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The impact of inadequacies in the treatment of organizational issues on information systems development projects

Neil DOHERTY¹, Malcolm KING² and Omar AL-MUSHAYT³.

Abstract: *It has often been argued that systems' failure may result from inadequacies in the treatment of organizational issues, but there is little consensus on what is meant by the term inadequate treatment and how it influences the systems' success. To test several theoretically plausible hypotheses. A questionnaire was mailed to senior IS executives and 344 valid responses were received. The results of a statistical analysis indicate that higher levels of systems' success are associated with treating a wide range of organizational issues throughout the development process and ensuring that members of the user community are actively involved.*

Key words: information systems; systems development; systems success; organizational issues

Section: Research

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1 Introduction

There is a wealth of evidence to suggest that organizations are spending vast sums of money investing in information and communications technologies (ICTs), with the expectation that these will make a significant contribution to their organization's efficiency, effectiveness, and competitive positioning. For example, it has been estimated that large organizations are now spending up to 50% of their total capital expenditure on ICTs [36]. However, in parallel with this increased investment has come increased concern with the quality and performance of these technologies. For example: Hochstrasser & Griffiths [20] suggested that up to 70% of IS projects fail, and an extensive review of systems development practices by Clegg *et al* [8] found that:

up to 90% of all IT projects fail to meet their goals; 80% are late and over-budget and 40% are abandoned.

The rise in systems failure is a result, at least in part, of the increasing organizational impact of information systems (IS). Previously the authors have noted that the organizational role of IT has changed greatly over the past 20 years, or so, and the key aspects are summarised in a table 1. From this it is clear that systems are now far more strategically focussed, widely spread, and high interconnected. This in turn has greatly increased the organizational impact of systems. The implementation of an IS now has the potential to impact upon an organization's culture and structure, necessitate the re-design of business process, individual tasks and job descriptions, engender changes in the behaviour and attitudes of individual employees, and alter the distribution of power.

Table 1: The changing organizational role of IS / IT

	Early Perspective		Current Perspective
Primary aim	Operational: To enhance productivity /efficiency		Strategic: To enhance competitive positioning
Associated organizational change	Limited: Automation of existing processes		High: Re-engineering of key business process and working practices
Spread	Narrow: Systems support a limited range of areas		Wide: Systems support all major business processes.
Inter-connectivity	Low: Ad-hoc systems, 'islands of automation'		High: Enterprise-wide and inter organizational systems
Stakeholder Participation	Low: The debate on IT is limited to technical specialists		High: All stakeholders, especially users, are encouraged to participate
Systems development & support	Highly centralised: IT the responsibility of a centralised function		Decentralised: Systems' support is distributed throughout organization
Information provision	Formal reports: Managers are limited to a menu of pre-written reports		Database interrogation: Managers use query tools to capture information
Organizational Consequence / Impact	Low: Organization continues to operate as it always has		High: IT has the potential to completely re-design the organization

If these impacts, commonly referred to as '*organizational issues*', are not proactively managed as an integral part of its development, there is likely to be a damaging mismatch between the capabilities of the systems and the characteristics of the host organization. Indeed, it is generally agreed that the unacceptably high levels of systems failure are primarily the result of inadequacies in the treatment of organizational issues, rather than problems with the technology (e.g. [15], [27], [28], [29]). However, there still seems to be no common definition of the term '*the treatment of organizational issues*' and little clear appreciation of the nature of these '*inadequacies*.' The first of these can be rectified relatively easily, as a definition can be synthesised from its previous usage in the literature. However, an understanding of the nature of the '*inadequacies*' is harder to establish with any certainty. For example, '*inadequate*' may relate to the range of issues treated, the nature of the treatment, or even the depth of the treatment. The primary aim of this paper is, therefore, to address this issue by exploring some possible explanations of the relationships between systems success and the treatment of organizational issues.

2 Research Motivations and Objectives

2.1 The 'Treatment of Organizational Issues' Defined

The debate on the roots of systems failure has increased levels of interest in the role of '*non-technical*' aspects of systems development [6]. However, it is only recently that the term '*organizational issue*' has come into common usage [18, 24]. The increasing use of the term motivated the authors to develop a provisional definition, which has, over the course of a number of pieces of work ([1], [11], [12]) been refined into:

'Organizational issues are those which need to be treated during the systems development process to ensure that the human, social, and economic impacts of the resultant computer-based IS are likely to be desirable.'

An important constituent of this definition is the term '*treated*.' We previously suggested that there are two key components to the concept of treatment, '*evaluation followed by action*.' Consequently, a systems development team should evaluate the likely impact of their system on the host organization's working practices and culture. If an undesirable impact is detected then it is important that some action is taken to negate the impact. Conversely, if a desirable impact is detected, action might be taken to further exploit it.

When considering the characteristics of such impacts, it is important to make the distinction between those that can be classed as planned impacts, as opposed to those that can be classified as incidental, as follows:

- **Planned impacts:** Some impacts are clear and critical outcomes. These are an integral part of the system's design from the start. For example, the planned impacts on an organization's performance must be established at the outset: how will the system contribute to an organization's efficiency, effectiveness, and competitive positioning?

- **Incidental impacts:** Other impacts are by-products. For example, the implementation may alter the organization's power distribution, structure or working practices in ways that had not, or could not have, been envisaged at the outset. The underlying assumption of this paper is that the vast majority could be predicted at some point within the system's development, with careful and systematic analysis. It should be noted that the concept of '*incidental impacts*' is similar to FitzGerald's [16] '*second order effects*.'

2.2 The Treatment of Organizational Issues

Much of the research effort in organizational issues has been devoted to '*socio-technical*' approaches, in which technical and organizational aspects are considered to be equally important. These explicitly target the treatment of organizational issues and can be divided into three broad categories:

1. **Socio-technical methods:** These adopt a more explicit organizational orientation. Prominent examples of these include: Ethics [31], Multi-view [3], Soft Systems Method [4] and Joint Application Design [40].
2. **Tools for the treatment of specific issues:** Researchers, such as Clegg *et al* [7], have attempted to develop tools and techniques to aid in the treatment of specific organizational issues.
3. **Organizational impact analysis:** Both Laudon & Laudon [23] and Sauer [38] have made the case for an separate and explicit study of the way in which a proposed system will affect organizational structure, attitudes, decision-making, and operations.

Each of the above contributions has increased our understanding of the nature and treatment of organizational issues, but there is little evidence that these contributions have made much of an impact on the practice of systems development. As Clegg [9] notes, '*socio-technical principles and practices have not had the impact that their proponents might wish*.' This view is supported by Mumford [32] who notes that: '*management tended to regard these successful (socio-technical) projects as one-offs; there was no great enthusiasm or motivation to spread the approach through their companies*'

This raises the question, if organizations are not using purpose-built socio-technical approaches to ensure that organizational issues are appropriately treated, then how are these issues being addressed? In a recent study, the authors found that 60% of the sample organizations claimed to be treating organizational issues through a variety of '*explicit*' interventions, whilst a further 27% treated them '*implicitly*', but in the remaining organizations (13%), organizational issues were '*rarely considered at all*.' This suggests that many organizations are starting to treat organizational issues, but probably using a variety of '*home grown*' or pragmatic interventions, rather than employing purpose-built socio-technical approaches. As Eason [13] notes '*organizational issues are tackled in an ad hoc way whenever they emerge, which is often after the system has been implemented*.' Given the significant variability in their treatment, it is important to explore the relationship between systems success and the ways in which organizational issues are treated.

2.3 Theoretical Model and Research Hypotheses

From the literature, it is possible to formulate three distinct research propositions, which are based on different interpretations of the term '*inadequate*.' These lead to a number of hypotheses, which will be explicitly tested. The term '*successful systems*' also features in each of the hypotheses and is operationalised as a number of distinct, yet complementary success measures. The three propositions, with their accompanying hypotheses, are:

1. Many organizational issues are not being treated in systems development projects:

Systems development projects are typically technology-led and consequently, even where organizational issues are treated within the development project, the approach can be characterised as "*too little too late*" [25]. In other instances, issues are not even considered until the system is fully developed; as Poulymenako and Holmes [34] suggest this involves '*implementing a system and then trying to adapt it to its organizational context*.' This leads to the following hypothesis:

- **H1a:** Those organizations that treat an individual organizational issue are likely to have higher levels of systems' success than those that don't.
- **H1b:** Those organizations that treat more organizational issues, as an integral part of the systems development project, are likely to have higher levels of systems' success than those that treat fewer.

2. Organizational issues are being treated, but at the wrong time: Many commentators have highlighted the need to treat issues in the early stages of a systems development project [14]. As Ahn & Skudlark [2] note: '*unless those [organizational] issues are handled before ISs are designed and implemented, the IS will be more likely a failure than a success*.' The importance of proactively addressing organizational issues has also been highlighted by Clegg who commented that developers should '*trace the possible impacts*' of all design choices, prior to developing a system. This leads to the following hypothesis:

- **H2a:** Those organizations that treat an organizational issue at the outset of a systems development project are likely to have higher levels of systems' success than those that treat it at a later stage.

It has also been recognised that it may not be possible for system designers to anticipate all the impacts of their design, as these may only come to light at a later stage. This leads us to add:

- **H2b:** Those organizations that treat an organizational issue in more than one phase of a systems development project are likely to have higher levels of systems' success than those that don't.

3. Organizational issues are being treated, but by the wrong people: Issues are typically overlooked or mishandled because the systems development team is primarily composed of technologists As Hornby *et al* [21] note, systems developers:

'do not claim to have knowledge of organizational issues in IT systems, and there is no evidence that they are encouraged or rewarded for considering such issues. They

are rewarded in the main, for delivering technically sound systems on time and to budget.'

Whilst this quotation adds further weight to the first proposition, there is also the possibility that issues are being treated by technical specialists, who are ill equipped to do so and thus the treatment is unlikely to be effective. The following hypothesis is therefore proposed:

- **H3:** Those organizations where members of the user community are actively involved in the treatment of an organizational issue are likely to have higher levels of systems' success than those where users are not involved.

We felt that significant contributions would be made by exploring these hypotheses, as summarised in figure 1. It was also anticipated that the results of the analysis would be of interest to the business community as concerns about the quality of IS should be near the top of the agenda of the vast numbers of executives who have to suffer the consequences of poorly functioning systems.

3 Research Design

We used a combined quantitative and qualitative approach, as advocated by Miles & Huberman [30]. A detailed questionnaire survey was used to identify relationships between the key research variables, and this was followed by a series of focus groups, which sought to explore the nature of any significant relationships.

3.1 Questionnaire development, validation and targeting

The questionnaire was organized into three sections:

1. **The Treatment of Organizational Issues:** We used the list of fourteen distinct organizational issues shown in table 2, which had been used and validated in our previous research. The treatment of each issue was operationalised as a simple, dichotomous 'yes' / 'no' variable, in response to the question: *'is this typically considered during a systems development project?'*

Table 2: Organizational issues variables

Category	Specific Issues
Organizational Contribution: Those issues related to the extent to which a proposed system will make a significant positive contribution to the organization's economic or operational performance.	<p>Current Business Needs: The proposed system's ability to satisfy the organization's current business needs.</p> <p>Information Systems Strategy: The proposed system's alignment with the current information system strategy</p> <p>Prioritisation: The prioritising of development effort on those aspects which address the most important business needs.</p> <p>Future needs of organization: The proposed system's ability to satisfy the organization's likely future business needs.</p> <p>Process re-engineering: The proposed system's impact on the design of key business processes.</p>
Human Centred Issues: This category focuses upon whether human issues are adequately addressed in the systems development process.	<p>Health & safety / ergonomic factors: The ergonomic and health & safety implications of the proposed system.</p> <p>User motivation / needs: The proposed system's ability to satisfy user needs and motivations.</p> <p>User working styles and personal skills: The implications of user working styles and personal skills for the system's design and training provision.</p> <p>Job redesign: The proposed system's impact on the design of working practices.</p>
Transitional Issues: This category is concerned with the extent to which practical transitional issues are addressed.	<p>Timing of Implementation: The interaction of the system's implementation with other planned concurrent changes.</p> <p>Organisational disruption: The temporary organizational disruption that may be caused by the implementation of the proposed system.</p>
Organizational Alignment: This group of issues focuses upon the extent to which a proposed system and its host organization are matched.	<p>Organizational structure The system's effect on the organizational structure.</p> <p>Organizational culture: The proposed system's impact on the culture in the organization.</p> <p>Organizational power: The proposed system's political implications for the distribution of power in the organization.</p>

If a respondent answered yes to the treatment of a specific organizational issue then they were asked to specify in which phase / phases of the systems development cycle the issue was most commonly treated [feasibility study; analysis / design phase; implementation]. Moreover, the respondent was also asked to indicate whether it was the users or the systems developers who were typically responsible for its treatment. A sample part of this section of the questionnaire is presented in figure 2.

Figure 2: The format of the questionnaire section relating to organizational issues

C: Organizational Issues

Please read each statement carefully in turn. If you **typically consider** this issue in your Information System Development Process (ISDP), please tick **YES** in section **A** and answer the other three questions on the right side **B**, and **C**, if you **do not consider** it, please tick **NO** and go to the next statement.

	A. Is this issue typically considered?		B. At which stage(s) do you typically address this issue? <i>Tick more than one if applicable.</i>			C. Who is (are) the most likely individual(s) to be responsible for treating this issue?	
	NO	YES	Feasibility	Analysis / Design	Implementation	System Developers	Users/ Managers
Organizational Issue 1	☐	☐ →	☐	☐	☐	☐	☐
Organizational Issue 2	☐	☐ →	☐	☐	☐	☐	☐
Organizational Issue 14	☐	☐ →	☐	☐	☐	☐	☐

2. **The success of the project:** It has long been recognised that IS success is a 'multidimensional concept' [37], which should be operationalised as a range of distinct, yet complementary, measures. The six success measures adopted, which are shown in table 3, were very strongly influenced by the taxonomy of success measures identified by DeLone and MacLean [10].

Table 3: Item measures for Systems Success

Item	Questionnaire wording
Systems Quality	Information systems projects achieve high levels of system quality (e.g. system's reliability, features and functions, response time).
Information Quality	Information systems projects achieve high levels of information quality (e.g. information's clarity, completeness, usefulness, accuracy).
Information Use	Information systems projects achieve high levels of information use (e.g. regularity of use, number of inquiries, duration of use, frequency of report requests).
User Satisfaction	Information systems projects achieve high levels of user satisfaction (e.g. overall satisfaction, enjoyment, difference between information needed and received, software satisfaction).
Individual Impact	Information systems projects achieve high levels of individual impact (e.g. problem identification, correctness of decision, decision effectiveness, time to take decision, improved individual productivity).
Organizational Impact	Information systems projects achieve high levels of organizational impact (e.g. contribution to achieving goals, cost/benefit ratio, return on investment, service effectiveness).

3. **Demographics:** Demographic information [organizational size and sector] was also collected so that the potential moderating effect on the statistical analyses could be explored.

The questionnaire was initially validated through a series of pre-tests that sought to assess the questionnaire's content, clarity, question wording and validity. Nine experienced IS researchers and ten senior IT professionals participated in the pre-testing and each was asked to evaluate the questionnaire, before providing detailed feedback via interviews. Having made a number of enhancements to the structure and wording of the survey, a pilot study exercise was also undertaken. This provided valuable insights into the likely response rate and analytical implications for the full survey, and indicated that the full study could proceed with little change.

It was recognised that only those individuals who had a high degree of managerial responsibility for systems development projects would be able to comment knowledgeably about the importance of organizational issues and the extent to which they were routinely addressed. Senior IS executives were, therefore, chosen as the '*key informant*' [35]. A list of the names and addresses of senior IS executives, from large UK-based organizations, was purchased from a commercial research organization. The decision to target only large firms [employing more than 250 people] was based on the premise that small firms have few if any dedicated IT staff [33]. A total of 344 valid responses were received from the 2,259 questionnaires mailed out. This represents a response rate of 15.2% which is considered acceptable in comparison to similar types of surveys.

3.2 Sample Characteristics and Evaluation of Non-response Bias

Of the valid respondents, 41% were employed in medium-sized organizations having less than 1000 employees, 34% were based in organizations with between 1000 and 5000 employees and the remaining 25% in larger organizations with over 5000 employees. Whilst the responses were also found to have come from a wide variety of industrial sectors, four were particularly well represented; public sector [25% of sample], manufacturing [22%], financial services [9%] and retail [8%].

When undertaking survey-based research, there is always the danger that the results will be undermined through unintended bias. In this research the possibility of non-respondent bias was evaluated in two ways. Firstly the characteristics of the sample, in terms of organizational size and sector, were compared with the characteristics of the wider population. The characteristics of the wider population were approximated using the 9,374 companies who had a workforce of at least 250 employees, from the '*Financial analysis made easy*' [FAME] database. The results of this analysis demonstrated that the sample was broadly representative, although the incidence of responses from manufacturing firms and larger organizations was somewhat higher than expected.

The second approach to testing for non-respondent bias was through an extensive telephone-based follow-up survey. In total, the researchers attempted to phone 700 IT Directors from the sample. Many of them could not be contacted, or were not prepared to

talk, but the vast majority who did comment indicated that their failure to respond was as a result of either: '*company policy not to respond*', or '*respondent too busy*.' The results of this exercise reassured the researchers that there was no evidence of systematic bias in the non-responding population [5].

3.3 The Design, validation and conduct of focus groups

Greenbaum [17] suggests that a focus group is an ideal mechanism for gaining a deeper and richer set of insights into a particular research issue by listening to, and learning from, a group of knowledgeable individuals. In our case the focus group was primarily used to explore whether any statistically significant associations, identified during the quantitative analysis, were indicative of underlying causal relationships. The focus groups were also used to uncover richer insights into the nature and implications of the relationships and to identify any circumstances under which the relationship might not hold true. A draft interview guide was created to provide a framework for conducting the focus groups. This was then pilot tested by reviewing the questioning route and potential probes with an experienced facilitator of focus groups. A pilot focus group consisting of experienced IS researchers, was assembled to confirm the appropriateness of the wording and sequencing of the questions.

As the original questionnaire had been targeted at senior IS executives, a pool of twenty-five practitioners, all of whom had significant managerial experience of systems development projects, was assembled to participate in this exercise. The willing participants were organized into mini-groups, consisting of 5 or 6 individuals because more in-depth information can be gained from a smaller group. Krueger [22] suggests that there is limited value in continuing with additional groups if no new insights are being generated. In our study, this point was reached by the end of the third group session. Each of the focus group sessions lasted for around 75 minutes.

Each focus group interview was fully transcribed and the material was then rigorously analysed to identify patterns and themes inherent in the responses. In particular, care was taken to consider the intensity, frequency, and extensiveness of comments and to establish the level of internal consistency within each individual group, and between each of the three sessions. The transcripts were relatively easy to interpret, as the level of consistency of response within, and between, groups was very high.

4 Research Findings

To explore the research hypotheses statistically, it was desirable to create an overall measure of system's success by summing the six item measures of success [see table 3]. An underlying assumption and fundamental requirement for constructing a summated measure is that the item scales all measure the same underlying construct. This was confirmed by conducting a factor analysis, which indicated that all six items loaded onto the same factor, and by undertaking internal reliability tests, using the *Cronbach alpha* measure; this yielded a score of 0.75, comfortably exceeding the minimum threshold value of 0.60 [19]. Each of the six item measures was operationalised as a five point Likert scale, and the summated measure had a mean of 21.2 and a standard deviation of 3.4.

4.1 The range of issues treated and the level of success

The data relating to the frequency with which specific organizational issues are typically treated [see table 4] yielded some interesting results. The vast majority of responding organizations typically treat most organizational issues at some point in the systems development process. More specifically, nine of the fourteen issues are routinely treated by at least 80% of the responding organizations, whilst the remaining five are treated by between 20 and 50% of the organizations. This result provides important new evidence that organizational issues are now becoming more commonly incorporated into the systems development process, rather than being considered as an afterthought.

The overall success score was used in one-way ANOVA analysis to examine the difference between the treatment and non-treatment of the fourteen organizational issues on the overall success (hypothesis **H1a**). Table 4 shows that in some instances there is a significant association between the treatment of individual organizational issues and the perceived success of the systems development process. For five issues the association is significant at 1% level or better, and a further issue is significant at the 5% level, but the remaining eight issues do not show a significant statistical association with success at the 5% level. Consequently, hypothesis **H1a** is not fully supported, but is strongly supported on more than a third of the specific issues.

Table 4: Treatment of individual issues and success of IS projects

Organizational Issue	Issue Typically Treated?	Average overall success score			
		Treated (Yes)	Treated (No)	F Value	Significance
IS Strategy	318 (92%)	21.28	19.77	4.9	.027**
Prioritising	297 (86%)	21.29	20.36	3.1	.078
Future Needs	305 (88%)	21.38	19.49	11.3	.001***
Current Needs	331 (96%)	21.16	21.23	0.01	.941
Ergonomics	122 (35%)	21.97	20.72	11.5	.001***
User Needs	284 (83%)	21.50	19.57	17.2	.000***
Working Style	175 (51%)	21.66	20.65	7.9	.005***
Working Practices	296 (86%)	21.23	20.77	0.76	.383
Business processes	307 (89%)	21.28	20.19	3.5	.061
Structure	155 (45%)	21.53	20.86	3.4	.066
Culture	130 (38%)	21.61	20.96	3.7	.055
Power	73 (21%)	21.30	21.12	0.16	.691
Implementation	297 (86%)	21.39	19.74	10.0	.002***
Disruption	274 (80%)	21.29	20.67	1.9	.169

Notes: Figures in brackets represent the percentage of the sample. *** Significant at the 0.01 level; ** Significant at the 0.05 level

In addition, any associations between the '*number of issues treated*' and the overall success score (hypothesis **H1b**) was investigated. The '*number of issues treated*' variable was calculated for each organization by simply counting the number of issues for which the respondent ticked the 'yes' box. Each score was a number between 0 and 14, and had an overall mean of 9.8 issues. The Pearson correlation indicated that the number of issues treated in the system development process is positively associated with the overall success of systems development process and this correlation is statistically significant at the 0.01 level [$r=0.24$, $p = .00$]. It is always possible that the relationship between two variables, in a correlation analysis is influenced by the effect of one or more '*moderating*' variables. In this case it was believed that an organization's size or sector might influence the relationship between the treatment of issues and system's success. Consequently, a partial correlation analysis was undertaken between the number of issues treated and systems success, while controlling for organizational size and sector. The results of this analysis demonstrated that size and sector do not have a moderating effect on the relationship, as the correlation coefficient remains largely unaffected [$r=0.25$, $p = .00$]. This provides reassurance that there is a highly significant relationship between the treatment of organizational issues and the resultant level of system's success; thus hypothesis **H1b** is fully supported.

Having provided some statistical evidence to support both hypotheses **H1a** and **H1b**, it was important to explore the possibility of a causal relationship. The focus groups were, therefore, invited firstly to consider whether there was a causal relationship, then to provide insights into the nature of the relationship and finally to identify any circumstances under which this relationship might not hold true.

There was unanimous agreement among the interviewees. One participant summarised the situation particularly well: '*any system will fail if you don't address its behavioural / organizational context.*' Moreover, the importance of treating various specific issues was also confirmed, particularly organizational culture and structure [39]. As one participant noted: '*you're not going to get the performance benefits you require, unless you look at aligning the organization with the technology, to ensure that jobs are redesigned and users appropriately trained to achieve those objectives.*'

In terms of the nature of the relationship, there was general agreement that project teams tend to focus on delivering technical systems on time and within budget, and therefore generally ignore organizational issues to the detriment of the system's contribution to organizational performance. As one participant commented: '*we installed the SAP system and then figured out what to do with respect to job functions and processes changing*', and another noted: '*typically you get the system in and then you deal with the organizational change.*' Also the failure of project teams' to treat organizational issues appropriately could be attributed to a general lack of awareness: '*Organizations don't seem to recognise that there is bound to be organizational change that is going to take place. The bigger, the more complex the system, the bigger, the more complex the organizational change.*'

Whilst there was unanimous agreement about the importance of treating organizational issues, it was also recognised that it might be difficult to get a consensus on how

organizational issues should be treated. As one participant commented: *'what is best for the organization might not be best for individual users.'* However, another participant concluded with a note of optimism: *'If you look back to when I was first involved in IT, it was really very much a technical drive, with everything was technically driven and very little attention was paid to business needs. I think there is now a greater realisation that looking at the organizational and human issues is actually very important.'*

4.2 The timing of treatment and the overall level of system's success

Whenever a specific issue was treated, the responding IT/IS directors were asked to identify at what stage(s) of the systems development process the treatment usually occurred. The numbers of organizations that routinely treated a specific organizational issue in each of the three phases is shown in table 5. The most significant point to note is that the treatment most often occurs during the feasibility study: at the beginning of the development process. This is important as it suggests that organizations have moved on from the typical reactive treatment approach' and are now treating organizational issues in a more timely and proactive manner.

Table 5: Stage(s) of the systems development process at which the treatment of organizational issues typically occurs

Organizational Issue	Stage (s) in which issue is treated		
	Feasibility Study	Analysis Design	& Implementation
IS Strategy	281 (88%)	128 (40%)	60 (19%)
Prioritising	214 (72%)	125 (42%)	78 (23%)
Future Needs	264 (87%)	118 (39%)	35 (11%)
Current Needs	285 (86%)	160 (48%)	77 (23%)
Ergonomics	53 (44%)	62 (51%)	55 (45%)
User Needs	176 (62%)	165 (58%)	100 (35%)
Working Style	64 (37%)	108 (62%)	84 (48%)
Working Practices	168 (57%)	165 (56%)	136 (46%)
Business processes	218 (71%)	186 (60%)	114 (37%)
Structure	115 (74%)	63 (40%)	49 (32%)
Culture	97 (75%)	48 (37%)	35 (27%)
Power	59 (81%)	20 (27%)	17 (23%)
Implementation	211 (71%)	137 (46%)	143 (48%)
Disruption	113 (41%)	115 (42%)	187 (68%)

Note: Figures in brackets represent the percentage of the sample.

Statistical analyses were conducted to test whether treating an organizational issue early in the development process, e.g. the feasibility study, made a difference to the overall effectiveness of the resultant systems [hypothesis **H2a**], and also to explore whether single

phase or multiple phase approaches were better [hypothesis **H2b**]. There were no significant differences to be found between the three phases and no evidence that treating an organizational issue during the feasibility study was more effective than treating it later, so hypothesis **H2a** is not supported. However, a comparison of success scores between those organizations who treated issues in only one, just two or all three phases provided more interesting results. Table 6 gives the results a one-way ANOVA exploring these differences and shows that the success scores for the three phase treatment approach are generally higher than those for a two phase approach, which are in turn higher than those for a single phase. However, the differences between the one, two and three phase approaches are only significantly different at the 5% level for one issue, namely, the prioritization of development effort. As there is little evidence in support of hypothesis H2b at the level of individual issues, a higher level perspective was sought by exploring the relationship between the overall frequency of treatment and systems' effectiveness.

Table 6: Frequency of treatment and system's success

Organizational Issue	Number of Phases			ANOVA	
	Single Phase	Two Phases	Three phases	F Value	Significance
IS Strategy	21.04	21.52	22.22	2.5	0.083
Prioritising	21.05	21.44	22.63	3.2	0.041**
Future Needs	21.21	21.75	21.85	0.96	0.385
Current Needs	21.06	20.96	21.79	1.3	0.267
Ergonomics	22.22	21.55	21.91	0.53	0.591
User Needs	21.34	21.50	21.98	0.81	0.446
Working Style	21.66	21.77	21.35	0.13	0.877
Working Practices	21.08	21.43	21.53	0.5	0.609
Business Processes	21.30	21.00	21.61	0.62	0.536
Structure	21.41	20.94	23.00	2.76	0.067
Culture	21.32	21.95	23.19	1.94	0.148
Power	21.08	20.67	23.00	1.3	0.281
Implementation	21.07	21.66	21.95	2.02	0.135
Disruption	21.17	21.92	21.28	1.85	0.159

Note: *** Significant at the 0.01 level; ** Significant at the 0.05 level

An 'average number of phases' score was calculated for each responding organization by averaging the number of phases each issue was treated in, for just those issues that were treated. The mean of the average number of phases in which issues were treated is 1.5. Correlation analysis indicated that the overall success of systems development is associated

with the number of phases of the process in which organizational issues are treated; this association is statistically significant at the 0.05 level [$r=0.18$, $p = .030$]. Again, the correlation analysis was repeated, but controlling for the effects of organizational size and sector. The results of this analysis demonstrated that size and sector do not have a moderating effect on the relationship between the treatment of organizational issues and system's success as the correlation coefficient remains largely unaffected [$r=0.120$, $p = .026$]. This result provides reassurance that there is a significant relationship between the treatment of organizational issues and the resultant level of system's success. Based upon this statistical evidence, hypothesis **H2b** is supported. To confirm the researchers' suspicion that there was a direct causal relationship between the number of phases in which an issue is treated and overall system's success, this issue was reviewed by the focus groups.

Once more here was a very high degree of consensus amongst the focus group participants. It was agreed that higher levels of systems success are far more likely to be achieved when organizational issues are considered in more than one phase, primarily because of the evolutionary nature of systems development projects. The groups' views were well represented by one participant who commented: *'I'm not at all surprised by your findings - you've got to keep going back and re-addressing different issues throughout the project.'*

In terms of the nature of the relationship, it was widely recognised that treating organisational across a number of phases was essential in the context of highly dynamic organizational environments. As one participant commented: *'a systems development project is not a deterministic exercise and from the outset you don't quite know what you are going to get. So you need to keep going back and sort of re-assessing and refining and re-defining how the organization is going to align with the system.'* This was seen as being a two way process; designing the organization and the system simultaneously, so that they can be tailored to each other. As one participant commented: *'you might consider an issue firstly in the feasibility study. You then have to keep going back not just to modify it in line with evolving changes to the design of the system but also to change the system to suit the requirements of the job.'*

4.3 The responsibility for treatment and the level of success

Whilst the importance of user involvement is widely recognised [26], the treatment of organisational issues may still not be a priority, because, in practice, IT specialists typically retain control the development process. However, the results of this study suggest that the responsibility for the treatment of organizational issues has often been delegated to the user community. For example, nine of the fourteen issues have been either fully or partially delegated to users and user managers in more than 50% of the responding organizations. Moreover, it can be seen from table 7 that when the responsibility for the treatment of organizational issues is delegated to the user community the average success scores are generally higher. Indeed, in one instance [user needs] the difference is statistically significant at the 1% level, whilst in a further two cases [IS strategy & assessment of current needs] the differences are significant at the 5% level. As the evidence in support of hypothesis **H3** was limited at the level of individual issues, the relationship between the overall proportion of issues treated by users and systems' effectiveness was also explored at the summary level.

Table 7: Frequency with which users are responsible for treating organizational issues and system's success

Organizational Issues	Users Involved	Average overall success scores			
		Users (Yes)	Users (No)	F Value	Significance
IS Strategy	41 (13%)	22.39	21.11	5.58	.019**
Prioritising	131 (44%)	21.66	20.96	3.46	.064
Future Needs	149 (49%)	21.74	21.02	3.8	.052
Current Needs	206 (62%)	21.47	20.60	5.3	.022**
Ergonomics	54 (44%)	22.62	21.84	0.1	.748
User Needs	169 (60%)	21.89	20.92	7.01	.009***
Working Style	91 (52%)	21.15	21.32	1.6	.208
Working Practices	183 (62%)	21.89	21.18	0.03	.871
Business processes	166 (54%)	21.41	21.13	0.57	.452
Structure	113 (73%)	21.45	21.74	0.23	.632
Culture	76 (59%)	22.03	21.02	2.53	.114
Power	44 (60%)	21.41	20.93	0.3	.586
Implementation	65 (22%)	21.88	21.22	2.01	.158
Disruption	144 (53%)	21.31	21.26	0.02	.961

Note: *** Significant at the 0.01 level; ** Significant at the 0.05 level

A 'number of issues treated by users' variable was calculated for each organization by counting the number of issues where the respondent ticked the 'yes' box. Each score was a number between 0-14, and the variable had an overall mean of 4.7 issues. The Pearson correlation of 0.15 indicated that there is a positive relationship between the number of issues that are treated by users and the overall success of systems development process, which is statistically significant at the 0.01 level [$r=0.15$, $p = .005$]. Once more the correlation analysis was repeated, controlling for the effects of organizational size and sector. The results of this analysis demonstrated that size and sector do not have a moderating effect on the relationship between the treatment of organizational issues and system's success as the correlation coefficient remains largely unaffected [$r=0.16$, $p = .002$]. These results provide reassurance that there is a significant relationship between the treatment of organizational issues and the resultant level of system's success, and based upon the statistical evidence hypothesis **H3** is supported.

The focus groups were asked to consider whether this statistical association could be interpreted as a direct causal relationship between user involvement in the treatment of organizational issues and the resultant level of systems' success. The respondents were not at all surprised by this result as they believed that users are far better placed to evaluate

organizational impacts and propose appropriate courses of organizational change; this, in turn increases the likelihood of systems success. As one participant noted: *'it seems like common sense to me, the user always knows the job better, because ultimately, they have got to do the job.'*

The justification for users taking a leading role was twofold: users' knowledge and user ownership. There was general agreement that users were likely to be more knowledgeable about the impact of systems within their own work domains. For example, it was suggested that: *'at the end of the day, if it's a finance module and you're putting it into a finance department, no matter how good the IT guy is, he is not going to know the financial implications of the system. A finance person is going to know it better.'* The process of treating organizational issues was also seen as an ideal mechanism for facilitating user ownership. This view was well summarised by another participant who noted: *'if you get somebody to take ownership of something they are going to be committed to making it work.'* However, one participant offered a word of warning about totally delegating the treatment of organizational issues: *'I think there has to be a balance between specialists and end-users - specialists may have to manage their [end users] expectations and keep their feet on the ground.'* To summarise, organizations should consider giving members of the user community more, but not necessarily total responsibility, for the treatment of organizational issues.

5 Concluding Remarks

The literature suggests that the treatment of organizational issues is generally inadequate; organizational are rarely treated as an integral part of the systems development process and, even where they are, it is typically by the wrong people or at the wrong time. Moreover, it is argued that inadequacies in the treatment of organizational issues are likely to exert a negative impact on the successful outcome of systems development projects. However, the nature of this relationship has remained unclear and so we set out to explore it empirically, using both a comprehensive survey and specialist focus groups.

Whilst every effort has been made to ensure that this study has been conducted in a thorough and systematic manner, like all forms of social inquiry, it suffers from a number of weaknesses. In particular, the adoption of the survey format restricts the range of issues and constructs that can be explored and there is the potential for response bias associated with the single-informant. However, we believe that the use of the focus groups to cross-validate the survey findings helps to reduce any potential sample bias and provides added reassurance that the results have a wider validity.

The most important contribution of this research is to shed new light on what is meant by the term *'inadequate treatment'*, in the context of organizational issues, and provide some insights into how the treatment can be made more appropriate. In particular, it has been clearly demonstrated that the outcomes of systems' development projects are more successful in those organizations that are now treating a wide range of organizational issues, treating them throughout the development process and ensuring that members of the user

community are actively involved.

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