The Search for Smartness in Working, Living and Organising: Beyond the 'Technomagic'

Editorial for Special Issue of Information Systems Frontiers

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1 Introduction

The significant advancement in the fields of electronics and computer science has produced innovation in devices and systems. For example, the miniaturisation of electronic components and devices combined with the evolution of wireless distributed networks have significantly enabled mobility and the connectivity of devices. Also, advances in sensor technologies have allowed ubiquitous objects to measure performance and transmit information regarding their functional state and their operating environment in a more reliable and low-cost way. These technologies enabled the development of mobile devices and wearable electronics. In addition, Web 2.0, fast-speed computing and efficient data storage have facilitated the emergence of new generation of data analytics and machine learning. Taken together, these plethora of new advanced technologies offer numerous possibilities and pitfalls for users. It is argued that they will change our world and whatever we do at work, home, leisure and even during times of crisis (Elbanna et al. 2019; Hughes et al. 2019;

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Ismagilova et al. 2019a, b; Kim et al. 2016; Papagiannidis and Marikyan 2019; Rana et al. 2019; Bunker et al. 2019b; Stieglitz et al. 2018). One of the changes receiving currency is the capability of these technologies to be 'smart' and to make us 'smart'. While the the term 'smart' is used vaguely by management and in the corridors of policy makers, computer scientists typically associate it with the use of the internet, connected devices, embedded sensors and machine learning. In this special issue, we widen the definition of 'smart' from a narrow technically oriented view to a wider transformatory sociotechnical view that puts use, impact and outcomes at the heart of achieving smartness in working, living and organising. Smart here is defined as 'the intelligent and rational use of resources to work, organise and live efficiently and effectively, healthily and happily, to the benefits of individuals, society, humankind and planet earth'.

We initiated this special issue with a simple question; do we live smarter with new classes of technology and if so, how? We were seeking to find aspects of smartness in our contemporary working, living and organising and to progress our understanding of the vast array of new technologies that are being adopted everyday by individuals, organisations, industries and society. We aimed to advance our understanding of the human aspects of living and organising with these technologies. Therefore, we called for research from different contexts and facets of life to understand the adoption and organising principles of emerging smart devices and technologies in smart homes, smart cars, smart phones, smart government, smart cities and smart organisations. We asked critical questions such as *who is becoming smart and what are they becoming smart about? Who are the "winners and losers" and what role does technology play? How are emerging technologies adopted and appropriated in everyday life and what impact are they having?*

Our focus was to broaden the theoretical base of adoption and diffusion of technology in light of these new technologies and new challenges. We welcomed papers that focused on traditional diffusion of innovation theories (for example,

Davis 1989, Dwivedi et al. 2019a; Rogers 2003; Venkatesh et al. 2003) and strongly encouraged critical thinking and development and utilisation of new, non-traditional and context-specific conceptual lenses and viewpoints. We welcomed papers that focused on technology at home, in the workplace and as they apply to the delivery of public services. Our hope was to move forward in our understanding of different types of adoption and implementation contexts which include organisations, industries and society (Dwivedi et al. 2015; Bunker et al. 2019a; Bunker et al. 2015). We encouraged scholars to examine different types of organisations and sectors including those that have traditionally been less represented in IS research. For example, not-for-profit and voluntary sector organisations, building and construction, automotive, transportation and infrastructure as well as the energy sector are all industries where the adoption of technology has had critical impact yet receive little research attention.

2 Smart: A Complex Achievement of Technology, Users and Organisations

The current rhetoric of smartness in business and society presents strong belief in (and sometimes fear) of the enormous power of technology to 'revolutionise' our world and 'make' us achieve maximum use of resources in the most rational ways. It brings about strong technological determinism where the existence of technological systems and devices is believed to unquestionably provide straightforward positive and revolutionary effect. Wastell (2011) argues that this infatuation with the potency of technology reflects a form of magical thinking, which he designates 'Technomagic'.

In this regard, the existence of smart tools such as data analytics systems, machine learning technology, geographical tagging technology, advanced data science and algorithmic development, mobile devices, social media platforms and tracking systems is believed to directly lead to intelligent ways of living, working and organising (Akter et al. 2019; de Camargo Fiorini et al. 2018; Duan et al. 2019; Dwivedi et al. 2019b; Gupta et al. 2018; Sivarajah et al. 2017; Bunker and Sleigh 2018; Ehnis and Bunker 2019). The market rhetoric for many of these technologies revolves around improving predictability, achieving precision of business models and bringing about fast decisions and agile operations with high accuracy. This rhetoric assumes the existence of a 'neutral context' where technology moves freely as it were in a contextual vacuum to produce expected results. It ignores users, the context of use, the quality of data, the nature of the market and competition and also the context of design (Wastell and Cooper 1996; McMaster and Wastell 2005; Elbanna 2008; Elbanna and Linderoth 2015; Kaniadakis and Elbanna 2019). Indeed, under the assumption of an absence of environmental factors that could influence the design and

operation of technology, technical systems could provide this expected smartness. In this assumed neutral context, machines 'rule' our world enforcing unprecedented objectivity, efficiency, effectiveness and organising capability while providing real-time processing and visualisation, individual profiling of users and individualised services, following users wherever and whenever they are, geographically tagging users and profiling them and providing cheap computing following a utility model. Table 1 presents some of the characteristics and functions of technological smartness that are believed to be transmitted from the technological domain to the social domain in a neutral environment.

However, technology studies and information systems research have, for many years, stressed the importance of the environment in moderating the impact of technology and producing unintended consequences. Indeed, research has highlighted that users, their context of use, corporate policies, organisational structure, power dynamics and design context play key roles on what and how technology impacts individuals, organisations and society (Wastell 1999; Bunker 2001; Wastell 2003; Wastell et al. 2004; Bunker et al. 2008). Studies have also highlighted that technology design is subject to many environmental factors including; designers' cultural background and experience, dominating logic; available organisational resources including the type and support of template development approaches and methods; presence or absence of participative design approaches; and perception and management of development project risk (Dang et al. 2019; Kautz et al. 2011; Kautz 2011; Pries-Heje et al. 2008; Bunker et al. 2007).

3 The Special Issue

The papers presented in this special issue have been discussed at IFIP 8.6 conference in Portsmouth UK in June 2018, were selected for further rigorous review and where seven papers were finally selected for publications in this special issue. An argument that cuts consistently across these papers is that despite the magic of emerging technology, outcomes are dependent on the formation of sociotechnical systems that could carry technology through successful adoption, efficient and effective use. The papers in this special issue show that 'smartness' is a product of a long journey and not a direct outcome from the adoption of the technology itself.

The first paper is by Peter Bednar and Christine Welch entitled "Sociotechnical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems" (Bednar and Welch 2020). In this paper, authors adopt an individual perspective of smart working reviewing the debate on industry 4.0 and the emerging industry 5.0 and associated technologies. They explore the nature and implications of smart working and sustainability. Bednar and Welch (2020)

Table 1 Characteristics of smart technology in a neutral context

Characteristics	Function
Real-time information provision.	Provides real-time analysis and visualisation of data to users.
Individuality of goods and service provision.	Provides profiling of users allowing organisations to create individualised goods and services.
Mobility of data, information and service access.	Follows users anywhere anytime.
Geographical localisation.	Locates users and pushes services and goods to them.
Invisibility.	Connects users to each other providing seamless data transfer and processing
Hyper connectivity where devices are continuously connected to each other and to their users.	Devices transmit and signal information to users who take decision in a dynamic and rapid way.

pose and answer important questions regarding from whose point of view smartness is being considered, whether smart system promote sustainable organizations and how design of smart systems should be approached to produce sustainable positive impacts. They adopt a humanistic perspective that is rarely considered in IS research (Sarker et al. 2019). They suggest that we go beyond the fascination of the new and emerging technology and critically argue for the use of contemporary sociotechnical system design where the whole working system is examined and considered rather than only the narrow adoption or use of technology. This includes work design, policies, reward systems and holistic evaluation systems that takes into account individuals, occupational roles, job design, technologies and the organization (Bednar and Welch 2020).

The second paper by Olivia Benfeldt and colleagues is entitled "Data governance as a collective action problem". In this paper, Benfeldt et al. (2020) highlight that the much-celebrated data analytics systems cannot succeed without good data governance. However, they argue, data governance remains elusive and difficult to achieve in practice. They adopt an engaged scholarship approach to investigate the challenges practitioners face in their adoption of data governance in local government. They discover complex intricate challenges that prevent the adoption and implementation of data governance. These include value, politics and collaboration. They conclude that to be viable in practice, data governance requires a collective action beyond the thinking of a single system or technology (Benfeldt et al. 2020).

The third paper by Prabhsimran Singh and colleagues is entitled "Smart Monitoring and Controlling of Government Policies Using Social Media and Cloud Computing". Here the authors argue that government can get smarter through improving the ways it engages and responds to the public. They adopt a pragmatic approach to enquiry and combine the capabilities of both cloud computing and social media analytics to develop a low-cost system for the monitoring of public reactions to governmental policies, options for improvements and the developing of future policies. They

propose a system and apply it to monitor public reaction in India, to a latest government policy implementation of the Good and Services Tax by Indian government. As described within this paper, the system has achieved encouraging results which could have an impact on efficient policy making (Singh et al. 2020).

The fourth paper by Milad Mirbabaie and colleagues is entitled "Who Sets the Tone? Determining the Impact of Convergence Behaviour Archetypes in Social Media Crisis Communication". In this paper, authors examine the use of Twitter in emergency situations and examine the case study of Manchester Bombing 2017. They adopt both manual content analysis and social network analysis to study convergence behaviour in this incident and develop a number of convergence archetypes for Twitter use in crisis situations. They provide a critical perspective for the use of Twitter in crisis situations highlighting its positive and negative potentials and how both can become amplified when informing the public during a crisis while also causing tensions and threatening social cohesion if not carefully managed (Mirbabaie et al. 2020).

The fifth paper by Bendik Bygstad and colleagues is entitled "Developing and Organizing an Analytics Capability for Patient Flow in a General Hospital". The study examines what it means to develop an analytic capability in healthcare and in particular hospitals. They argue that analytic capability cannot be taken for granted as a result of adopting analytics technology since it includes not only the ability to gather and analyse data but also the extensive use of data with the aim of driving decisions and actions. They adopt an information infrastructure perspective to examine a case study of a new high-tech hospital and show the complexity surrounding the adoption of analytics. They find that analytic processes interact with the hospital logistics processes in a 'sense and respond' way. In addition, the case study reveals that the development of analytics capability goes well beyond the adoption of data analytics technology to the development of analytics teams and the will of administrative and

clinical decision makers to alter and formulate decisions based on data analytics (Bygstad et al. 2020).

The sixth paper by Khalid Alzadjali and Amany Elbanna is entitled "Smart Institutional Intervention in the Adoption of Digital Infrastructure: The Case of Government Cloud Computing in Oman". The authors adopt an interpretive approach to enquiry to examine the adoption of government cloud computing in Oman and how institutions could possibly intervene to facilitate this adoption. They reveal the institutional forces that influenced this large-scale adoption and their findings surprisingly show that the market rhetoric of efficiency was not as influential in driving the adoption as the mimetic forces (Alzadjali and Elbanna 2020).

The seventh paper by Steven Alter is entitled "Making Sense of Smartness in the Context of Smart Devices and Smart Systems". In this paper, Alter (2020) provides a conceptualization of smartness in relation to purposefully constructed entities including devices and automated systems. The study focuses on the technical capabilities of systems and devices and the principles of smartness in this regard. In this study, Alter (2019) develops a matrix for smart capabilities that allows for rating the level of smart capability in devices and systems. This matrix could inform analysis and design allowing to locate the level of smartness a device and system could technically provide.

4 Future Research

This special issue shows the range of research approaches and theoretical underpinnings that could be adopted when examining the impact of technology on working, living and organising. It asserts a constructionist perspective of technology adoption and use that grounds technology determinism claims in the context of adoption and use and shows the influence of the social, organisational and incumbent technology on adoption outcomes.

Future research on new technology could go beyond the rhetoric of technology domination to examine Whose values? Whose ethics? And whose point of view? What functions, features and 'worldview' are embedded in the technology and how these are being adopted -or ignored- in practice (Elbanna 2007). In this regard, future research should go beyond the existence of smart devices and technology to examine how smart users, organisations and policies could come about through the use of these technologies. The trinity of big data, analytics and artificial intelligence (Akter et al. 2019; de Camargo Fiorini et al. 2018; Duan et al. 2019; Dwivedi et al. 2019b; Gupta et al. 2018; Sivarajah et al. 2017) should be put under scrutiny beyond the technology deterministic view of their power to make our world more efficient and effective.

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