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LIB 301

Essay: Opportunities and challenges for librarians and information professionals in the 4IR

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**Introduction**

The world is constantly changing. And with new technological advances made every day, in all fields and aspects, it seems the possibilities are endless. Yet change can be scary, and a fear of the unknown can be daunting. It is with this in mind, that this essay with look at the opportunities and challenges that face librarians and information professionals within the context and domain of the 4th Industrial Revolution (4IR). Libraries, librarians and information professionals have had to adapt to the ever-changing world they find themselves in. This change has spanned over centuries, enduring and evolving through three different industrial revolutions and currently at the pinnacle of the next (Hussain, 2019). The current on-going change in the world is sure to catapult librarianship, libraries and information professionals into the future and change how we use, manage and disperse our resources at hand. This essay will explore the good, the bad and the necessary in terms of librarians and information professionals and how they move forward. It will look at such aspects such as technology in libraries, the human component needed in running libraries as well as the current and future needs of patrons/ library users and as how librarians and information professionals to adapt to avoid becoming obsolete.

**Leading up to the 4th Industrial Revolution**

The term ‘Industrial Revolution’ has spanned across three centuries, dating back to the first industrial revolution in the late 18th century (Fredrick, 2016). All four industrial revolutions have brought about change and how we see and operate within the world around us. We have gradually, over time, evolved into the world we know today. From humble beginnings of craftsmen creating goods and products within small-scale home based industries, to considerably larger scales of manufacturing and production in large scale factories and industries. These large scale industries saw the need for the invention of machine that could reproduce the same products craftsmen were doing, but in a much more fast and effective manner (Fredrick, 2016). This expanded quickly, and soon trickled into what was known as second industrial revolution, which gave way to the use of steam powered machines to more oil and electrical-based machines used in various industries as well as the introduction other technological advances such as “electrical communications” i.e. telegraphs, in the mid 19th century (Fredrick, 2016). And it was this shift to electrical communication that saw the immergence of telecommunication and the third industrial revolution better known as the digital age, with the shift made to digital formats. By the mid to late 20th century the digital age came into full effect with greater technological advances taking place at a faster rate than ever before, with the realization of the need for better information technology, communication and energy-based change (Fredrick, 2016).

Furthermore, every revolution and time period within relatively recent history has brought us to the point we are at today, the inevitable emergence of the 4th industrial revolution. The 4IR aims to impact a vast array of facets in the world, that being: industry, government and politics, healthcare, academia and universities, media and telecommunications and libraries alike, to only mention a few. The 4th Industrial Revolution has and will further see the incorporation of artificial intelligence, virtual realities, robotics, Internet of things and automation processes into almost every industry and disciplines (Ayinde & Kirkwood, 2020). This can be seen in how we communicate, shop, work and what we value (Hussain, 2019). And although the third industrial revolution can be accredited for the expansive technological and digital inventions we have today, it will be the 4th industrial revolution that will take us to the next level. The 4th industrial revolution moves to merge and converge: digital, physical and biological innovations through the use of Cyber Physical Systems (van der Walt, 2019).

**Opportunities for librarians and information professionals in the 4IR**

Librarians and information professionals have played vital role in society since the 8th century to present, and have always been involved in aiding the public in gathering, organizing and using resources the library and information centers has to offer. And although their roles have in certain areas has grown and developed, whilst in other areas they have been outmoded and/or superseded, yet there are still great opportunities for the profession to grow and develop with the 4th Industrial Revolution if they choose to embrace the changes and make use of and incorporate the innovations the revolution brings with it by bringing together and creating a symbiotic relationship between the human and the smart technology of the 4IR (Ayinde & Kirkwood, 2020).

The 4th Industrial Revolution brings forth innovations librarians and information professionals can utilize such as artificial intelligence, expert systems, the Internet of Things, drones and block chains (Ayinde & Kirkwood, 2020), that can be used as tools and assistants which can help enhance and increase individuals efficiency and competitiveness within their respective fields. The use of drones is one example of how information centers such as libraries and by librarians can create interactive and exciting ways of engaging with patrons, young and old, but especially the youth in that they are not only able to witness firsthand the innovations of the 4IR but also be able to learn the operation of the innovation and captivate their minds in ways they did not know were possible. Librarians and information professionals would now have the ability to disseminate and distribute information in a completely new way that would also drastically cut down the time needed to travel and browse information centers and retrieve the information resource needed (Ayinde & Kirkwood, 2020). And in terms of the current state of healthcare and the pandemic the world finds itself in, the contactless motion of using drones could save lives too.

Another example of how innovations connected to the 4IR pose a superb opportunity for librarians and information professionals is the use of Artificial Intelligence (AI) within their day to day duties. Artificial intelligence are programmable computers that are capable of doing librarians daily task that require a certain level of intelligence such as determining levels of issues and problems, problem solving and reasoning, and although at the surface, this may seem to be doing the job of the librarian and taking away from their duties, it in actual fact opens them up to utilize their skills in a more meaningful way by allowing them to focus of the more robust and complex issues that may need their attention such as task that need social intelligence and novel and adaptive thinking (Ayinde & Kirkwood, 2020).

 Libraries and information centers can use the 4IR as a form of social and economic growth as well (Zervoudi, 2020). Socially, they can entice and persuade their users to use their facilities instead of going somewhere else or just doing a quick search on the internet, whilst at the same time the incorporation of the 4IR would entice sponsors and funders to invest in their facilities further because of how in-tune and in touch they are with the present and future, which would further help the economic growth of their facilities because of the higher demand they would have in terms of patron usage and interest.

**Challenges for librarians and information professionals in the 4IR**

The emergence of the 4th Industrial Revolution has clearly shown why there are great opportunities for librarians and information professionals, however, on the flipside of that, is that there are also very notable and obvious challenges that may arise in the library sector as a result of the 4IR. And it is in this context where the quote by HG Wells (1945) seems most applicable, “Adapt or perish…” as to mean that if libraries choose to remain the same, stagnant and unwilling to embrace the changes that the 4IR brings, they stand a very good chance of becoming irrelevant, obsolete and old-fashioned.

The first challenge then comes in the form of having to learn, relearn and unlearn certain aspects that were previously seen as vital knowledge for librarians and information professionals to know such as organisation and data management and storage (Ayinde & Kirkwood, 2020). As there are certain duties that are no longer needed from librarians and information professionals but there are also certain new duties that will replace the old ones in order to operate and function in the 4IR. And it is within this context that it has to be said librarians and information professionals not only need to work with the new innovations of the 4IR but also have to understand the nuances and have the proper skill set to ensure that they use the technologies efficiently and effectively in order to best reach organizational goals (Ayinde & Kirkwood, 2020).

Furthermore, from a social aspect, the 4IR runs the risk of furthering the economical divide between the have and the have-nots (Zervoudi, 2020). This can be seen in our country and across the world as those who are already find themselves in a position of financial privilege are able to make substantial moves to ensure they move swiftly along with the innovations introduced in the 4IR, whilst the more underfunded and under privileged facilities may be left behind and in the dark which can result in an increase of unemployment and furthering the already income gap between the privileged and those whom are not (Zervoudi, 2020). Another socioeconomic aspect that could affect the library and information sector is the fact that the training and retraining of staff to be equipped with the necessary skills to function in the 4IR will cost money, and government and private sectors alike to would to invest in training and education of their employees or risk being left behind. The biggest risk also comes into play with the potential loss of millions of jobs of low-skilled workers whose position can be completely replaced by the 4IR and its artificial intelligence and automation process if the correct government policies are not put in place. And the culmination of vast unemployment and under skilled workers with the context of 4IR will ultimately result in a global increase of poverty, but especially in developing countries (Zervoudi, 2020).

**The way forward**

According to Ahmat and Hanipah (2018) libraries and librarians facilitate a knowledgeable, conversant and participative society. Thus it will be librarians that society will turn to, to help inform and educate society about the new ways and innovations of the 4IR, as they are seen as trustworthy information brokers. And it will them be the librarians duty and responsibility to fulfill this duty by ensuring that the librarians themselves are well conversed in the new ways of operating in the 4IR in all forms and formats, be it new media, fast changing innovations and/or providing access to information known and unknown. They also note that libraries and information centers will be the advocates and facilitators of the 4th Industrial revolution.

And although there might currently be a shortage in skills to function in the 4th industrial revolution, leaders and the relevant people in power are fully away of the fast changing times and are taking constructive measures to enhance and create well-rounded librarians that can make the transition into the 4th industrial revolution and easier and unproblematic for all its users and society as a whole (Rotatori, Lee & Sleeva , 2021).

Librarians and information professionals are at the forefront of leading society and smoothly transitioning into the 4th industrial revolution and therefore need to proactively engage with the here and now, and everything happening around us, ensuring that are and remain up-to-date with the new technological advances made every day for their livelihood as well as for the betterment of their users and patrons.

**Conclusion**

This essay has looked at how the world has transitioned over the last couple of centuries from the first industrial revolution focused on mechanical production in the 18th century, followed by the second industrial revolution which saw the change to electrical-based machine and urbanization, the third industrial revolution and the digital age, and then the current fourth Industrial revolution and the introduction to AI and other smart technological innovations. And continuously trough all these time periods and changes, librarians and information professionals have been a constant feature, adapting and changing with the time to ensure their relevance and necessity. And this essay has shown that this time is no different, and if they do not, they risk becoming obsolete to society and their needs. And as time has shown us over and over again is that the only constant thing in life is change, and it needs to be embraced in order to progressively move forward.

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