very long list of user stories [...] Then [David] maintains a priority list of those, and of course not all requirements are completely prioritised because priority always depends upon the urgency of the issue but also the amount of work required to fix the issue, to create the functionality. So there's a bit of a planning cycle going on around that. What then effectively happens is that for each [four week] sprint we would have a planning session where we go through the top 15-25 user stories – a change on the portal or the ingestions system or some documentation that needs to be updated, etc., - and the developers plan and make an estimate of the work, and then you see which you can fit in that sprint. The objective is for each of these stories to get some deployable improvement to a product. So what you deliver has to be working code, documented and deployable. Whether we always deploy every incremental improvement to the portal is a different matter because you might want to, for PR purposes, bundle a few of them together, or if you're doing map search and display as we're doing now then you might want to wait until you can deploy it totally. But [even that] goes a bit against the grain of Scrum [...] You have to use your common sense.

[**JO**: So a lot of those decisions are in David's hands]

JM: Yes, it's really in his role as representative of the stakeholders. So it's his obligation to go back and discuss and resolve priority conflicts between the stakeholders. And sometimes he can do that on his own and sometimes, if you're talking about big chunks of work where everything's really important then sometimes he has to escalate that to the management team and then we make the decision there. We keep an eye on the business plan and strategic plan and think, if we really have to choose between two competing pieces of development, which of these brings the most benefit to our business goals. That happens very rarely but sometimes.

[...] The team seems a lot happier with [this methodology]. To me that's one very important aspect, and the net effect is that the productivity of the team has grown quite a bit, so we're able to turn around things much more quickly.

[**JO**: Was anyone less happy with the move to Scrum?]

JM: I think that had something to do with XXXX leaving. He had this guru role, he knew everything and the others had to come to him for changes to the backend. With Scrum it's much more about sharing information, openness and shared responsibilities, and [...] I think in retrospect that helped his decision to move on.

[**JO**: this is the nitty-gritty of what makes an organisation tick]

JM: Yes, it's matching processes with people, and up to a point you try to make the processes fit the people, but sometimes you can't. You're making process changes to further the organisation goals then if they don't fit with the individual

goals of people then sometimes either the organisation or the persons has to make the choice to move on.

[**JO**: from a sustainability point of view do you think the underlying platform and the architecture you've built on the top have positioned Europeana well?]

JM: I think that for quite a few years we can build services on top of the architecture that we have. But that's not to say that we don't keep an eye open for improvements. I'll give you one example [...] We currently store everything in a Solr index, so we use Solr not just for indexing purposes but as our main internal database on the production servers. Well Solr was designed as an indexing utility, not as a database, so there are some things that we would like to be able to do with the production database, things like data mining, statistical analysis, but also relating records – if you're doing things like hierarchical objects where all of a sudden you have to retrieve not just an object, but an object with all the related objects – things like that fit better in a different data model, it could be a relational database, it could be a noSQL database like MongoDB or whatever, but Solr probably isn't the best possible choice; and we're a bit like a carpenter who has a hammer and needs to paint a door and says, "well I'll dip the hammer in the paint and throw it at the door"! Some paint will stick, but... So using the right tools is important. So we might be doing a bit more of that. We'll probably stick to using Solr as the indexing engine because it's really good at that part but not at the other parts.

[...] There is [also] PostgreSQL, but that has only ever been used for the data that has to be updated in the production environment. Like user data for My Europeana etc.

[**JO**: In the long term is there the possibility of Europeana's architecture becoming more distributed?]

JM: ...I think you would struggle to create high-performance services on top of a truly distributed architecture, because of the scale we're working in. The more we move to the Linked Open Data space, the more distributed applications we will see. But I think for large-scale services dealing with millions of records it's still a long way off. And in a sense of course we've always been distributed architecture because the only thing that's centralised is the index of the metadata, and the objects themselves are all distributed. And these objects are not under the control of Europeana, that's a Good Thing...But how will that develop over time? I'm not sure, I think there will be more distribution as networks get faster etc, but I think it will be quite a while before we see the disappearance of central indexes such as Europeana.

[**JO**: Is there any sort of contradiction in the fact that Europeana is, on the one hand, an aggregator, and on the other, pushing for LOD and therefore in a sense more distribution?]

JM: Not necessarily. I think that for many people here in the Office and the Network, when we think about LOD it's about pushing the data that we have aggregated into the LOD cloud; so allowing relationships between our aggregator data with the rest of the world, with things like DBPedia etc. So to create those links, that's our immediate goal. At some point, if the tools develop to dynamically query this whole LOD universe, then of course the relevance of aggregation becomes less. But that's still quite a few years away.

[**JO**: Do you see anything on the horizon or in the environment that might change the way you do things, you do development? Perhaps the DPLA? How might that sort of collaboration change things?]

JM: I hope they will do some of the work! [laughs] I think for now we focus on interoperability at the data level. We're actually quite pushy about them not re-inventing the wheel where EDM is concerned. The cross-domain data model that we've developed, so much careful thought has gone into it. If we ever get to implement it, that is, which I still hope we do! I think that's one of the major achievements over the past few years, and now the challenge is to make a high-performance implementation of that data model, it's very rich, very powerful; that means that there are a lot of things that can go wrong when you implement it. But if we can get them to adopt EDM as their primary target model then anything we do will be of benefit to them, implicitly, and anything they do, in a development sense, will be of benefit to us [...] Of course there will be slight changes. It's much like one XML tool being able to access the data produced in another XML tool, it's at that level. And if we can get them to do that, that will be very strong. So yesterday we had a few people from CLIR here [... who are also involved in the DPLA initiative] so we again explained why EDM's a good idea. We're working together on part of the implementation with people from the National Technical University of Athens [...] and they are in Cambridge, Mass., today, explaining about a metadata mapping tool they have created, MINT, which is really brilliant. We're going to adopt that in Europeana full-scale [...] They are also slated as part of the [DPLA's] "beta sprint" where they select the building

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blocks of DPLA [...] That tool might become a very important linking pin between the two projects.

So it's not about everything we can do but it's also trying to influence people to not duplicate work where we can avoid it; not to stifle creativity – is someone has a brilliant idea, please let them work on it. But if you're solving the same problem and there's already a very good solution out there, why reinvent wheels? You reinvent wheels if you have a radically different shape of road to drive on!

[...] I think in some ways they have a bigger challenge than we have, because Europeana grew [...] from a political decision, so from Day 1 there was funding, there was backing. We've had a lot of benefit from the European commission saying, "if you want to do a digitisation project with Union money you will have to supply the results of that to Europeana", and of course without that we wouldn't be nearly as big as we are now, in terms of content [and] network. So without the US Federal Government doing something similar I think it will be very challenging for them to harness the power of the network. So [...] we're approaching the same problem but from different angles; the European one started off as a top-down, and we are trying to build a network to make it bottom-up as well; and they started from much more of a grass-roots point.

[**JO**: And funding is so different, with philanthropy such a big part of the mix there.]

JM: Yes, it's Mellon, it's Bill & Melinda Gates, Soros [...]

[**JO**: There has been more talk about digitisation from the Comité des Sages and Commissioner Kroes. Are you expecting to have to get involved in digitisation and digital archiving?]

JM: In digitisation, I think that's a long way away; in digital archiving, one of the specific recommendations of the Comité des Sages was that we should play a role in that [...] That's a big, big task – the scale of it [and] to do that on a European scale it would have to be truly distributed, you have to look into digital preservation of the material. So it's a really big job [...] We've said to them, "we love you're recommendations but this one we won't act on now". Potentially it's a good idea in that there are these institutions that may have money to digitise (and you see more and more low cost digitisation methods coming up [...]) but [...] hosting that online etc. [is] a big commitment for a small museum. So I can see the potential need for something like that, but for now it's something that we can't do alongside all the other things we have to do, so it's not a big priority for us at the moment.

[**JO**: hosting and archiving are not quite the same, of course]

JM: Yes. On a very small scale we're already doing something similar, which is user contributed content that we've accumulated through the World War 1 project, and there will be more of those. So that's our toe in the water in that respect. But there we are slightly confusing our role as aggregator with our role as data provider. But it does give us a chance to experiment and understand the real issues. Things like persistent identification, long-term storage – and by long-term I mean 200 years from now – things like that [...]

[**JO**: what role might the developer community have in supporting Europeana?]

JM: Well historically we've worked with two distinct developer communities. One is the developers of other cultural heritage institutions and scientific institutes etc in the European projects. Projects like Europeana Connect, ASSETS, Mimo – many projects have a development component, and some of these have yielded very good results that we've been able to incorporate. Mint is one of them, but also we're now integrating some work that's been done in ASSETS on improving the ranking factors for the various Solr fields based on an analysis of the log file results. So if you see in a log file, for example, a session where a user has searched for "Pablo Picasso" and then clicked on one where Pablo Picasso was in the field DC:Creator; and if the chance of [that] is higher that when it's just in DC:Description, then that's an indication that DC:Creator is a more important field for indexing that DC:Description. Which you know intuitively already, but if you put a large data-mining approach to that you can get some good results, as far as we've seen, with the ranking. They've applied the same principle to recommendations. You can see if you have somebody looking for Mozart, then giving Beethoven as a recommendation is a good idea because they are related in the user's mind and behaviour, which is much stronger than giving something that just looks like the search term that was entered. So those are examples of the types of things that were developed off-site and integrated into Europeana.

[...]The other [developer community] is the developers that we've attracted to the hackathons. That's about, we have this API, we have this linked open data, what can you do with it? Help us explore what the possibilities are, but also giving them the chance to work with some really cool data sets and creating

interesting implementations. And there we see a lot of brilliant ideas have come out of that, but then what? How do you push them forward.

A third group of developers that we thought about involving is the open source community. There are a few very good reasons why that hasn't worked so well yet for us. I think the main reason is that there just aren't that many large-scale digital library projects out there, so whatever we do you could reach a maximum of maybe thirty or so implementations of this Europeana open-source version. Perhaps the aggregators might want one, but it's not something that end-users – even if they're developers – feel attracted to. If you set up an open-source project for an alternative web server or for a text editor, something that developers feel related to somehow, then it's much easier [...]

We try to facilitate [sharing] wherever we can by things like ThoughtLab, where people can present their prototypes; by Europeana Labs, where people have a source code repository and can store documentation if they want, but at the moment at least we're not trying to build another GitHub or SourceForge. There are the tools there, so we're quite happy, if people build related but standalone components, to have their development on something like GitHub and then do a link.[...]

If somebody comes to us and says, "I have this brilliant idea for something to build on top of your software, would you be interested in taking it back, of course we would talk to them. But it's not something that currently we have the time and energy to actively pursue.

[**JO**: Likewise you can show of other people's creations through Labs, but you cannot support a sandbox...?]

JM: We could potentially do that, if someone comes along with a really interesting prototype that they've developed either on the API or on our source code, and they say, we'd really like to show this off but we don't have a place, yes of course we could find a space.

[**JO**: And the wider OS community beyond that, Solr, Apache etc?]

JM: We've done small things [with Solr] and with SugarCRM, which we use as our main CRM. We didn't do that development but we financed it and then allowed them to put it back to the SugarCRM community. We're aware of the potential there but we're still trying to fin the best way to tap into that. It would always have to be a combination of taking and giving. We at least offer the software [...]

[**JO**: Is there a European policy on using open source?]

JM: There is: thou shalt use open source as much as possible, and anything you build using European funds has to be released under EUPL or something equivalent. That's very similar to GPL. Unless there's a very good reason not to, [usually] that it incorporates some proprietary software from one of the partners – something they did outside of the project.

[JO: could you tell me a little about how you came to be involved with

Europeana?]

LM: I've been working with the Commission for fifteen years, almost, and I joined

DG Information Society in 2001. And at the end of 2005 I joined the unit where

I'm currently working, which is now called "Access to Information" and at the

time was called "Digital Libraries and Public Sector Information", working at the

Digital Libraries Initiative. This was my main task for some 5 years. I moved

more or less one year ago – I still have a light involvement with digital libraries

and Europeana but I'm more on the other main strand in our unit, which is public

sector information and open data. Cultural heritage online and open data overlap

and are interlinked, but we define the work of the unit along these two strands.

So my involvement [in Europeana] arrived through i2010, because at the time

we were under the Strategic Framework for the Information Society which was

called i2010. In Sept 2005, the Commission issued a Communication to the

Council and the Parliament with the title "i2010: Digital Libraries". And the

concept of Europeana was already there. Actually the idea has a certain history, it

was based on various projects co-financed by the EU in the area of ICT research

on digital libraries, and through the e-Content programme. . The 2005

Communications was a new start: in the coming two-three years, I was able to

follow the process of creation and launch of Europeana (this happened in 2008),

and of its consolidation during the successive period.

[JO: was it an idea that came from the Commission itself, or was it something that was brought to you and that you supported?]

Well, co-operation among libraries – mainly national libraries but not only – with a "point of attack" that was digital technologies, is something that we had been working on for about ten years before 2005; Patricia Manson [in 2012 the head of the eContent and Safer Internet Unit] and other colleagues had been working since the '90s on Telematics for Libraries, part of third R&D Framework Programme 1994-1998. It was in this context that we started the idea of collaborative projects that are co-funded by the EU and pull together key partners from a range of Member States, possibly all of them. So that is in a way the prehistory of the Digital Libraries initiative.

Then a letter was issued on 28th of April 2005 by six from heads of state and government. The initiative came from French – the only handwritten signature is that of the French President at the time, Jacques Chirac, although it was done in agreement with all the others [Germany, Italy, Spain, Hungary, Poland]. The letter was addressed to Mr Barroso, the President of the European Commission; the strong idea in the letter was "we want a European digital library". No doubt France had a very important role in initiating all this. In particular, at the time it was the president of the French National Library, Jean-Noël Jeanneney, who had inspired the letter of Chirac. In the Commission we were very supportive of the idea of a European digital library, and there was a certain convergence of vision with the initiative by France. Google had moved into digitisation of books and digital libraries, it had launched the project which is now known as Google Books, at the time it was called Google Prints. And Mr Jeanneney had expressed

concerns about leaving the whole digital libraries' activities to this company, especially about a possible global dominance of the English language and a loss of cultural and linguistic diversity. In short, his message was: "we cannot leave to a private enterprise the task of creating our digital library". After the letter of the Heads of State and Government, which was a kind of invitation to the Commission to take initiative, then Mr Barroso replied positively: "yes, the Commission agrees". On 30th September 2005 there was the Commission Communication announcing the strategy and the measures to be taken. The idea was not to create a new European public body, with a formalised structure. We thought that the collaboration between national libraries, museums, archives and audio-visual archives had to be kept as light and flexible as possible. And also let these institutions determine autonomously their way forward. So the involvement of the Commission in Europeana as such was mainly political support, facilitation and financial support. Co-funding was provided mainly through the eContent and eContent plus programmes; later through the CIP– Competitiveness and Innovation Programme, which is a rather large container of initiatives, but has a dedicated part which is continuing activities on digital content, including digital libraries. Through open calls for proposals the Commission started co-financing both the "Europeana hub" [the central office running the web service] and the content to feed the service– digitisation to a certain extent, but in particular the aggregation and delivery of content (metadata) to Europeana.

[**JO**: so the Commission's involvement was not about giving a strong guiding hand about what you wanted?]

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LM: Yes, we always thought that the cultural institutions are the content owners and they should find their own way through autonomously. There is good collaboration established, for example, between national libraries (e.g. CENL, Conference of European National Librarians), between video and film archives (e.g., ACE, the European Film Archives Association), and several museums 'associations at European level. What was more difficult was to facilitate collaboration between these sectors, which sometimes operate like silos. With digital technologies, traditional cross-domain barriers tend to disappear. That is something that we were well aware of and we tried to facilitate the process.

A new legal body was created by cultural institutions in November 2007, the European Digital Library Foundation (later re-named Europeana Foundation), which is a legal entity under the Dutch law. It was established in The Hague due to the fact that the Royal Dutch Library had offered to provide the headquarters for the Europeana Office. Then we went on preparing the launch in 2008. That was a relatively big event, 20th November 2008. That was an event that brought together most of culture ministers of EU countries in Brussels. The event was hosted in the Royal Belgian Library, and it enjoyed the presence of Commissioner Viviane Reding, President Barroso, and the president of the Europeana Foundation, Elisabeth Niggemann. The site was opened and due to a quite high media attention it experienced a performance problem: as it often happens at website launches, the site was victim of its success, it crashed under an overload of requests. The site had to stay closed for some weeks in order to upgrade the infrastructure, and then re-opened.

Since 2009 the number of cultural objects accessible via Europeana has been growing steadily, and also functionalities have been constantly improving: multilingual tools, search facilities, interactive facilities: the user experience is gradually improving. I believe the Europeana story is a good case of a European project that is based on soft policy means – mainly co-financing and political support. But we also addressed framework conditions to facilitate online access to cultural content.

The digital libraries initiative was broader than Europeana, its most visible part. At the same time we have to provide support and facilitation for digitisation and aggregation of cultural content, but we need also to work on regulatory issues, for example on the difficult IPR-related issues. We set up more "expert groups": first we had a High Level Expert Group on digital libraries, chaired by Commissioner Reding, then we had a Comité des Sages on Bringing Europe's Cultural Heritage online. These groups supported the development of the recommendations to Member States, and of the directive on orphan works which is being discussed by the Council and the Parliament.

[**JO**: this hotline to power is one of the distinctive things about Europeana. What would you say are the legal changes and conditions that the Commission has had an impact upon?]

 LM: Let's see how the discussion on orphan works goes, that would be a certain advancement. We used not only "hard legislation", we used also what we call "soft legislation" (legally non-binding) – namely recommendations. There's a Commission recommendation on digitisation and digital preservation of cultural heritage, the first version was adopted in October 2011. Public-private

partnerships for digitisation were spotted as an opportunity and a challenge. It would be very complex and difficult to provide specific regulation on this. Sometimes it is preferable to avoid over-regulation, but to keep a policy pressure through other means. Public-private partnerships for digitisation started being used widely, the most important cases were the partnerships involving Google and first many American libraries and then also European libraries. In particular the first agreements between Google and the libraries provided conditions that were not optimal in terms of guaranteeing access to public domain works. There were exclusivity periods in favour of the private partner that were very long: 20-25 years of preferential conditions for the private partner. Of course it is the private partner that is engaging and financing digitisation; they need to have a certain return on investment. But we considered that this period should be much shorter. In the current recommendation there is an indication that this should be seven years maximum. We've seen a certain impact of the recommendation: the more recent agreements had much shorter periods of preferential use. So this is an example where we had an impact. The strong message we gave is "public domain material should remain in the public domain also in the digital world". Sometimes when you digitise there are claims that new IPR is created, and this risks locking up public domain material that instead should remain easily available online, as well as re-usable.

[**JO**: and there's the PSI side of things]

LM: Yes, access to cultural heritage is linked with public sector information policies. The revision of the PSI directive that the Commission is proposing,

includes also material that is held by cultural institutions. Secondly, there is an issue with metadata: Europeana developed a Data Exchange Agreement, whereby content providers allow for the re-use of the metadata they provide. This was a difficult discussion with cultural institutions, not all were in favour of releasing their metadata in an open way. We now see a certain convergence between cultural heritage online and the open data approach.

[**JO**: how much was the timing of the PSI amendment coordinated with the DEA, in order to make the latter more palatable?]

LM: Well, we are working on the two dossiers in parallel [cultural heritage data and public sector information], and of course we tend to see things as linked. We are a relatively small unit, we are not more than fifteen people, including support staff, working on all this.

[**JO**: Who do you identify as the key stakeholders that Europeana have to pay mind to?]

LM: As I mentioned, we had a stakeholders group, the High level expert group on Digital Libraries, which operated until 2009. The group was formed by 20 stakeholders that we put around the table to discuss difficult issues: copyright for digital libraries, open access to scientific information, digital preservation, public-private partnerships. Members included: representatives of publishers - Europeana always paid a particular attention to publishers, with a view of having in-copyright books searchable and accessible; representatives from national libraries, archives, film and audiovisual archives, and museums; of science journals and research associations; of rights holder organisations, newspapers,

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copyright experts, IT industry. These were the kind of organisations that we had identified as stakeholders: cultural institutions of different types; publishers – book, newspaper and scientific journal publishers –; the scientific research community; IT industry; legal experts.

Another group we had set up was a much smaller group, the so-called Comité des Sages: Elizabeth Niggemann [director of the DNB], Maurice Levy, [CEO of French advertising agency Publicis], with a strong interest in the digital world, and a Belgian writer and journalist, Jacques De Decker. Another group with whom we continue to work is the Member States Expert Group on digitisation, composed mainly by representatives from cultural ministries or cultural institutions of the 27 EU member states, plus the European Economic Area countries. The group is not directly involved in the governance of Europeana but is connected to the implementation of the recommendation on digitisation and digital preservation. Beyond exchanging best practice, the group helps to monitor and facilitate the implementation of the recommendation.

[**JO**: so you use these groups both to help to develop policies, and to be accountable to?]

LM: yes, I would say so.

[**JO**: What results does the EC expect from Europeana & how does it expect to measure them? Is there a concrete list of objectives?]

LM: The first objective was to create and to launch it; after the launch, a particular focus was placed on an easily measurable objective, which is the number of digital objects that are accessible. Currently we have about 20m, by

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2015 the target is 30m. The vision is "all European cultural heritage accessible through Europeana". Whatever cultural heritage means! Beyond this, we think Europeana is a new way of accessing cultural heritage online, and Europeana can be a driver in terms of creativity and innovation, but also for learning and education in Europe. These objectives are more difficult to measure as such. We will need to look at usage statistics. It's been improving, but currently we are not yet 'there' in terms of use . The proposed Connecting Europe Facility programme should support Europeana in the future. For the period 2014-2020, the Commission proposed that Europeana becomes one of the strategic digital infrastructures in Europe, an infrastructure dedicated to access and reuse cultural material. All this is based on an intervention logic assuming that Europeana, and more generally access to cultural heritage online, can bring benefits in terms of economic growth ,jobs, but also societal objectives.

[**JO**: in terms of measurement, is there going to be some effort to gauge the economic and social impact?]

LM: This is a technically difficult problem. We conducted some studies, with no conclusive evidence. Measuring access and downloads from the web is relatively easy; developing models that get to socio-economic impacts is much more complex. It's probably easier with open data, because you could find evidence that new applications and new services are built based on open data that were released. With cultural content, it's more difficult, for example when one tries to assess the educational impact, and the indirect economic benefit generated by this. It is clear that the e-books market could benefit from cultural content online. Certain companies already provide, for example, public domain digital

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books for free through their distribution platforms – together with paying material. This is an incentive to the user, they also provide for free both in-copyright and public domain works. That's an example where it should be possible to measure the impact. We can argue these impacts exist, we firmly believe there are economic and social benefits by making cultural content more easily available through Europe. Providing measures of these impacts, this is something we're working on.

[**JO**: So if the CEF goes ahead, the support for Europeana should be there until 2020. Beyond 2020, though, does LM have an idea of how the EC would decide how effective Europeana had been and whether to continue to support it? Is it too early to know?]

LM: We are currently using more qualitative models. In the framework of the Connecting Europe Facility, if adopted as proposed, we will try to develop more accurate and quantitative models for monitoring. We estimate the cost of digitisation –that is not a cost to be paid at EU level, rather at national – to be in the order of €100bn. So we know the cost is huge, but the digitisation gap will be closed, because more and more material is now available in native digital form. A question is if and how to prioritise. Should we digitise all what is the backlog of the past? Or should we prioritise what is most requested or valuable? So there are alternative models: one is mass digitisation, like Google did so far. But in the financial crisis context, now the other option is called boutique digitisation": one should base digitisation on user requests. Today, it is not yet clear what model will be the winning one.

In terms of funding, we consider digitisation efforts as an investment, and we encourage member states to use, for example, structural funds for digitising their content. We really should think about the new digital services, that are made possible thanks to large amounts of digitised content.

[**JO**: so the digitisation funding is not part of Europeana but the Commission sees those funding streams as tightly wrapped in with it]

LM: If you read the 2005 communication, it is clearly stated that organising and funding the digitisation is primarily a responsibility of Member States (meaning national, regional or local authorities, or cultural institutions in Member States). Europeana is not about digitising, it's about aggregating content and making it available. Therefore EU funding for Europeana shouldn't co-finance digitisation projects as such. This principle was qualified: the EU can finance digitisation projects if there is a clear EU added-value. If there are dispersed collections around Europe about the same author/topic, to bring them together you need to work on metadata to make aggregation possible. But one could add to the project a digitisation layer. This is why the eContent Plus and CIP programme have also funded digitisation. And we've been fostering research on digitisation, we have projects on state-of-the-art digitisation technologies under the R&D programmeas. Constantly we've been giving a strong message to Member States: make use of EU structural funds for digitisation. Structural funds are not community programmes, they are not managed by the Commission. they are part of the EU budget, but the actual use of these funds, that are linked to regional and social development objectives, is mainly in the hands of Member States. They can choose how to define the general priorities, and they are actually

implemented by Member State authorities. To conclude, we have here an example of application of the famous subsidiarity principle: the EU shouldn't be funding national digitisation as such, unless it's through the use of these structural funds. The EU can support digitisation projects with a high EU added value.

[**JO**: do you see Europeana now as a piece of infrastructure rather than an end-user experience in itself?]

LM: I don't see these as two alternatives. I think Europeana more and more needs to be conceived as an infrastructure. An infrastructure is a service with a permanent feature, and it has a technical component. One normally thinks about a road network. This is both an infrastructure, and it enables a user experience.

[**JO**: it enables other things to be built on top]

LM: yes exactly. Telephone networks are also infrastructures, and they clearly provide an interesting user experience, right? So I think the two go together. I really like the concept of cultural heritage online as one of the key European infrastructures, this is new. Let's see now how the political discussion of CEF and then its implementation will go. In terms of building a European identity and integrating Europe, Europeana is also an impressive tool: Europeans can more easily discover their country's culture as well as other countries' culture. This clearly contributes to an idea of European culture, a good thing!

[**JO**: and as for its sustainability for the medium term, Europeana can feel OK for now?]

LM: well, that depends now upon the discussion with the Council and European Parliament. That will take at least another year. For now up until 2013 we have a certain financial framework, which ensures short term viability. After the end of 2013, nothing is certain: the Commission proposed the CEF, but these are times when everything is put into question and nothing can be taken for granted, and we have to live with that. In a way, every service has to demonstrate its usefulness. Luxuries and gadgets are not allowed. But I'm quite confident Europeana has already found an identity, and it will find its way through this difficult context.

We talked in the week that the CCPA met for the first time since the announcement of the DEA and converted into the Europeana Network, followed by the 2 day DISH conference. The Skype call was poor quality, resulting in some gaps in the transcription below. We subsequently reverted to the telephone for the bulk of the conversation, for which notes were made and included below edited for comprehensibility.

1.1.1 *TRANSCRIPTION OF SKYPE CALL*

[**JO**: as an aggregator of content into Europeana as well as representative of many other content owners and aggregators, who do you see as its chief stakeholders, whose interests do you feel it needs to serve?]

NP: Aggregation is at the intersection of lots of different sets of interests; you have to characterise those interests but it's important not to homogenise. And end-users: you realise that's 6.7bn people?! That might be a slightly portmanteau approach. What we try and talk about is flows of value. The interesting thing about aggregation is it's supposedly sits right in the middle of a whole set of value propositions which point in both directions. On the one hand you're trying to articulate a value proposition to the end-user that is about critical mass, quantity, access, and [to] promise lots of engagement. On the other end you're trying to articulate a value proposition to the content providers that is about reach [*unclear*]. For the market place I think the value proposition is different in the sense that more is better, [which] actually means market saturation – which means you're directly undermining the market valuation [of commercial bodies]. So it was really interesting talking to commercial providers at the Europeana

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Network event at the beginning of the week, because from their point of view, we're going for dumb quantity which simply has the effect of hyper-inflating the market, hyper-inflating the supply and undermining their value proposition, so I think the success criteria for those different groups are in opposition, to some extent.

I also think characterising people as end-users will mean a spectrum from co-creators, for people who are into participatory culture, all the way through to my mum, who wants a heavily curated experience, a very led thing that she doesn't have to think too hard about. So we are trying to satisfy both ends of that market. And one end of that market wants serendipity, wants to be able to discover and make stuff [*unclear*]; the other end of that market wants *A History Of the World in 100 Objects*. So characterising those as the same need I think in some ways undermines them. Within it all, if you sit Europeana at the nexus of those value propositions, it's almost impossible to do the right thing, because some of them are in opposition and some are susceptible to over-simplification. So they're necessary in terms of business planning, but what they don't lead to is a clear, singular focus for what the actual service is supposed to be doing. Which means, as in all things, that you have to make choices. It's most often the case – it's the case with Culture Grid, it the case very often with aggregators – that there's usually one customer, and the customer is *not* the end-user [*unclear*], the customer is actually the political will to do something about [*unclear*] digitise cultural content, and so this means the whole culture of aggregation at the moment is a step along the way to releasing a critical mass of assets in order to [reach] what I think will come next, which will be service layers which

disintermediate and make sense of this. And I think it's when you're tested on being a service that it will become clear what the actual proposition is.

[**JO**: so the chief customer is the European Commission?]

NP: Yes if you look at the evolution of Europeana, Europeana is a political assertion of something called European culture, which was a squarely political agenda [...] If you fast forward a while, it's been through a technical wringer where people wanted it to be [*unclear*] exhibitions, thematic things. So it's going through the same thing everybody else is but it's undeniable it started [through the will of the EC]

1.1.2 *TELEPHONE NOTES AND QUOTES*
NP on the role of politicians: "Europeana came from an assertion of something called 'Europe'", as a reaction to Google books especially from France. Following from that came the engagement of other groups that were interested in the technical questions, EDM, aggregation and the rest.

Europeana now "presents itself as a public-facing proposition." It's "never had to demonstrate itself as a usable public service", because it came about without that being a precondition but because of political motivations, unlike commercial alternatives (NP mentioned HistoryPin). It lacked a theme or a thread to give it a purpose. Now Europeana is trying to do this with things like the first world war project and the art exhibitions (such as Art Nouveau).

[**JO**: did this apply to just the portal or the infrastructure too? Because it's a pipe that should be able to serve various themes]

NP: Yes, it's a pipe so it needs to persuade content providers to provide content. So themed use-cases help this [presumably implying a user interface]. So it applies to the whole thing really.

What will change it is the DEA, which is "the first time people have had to make a decision...to sign away something." The DEA highlights the tremendous differences between domains: "a bibliographic record is an assertion of fact but a museum record is a narrative assertion that may change over time", which helps to explain the different attitudes of libraries and museums. "It's a real test for Europeana and for aggregators like ourselves."

[**JO**: What does it mean for Culture Grid?]

NP: "Some people think the DEA is more than it is – a rich record", understanding it to mean derivatives too. Collections Trust wants to get agreement from its content providers so it needs to do an advocacy job, although it could just sign the DEA anyway – there is an effective open licence over the CG data.

Europeana is a "Trojan horse for the open content/open rights lobby" that are making claims that Poole is dubious about. "One assertion is that for something to be linked open data it must be public domain/CC0", and he's "pretty sure this is not true".

Re consultation over the last year: "the consultation has not been on the side of the sector...it's been over the assertion of an untested hypothesis....Now is when the consultation really happens". He expects some mutiny and that Europeana may have to allow content providers to control their own licences. Over the next

6 months "they'll see significant losses". If they see this amongst museums they will have to rethink.

"Europeana Inside" project may feed into this. SPECTRUM partners are building into their collections management workflow checkboxes for rights management over data and for enabling control over what data flows to what destination.

The DPLA, Digital Public Space and Australian activities are forcing people [content owners] to rethink.

Culture Grid and Europeana will over the next few years become understood and accepted as interfaces or services.

Google Art Project is fascinating. Although Google has a wide spectrum objective, it is doing something niche here. It is about "preparing the conditions for other things to happen".

The majority of aggregators are struggling to survive. Who else, like Digital New Zealand, has managed to connect content providers to end users? This will be important for them to survive.

"Cogent thoughts" from Ed Vaizey: "technology has moved on to the point where aggregation becomes obsolete" (which is his reason for not contributing to Europeana). The problem is that this is not yet true.

After all this, why is he still on board with Europeana? Technology projects come and go, content comes and goes but despite the turnover we continue to advance technical knowledge and relationships. Europeana "brings together an alliance of people". The technical proposition/outputs are interesting. The user

interface/portal less so. The network, though, is very important. It is the cultural sector's marker at the table that allows it to be part of the digital debate at European level.

NP wanted Europeana Network to have a collective voice. If its members don't see it as anything they can control then it will fail. At the moment "I don't think the community feels a sense of ownership".

[**JO**: can this be improved?]

NP: either the DEA will be broken [by abstentions], or the Network will find its voice and influence it.

[**JO**: is there more to do at a national level? Because building enthusiasm for a European offer and its related KPIs is difficult, whereas people can understand what making a contribution to a UK service/collaboration means.]

NP: Eurovision is the best example of strong (albeit cartoonish) national identity in the context of a shared European identity. There is none of this in Europeana, although NP has been making the case for finding a way of presenting national identity within the European one.

Suggests that dashboards could be used to show value at various levels. In the case of the Collections Trust's schools database this means metrics at organisation, region/LEA, and national level. Europeana needs to be providing stats to all levels (institution, regional/national, and overall).

2 ABBREVIATIONS

ACE	Arts Council England
API	Application programming interface
AHRC	Arts and Humanities Research Council
BL	British Library
BMICE	Business Model Innovation Cultural Heritage (=*erfgoed*)
CAN	Collections Australia Network
CCPA	Council of Content Providers and Aggregators
CCPDT	Capital City Project Delivery Team
CdS	Comité des Sages
CENL	Conference of European National Librarians
CHIN	Canadian Heritage Information Network
CIIM	Collections Information Integration Module
CLIR	Council on Library and Information Resources
CMS	Content management system
CollMS	Collections management system
COPDB	Collections Online Project Delivery Board
CT	Collections Trust
DCC	Digital Curation Coalition
DCMS	Department of Culture, Media and Sport
DEA	Data Exchange Agreement (Europeana)
EC	European Commission

EDL	European Digital Library
EDM	Europeana Data Model
FOSS	Free and open-source software
GWA	Great War Archive
HATII	Humanities Advanced Technology and Information Institute
HLF	Heritage Lottery Fund
ISB	Invest-to-Save Budget
ITT	Invitation to tender
IWM	Imperial War Museums
JISC	Joint Information Systems Committee
KB	Koninklijke Bibliotheek (Royal Dutch Library)
K-Int	Knowledge Integration
MA	Museums Association
MLA	Museums Libraries and Archives Council
MMW-O	Making the Modern World – Online
MoL	Museum of London
MSEG	Member States Expert Group
MWR	Mackenzie Ward Research
NDIIPP	National Digital Information Infrastructure and Preservation Program
NINCH	National Initiative for Networked Cultural Heritage
NISO	National Information Standards Organization
NMSI	National Museum of Science and Industry
OAI	Open Archives Initiative

Ofcom	Office of Communications
OGL	Open Government Licence
ONS	Office of National Statistics
PNDS	People's Network Discovery Service
PPD	Project proposal document
PSC	Peter Symonds College
PSI	Public sector information
ROI	Return on investment
TEL	The European Library
UGC	User generated content
VMN	Variable Media Network

PEOPLE

AN	Andrew Nahum
CR	Cathy Ross
CS	Claire Sussums
DE	Daniel Evans
DH	David Haskiya
HV	Harry Verwayen
JC	Jill Cousins
JM	Jan Molendijk
JO	Jeremy Ottevanger
LD	Louise Doughty
LM	Luca Martinelli
MF	Martyn Farrows

NP	Nick Poole
RB	Robert Bud

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Ancestry.com : http://ancestry.com

Apache License 2.0 : http://www.apache.org/licenses/LICENSE-2.0

Arts Council England: http://www.artscouncil.org.uk

Association of Independent Museums: http://www.aim-museums.co.uk

Black Country History: http://blackcountryhistory.org/

Brooklyn Museum of Art Community:

http://www.brooklynmuseum.org/community/

Brought to Life (Science Museum):

http://www.sciencemuseum.org.uk/broughttolife.aspx

Canadian Heritage Information Network (CHIN): http://www.rcip-chin.gc.ca/

CAMiLEON: http://www.si.umich.edu/CAMILEON/

Collections Australia Network (CAN): http://www.collectionsaustralia.net/

Collections Trust: http://collectionstrust.org.uk/

Creative Commons: http://www.creativecommons.org

Culture.fr: http://www.culture.fr/

Culture Grid: http://www.culturegrid.org.uk/

Europeana: http://europeana.eu/portal/

Europeana 1914-1918: http://www.europeana1914-1918.eu/

Europeana Exhibitions: http://exhibitions.europeana.eu/

EuropeanaLabs: http://www.europeanalabs.eu/

EUScreen: http://www.euscreen.eu/

Exploring 20th Century London: http://www.20thcenturylondon.org.uk/

Find My Past: Findmypast.co.uk

Flickr: http://www.flickr.com

Flickr Commons: http://www.flickr.com/commons/

Free Software Foundation [FSF]: http://www.fsf.org

het Geheugen van Nederland ("the memory of the Netherlands):

http://www.geheugenvannederland.nl/

Google Art Project: http://www.googleartproject.com/

Google Books: http://books.google.com/

Google Maps: http://maps.google.com

InSPECT: http://www.significantproperties.org.uk/

Internet Archive: http://archive.org/

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http://www.museumoflondonarchaeology.org.uk/laarc/catalogue/

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Map Warper (New York Public Library): http://maps.nypl.org/warper/

National Digital Information Infrastructure and Preservation Program (NDIIPP):

http://www.digitalpreservation.gov/

Open Data: http://www.opendata.org

OpenStreetMap: http://www.openstreetmap.org

PRONOM : http://www.nationalarchives.gov.uk/PRONOM/Default.aspx

Second Life: http://www.secondlife.com

UK Government Data: http://data.gov.uk/

UKOLN: http://www.ukoln.ac.uk/

UK Web Archiving Consortium: http://www.webarchive.org.uk/

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