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Opinion Paper

Information management research and practice in the post-COVID-19 world

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ABSTRACT

COVID-19 has radically transformed many aspects of human life and global society both now and for many years to come. A key aspect of the transformation has been increased digitalization and the accelerated implementation of previously predicted trends that have been discussed for many years in the information management literature. Human endeavour has encouraged us to adapt to the “new normal” through immediate necessity in areas such as work, education, healthcare, entertainment and leisure, and online commerce. This new environment has provided unprecedented opportunities for the information management research community to develop research that will have a significant impact on practice in these and other areas. We are essentially at the pinnacle of new developments in the digital space and must seek to develop exemplars that can help to signpost the future direction of digital global society for the benefit of all. Notwithstanding, the problems of digitalization have also been exacerbated and must be further understood and ameliorated in the post-COVID world. This paper examines opportunities and problems in information management brought about by the COVID-19 pandemic. It details implications for research and practice.

1. Introduction

A burning question in the information management community is whether and how COVID-19 will change what we do as researchers and educators. The reality is that it already has, and will continue to do so, probably indefinitely. Many journals are launching “special” issues on COVID-19. However, this could be seen as ironic, since from a research perspective, all research that we do from now on will in some way be touched by the COVID-19 pandemic. The impact of the pandemic has been so global and wide-reaching that it defines human endeavour from this point forward. It will be a yardstick against which our academic discipline will be judged: how much has information management research benefitted global society in the post-pandemic era?

This global pandemic is very different to those of the past, such as Spanish Flu after the First World War. Now, as the global economy begins to contract after the effects of the unprecedented global lockdown and we adapt to the “new normal,” information management research stands at the vanguard of the radically digitalized world with the potential to shape our future direction for the better. Research grants calls begin to demand that research has a clear and measurable impact in the post-COVID world. Doing so will require radical thinking, a multidisciplinary perspective, and doing more with less, e.g. frugal innovation (Radjou & Prabhu, 2015).

In some ways, COVID-19 has brought us closer together, for example as huge numbers of employees have sought to rapidly change

work practices and conduct meetings remotely for the first time, or as parents of younger children have taken a leading role in home-schooling. However, in others, it has pushed us further apart, for example as older citizens without the Internet have felt the impact of the digital divide, shutting them out of digital communication, online shopping, and opportunities to improve mental health, whilst high-school aged children from poor communities have been shut out of online education, potentially affecting their future economic opportunities.

For better or for worse, the COVID-19 pandemic has brought information and communications technologies to the forefront of human life. It has rapidly accelerated long-time predicted trends in work and education such as the “university of the future” (Etzkowitz, Webster, Gebhardt, & Terra, 2000; Marshall, 2018) and the “officeless firm” (Lai & Burchell, 2008). However, it has also amplified well-known problems, such as the “digital divide,” problematic internet use, and market failures, e.g. “price gouging” from sellers on Amazon selling essential goods such as hand sanitizer. From an information management research perspective, the COVID-19 pandemic provides extraordinary opportunities for our discipline to lead the way and to become an exemplar of how the work of academics can create lasting value and benefit throughout many aspects of human endeavour. In this short paper, I would like to highlight a number of key areas of research and practice that have been particularly affected by COVID-19, and to outline some areas of future research that provide significant

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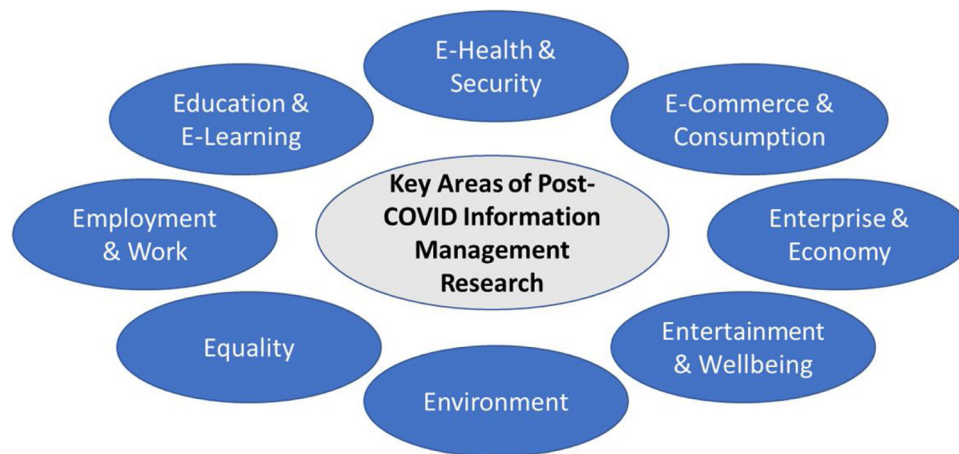


Fig. 1. The 8Es of Post-COVID-19 Information Management Research.

opportunities for creating fruitful, impactful future research.

2. Implications for research

Information management has the opportunity to lead and contribute to impactful post-COVID-19 research in many areas. Fig. 1 summarizes eight non-mutually exclusive areas of research (8Es) that provide some of the most fruitful opportunities: employment and work, education and e-learning, e-health and security, e-commerce and consumption, enterprise and economy, entertainment and wellbeing, environment, and equality. Let us examine briefly just a few key questions to be answered in some of these areas.

2.1. How can we co-ordinate and share data across borders to create a safer world?

The coronavirus pandemic has demonstrated extreme contrasts in the approaches and success of countries in reducing the spread of the disease. Countries such as China and South Korea, and more recently New Zealand, have demonstrated that rapid response and coordinated effort to control borders, ensure lockdown, test and trace individuals are key. Information management research has a key role to play in developing future frameworks and applications to help control, monitor and trace individuals carrying viruses, e.g. using internet of things (IoT) sensors and mobile devices. Future work must go beyond national borders; further effort is needed in global co-ordination and data sharing between countries to enable effective tracking and tracing, e.g., travel and “air bridges.” Clearly, this has implications for individual privacy, ethics, and civil liberties. However, technologies such as blockchain can provide facilitating roles through secure wallets and immutable ledgers that allow individuals to control information shared with stakeholders while allowing frictionless communication and transactions (Rahman, Hossain et al., 2019). Further, the introduction of 5 G technologies enables data sharing in much more complex information ecosystems, such as those involved with managing large crowds of people (Patwary et al., 2020). Information management research can contribute significantly to the development of models, frameworks, policy and applications to create a safer post-COVID-19 world.

2.2. How can we build supply chains that are more resilient to pandemics?

Consumer behaviour in response to the pandemic has provided significant and unforeseen challenges to businesses. At the beginning of the coronavirus pandemic, relatively small changes in the purchase of essential household goods, e.g. toilet roll and hand sanitizer, and basic foods, e.g. dried pasta and baked beans, created havoc in the modern

just-in-time supply chains of supermarkets. Such supply chains have been engineered with the utmost of efficiency in mind and the unpredicted increases in demand coupled with a lack of a supply buffer left empty shelves in stores. The reasons for this are quite different to those of typical natural disasters and are not well understood. They can potentially be explained using compensatory control theory (CCT), whereby uncertainty and associated anxiety reduces perceived control (Chen, Lee, & Yap, 2017). According to CCT, consumers with lower control will seek to gain control by purchasing utilitarian products (which is perceived as a “solution” to the “problem” and uncertainty). Thus, as a result, many standard household goods became rapidly sold out in stores, whilst the sight of empty shelves reinforced a feeling of panic, further contributing to the problem. Many consumers turned to online only to find that high demand and lack of capacity and flexibility of meant high waiting times or unavailability for home delivery. More research is needed to help build understanding of consumer behaviour and supply chain systems that are more flexible and resilient to pandemics.

2.3. How will technology change employment, work practices and industry after COVID-19?

For many years, academic researchers have studied teleworking (Daniels, Lamond, & Standen, 2002), including extolling its benefits for productivity, including reduction of distractions, increased satisfaction, reduced stress, and better performance (Baruch, 2000). However, teleworking is also understood to have potential negative effects on mental health and emotions, including loneliness, worry and guilt (Mann & Holdworth, 2003). For better or worse, COVID-19 has rapidly propelled many types of industries that have been able to continue operating to work remotely without offices using platforms such as Microsoft Teams and Zoom. Many employees and organizations have embarked on such work practices at scale for the first time. A key challenge for these organizations has been maintaining organizational culture in remote environments. While technology has been a greater leveller in many ways, it has also discriminated in the industry and socio-economic landscape. The ability of certain industries and organizations to adopt “homeworking” technologies has been driven by such factors as accessibility of technologies, existing use of services, and availability of skills; industries such as information and communication, finance and education have been found to be high users of homeworking, while accommodation and food services, transport and storage and retail have little usage (Office for National Statistics, 2020). This underlines existing research that finds that workers in some occupations, and with higher income and education levels, benefit relatively more from internet use (Castellaccia & Viñas-Bardolet, 2019). A key issue is the extent to which new technology-enabled work practices

will become embedded or will continue to change after the pandemic, e.g. will such things as commuting become less commonplace, reducing the need for expensive real estate? Pollution levels have fallen as industry and travel have been curtailed during lockdown (CO₂ levels are estimated to fall by 4–8 % during 2020; [Carbon Brief, 2020](#)) – is this temporary or will government measures be put in place to green our future way of life and help save the planet ([Helm, 2020](#))? Moreover, what are the implications for the future structure of the economy and industry – for example, in terms of the emphasis on knowledge work versus other work? How will knowledge and other industries need to innovate through technology to survive, e.g. using frugal innovation ([Radjou & Prabhu, 2015](#))?

2.4. How can we use technology to serve the health needs of all in society in a cost-efficient way?

Another key area of e-health in need of further research is the development and implementation of cost-effective telemedicine on massive scale. Medical practitioners have been key frontline staff in the fight against COVID-19, and these brave workers have been the most at risk of losing their lives. The imposition of lockdown has created a huge backlog of operations and healthcare interactions for national health systems. Going forward, more efficient methods and process re-engineering of the traditional healthcare model is needed to allow general practitioners and consultants to operate at scale to control the flow of future healthcare traffic and cope with geographically dispersed citizens. Even COVID-19 can be remotely diagnosed ([Greenhalgh & Koh, 2020](#)). Telemedicine is far from new ([Wootton, 2001](#)), but until now, many governments such as the UK have kept telemedicine at arm's length for mainstream healthcare delivery. Part of the problem in developed countries is coping with the healthcare needs of an aging and vulnerable population. In developing countries, a key challenge is to make healthcare available and affordable for all. Future healthcare needs and the new digital outlook provide an unprecedented platform for change. Moreover, robots, sensors, artificial intelligence, blockchain and broadband networks provide components for comprehensive personal healthcare monitoring and management of more vulnerable patients remotely in the home environment ([Rahman, Rashid et al., 2019](#)). How can information management researchers contribute towards developing cost-effective models, frameworks, policy, and applications for delivering high-quality, sustainable, and personalised healthcare in the austere post-COVID-19 world?

2.5. How will technology change higher education in the post-COVID-19 world?

For decades, schools and universities have gradually implemented various types of learning management systems and educational technologies, such as Blackboard and Moodle. Free massive open online courses (MOOC) offered using distance technologies have also helped to introduce digital education platforms to the world (although they appear to have become less popular in recent years). Dedicated distance education providers, such as Pearson and the Open University are equipped with the knowledge, skills and technology to provide very high-quality distance education. However, like other organizations, all universities have been immediately propelled into providing distance education to maintain service delivery during lockdown, often without the knowledge, skills or infrastructure to do so effectively. The “university of the future” has been discussed for many years as one that is based on state-of-the-art educational technology and that is fully integrated with the triple-helix (academic-industry-government) ([Etkowitz et al., 2000](#); [Marshall, 2018](#)). Will such a vision become a reality for most universities as they struggle to deliver attractive programmes, obtain funding and survive in the competitive post-COVID-19 world? In the UK, the Government have announced that fees for undergraduate degrees will remain the same: can universities deliver

degree programmes for equivalent value through an online platform? Many universities have announced that lectures will be online next year, typically integrating with interactive exercises and online discussions. Some universities are offering socially distanced seminars in a blended learning offering, while large-scale social events, discussions and interactions such as Freshers' Weeks and inductions that are the epitome of the university experience will be online. There is debate and much uncertainty as to whether online offerings implemented by universities in the next year will be able to attract students in the required numbers and to what extent they will perpetuate.

2.6. How will technology change the way that we purchase and consume post-COVID-19?

During lockdown, online shopping has grown to mammoth proportions, as new and existing online consumers have sought to obtain products via available means. [ACI Worldwide \(2020\)](#) reported that global e-commerce sales grew by 207 % in April alone. Many countries now have extremely large bases experienced online consumers. Meanwhile, numerous businesses have moved online to main a revenue stream, while existing online businesses such as Amazon, hardware stores and online supermarkets have thrived. Some market failures have been apparent, for example as price gouging occurred when businesses on platforms began selling items such as hand sanitizers and face masks for huge multiples of their retail price. In a socially distanced post-pandemic world, technology is likely to continue to play an increasing role in the way that we consume. One question for information management researchers is how online consumer behaviour has experienced a lasting change through the COVID-19 lockdown. Will consumers prefer digital over physical in the future? Early lessons from China suggest that the pandemic has accelerated e-commerce trends post-lockdown ([Stewart, 2020](#)). The post-COVID-19 consumer may also be more accepting of further technological innovation in the delivery of consumption experiences. Technologies such as virtual reality provide a means for creating enhanced forms of experience interaction and memorable customer engagement, driving sales, and potentially playing a role in many aspects of customer interactions ([Barnes, 2016](#)) and the value chain ([De Regt, Barnes, & Plangger, in press](#)).

2.7. How can technology be used more effectively to create equality and improve wellbeing?

The accelerated move to digitalization during lockdown is a double-edged sword. While it has provided many significant benefits, such as those aforementioned, it has surfaced old wounds that are all too familiar in information management research. This include the “digital divide,” whereby certain demographic groups are technologically disadvantaged in some way, for example through lack of access, bandwidth and/or skills ([Hilbert, 2013](#)). Vulnerable groups typically include low income households, those with lower educational attainment, the elderly, disabled, and may disproportionately affect certain ethnic groups. Given that black communities and older citizens are known to be more at risk from coronavirus mortality, this is of particular importance for future research. For example, [Beaunoyer, Dupéré, and Guitton \(2020\)](#) explain some of the key digital inequalities (technical, autonomy of use, social support networks, and experience) brought about by COVID-19, including the vulnerabilities arising from these, and key mitigation strategies to improve individuals' technology use and targeting of messages. Technology can help considerable in improving wellbeing both now and in the future ([Torous, Jän Myrick, Rausedo-Ricupero, & Firth, 2020](#)). For some, technology has been a means to increase wellbeing during lockdown, through entertainment, online exercise classes, social contact, and so on. Online streaming video services have surged in popularity. However, for others the increased use of technology during lockdown has exacerbated deleterious effects such as loneliness, mental health, addiction and problematic

internet use (Barnes, Pressey, & Scornavacca, 2019; King, Delfabbro, Billieux, & Potenza, 2020). Information management researchers can help by contributing further to our growing understanding of the problems from overuse of technology and through research into effective new technologies for managing problematic technology use and improving wellbeing.

3. Implications for practice

In the post-COVID-19 world, the information management community finds itself with unprecedented opportunity to develop research that will have a significant impact on practice in the abovementioned areas. Academic research in many countries is increasingly becoming formally assessed by national government bodies for funding distribution in terms of such metrics as “knowledge transfer”, “industry engagement” and “impact on practice” (e.g., in the UK, “impact case studies” are worth 25 % of the national assessment for the Research Excellence Framework). The above research topics are particularly focused on applied rather than basic research; information management researchers have the opportunity to play a leading role in developing practical impact and obtaining future research funding in the austere research environment of the near future. We are essentially at the centre of new developments in the digital space and must seek not only to develop innovative research that can help to signpost the future direction of digital global society for the benefit of all, but to work together with practitioners to co-create research and ensure that ideas are properly implemented and their impact assessed.

4. Conclusions

This paper has highlighted a number of important avenues for future information management research and practice. It is hoped that this agenda for future research may, in some small way, contribute to encouraging other researchers to embark upon research projects in some of these important areas that will serve as exemplars for our profession and that may develop lasting benefits for global society in the post-COVID-19 world.

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