An introduction to digital welfare a way forward?

Citation for the original published paper (version of record):
Larsson, A., Teigland, R. (2019). An introduction to digital welfare a way forward?. Digital Transformation and Public Services: Societal Impacts in Sweden and Beyond: 1-11.
http://dx.doi.org/10.4324/9780429319297-1

1 An introduction to digital welfare

A way forward?

Anthony Larsson and Robin Teigland

1 Introduction

Increased "availability" and "individualization" are two of the most common demands from consumers in this day and age. This is a development that has gained a substantial foothold on the contemporary consumer market, whether the services lie in finance, insurance, retail, and/or transportation. The Internet, smartphones, and other technologies sprung from the digital age have helped people gain better insight into and awareness of what they expect from a service provider (Hardey, Loader and Keeble, 2009). To this extent, the welfare sector, just like other industries, also benefits from new technologies and digital innovations, as it seeks to drastically improve our everyday lives and help us create more sustainable societies.

It should at this point be noted that the welfare state as, we know it, has existed for approximately 100–150 years. While one may contend that the first welfare state was presented by the Islamic Caliphate under Umar (584–644), it did not exist in its modern concept until the late 19th-century Imperial Germany (1871–1918) under Chancellor Otto von Bismarck (1815–1898), when he established the social-welfare legislation that extended the privileges of some of the noble social classes to common Germans (Crone, 2005; Von Kersbergen and Vis, 2014). Still, the welfare sector is nowadays commonplace in most Western societies (albeit to varying degrees). However, digital solutions are often arduous to scale for the welfare sector. This is because the manner in which the welfare state is organized leads to various incentive structures that may hinder digital development. Traditionally, the incentive structure has been such that "the lower the benefit levels are in the compulsory systems, the stronger the incentives for citizens to add voluntary (market) solutions, in the form of private saving and private (individual or collective) insurance arrangements" (Lindbeck, 1996, p. 1). To this extent, the rapid development of digital technology poses a challenge to several of the extant structures, providing citizens with new options in areas where they see a need for something that is currently not provided for by the state. In return, new actors entering the welfare sector have prompted a counter-response from the state actors, in some cases coaxing these actors to expedite their digital evolvement in order to safeguard their market share against the new actors. This book

will endeavor to explore the development in different welfare areas as outlined later in this introductory chapter.

Digital technology consists of many different concepts and components. As previously mentioned, the Internet has in many ways provided the backbone to much of this development, providing people with information access and flexibility in ways that were not possible in the past (Kienhues and Bromme, 2011). The development of smartphones has done much to forward digital advancement, providing people with Internet access virtually anywhere at any time (Amstutz, 2018). There are, of course, some other important developments that have done much to advance the digital age. *Artificial intelligence* (AI) (sometimes known as "machine intelligence") is a popular concept that has been defined in many different ways. In its broadest and simplest definition, it pertains to the description of a function wherein machines mimic human "cognitive" functions, such as "learning" and "problem-solving" (Russell and Norvig, 2009; Kaplan and Haenlein, 2019). The term "AI" is popularly attributed to computer scientist John McCarthy (1927–2011) in 1955 (McCarthy et al., 2006). McCarthy defined AI as "the science and engineering of making intelligent machines, especially intelligent computer programs" (McCarthy, 2007, para.2).

A closely associated concept is *predictive analytics*, which pertains to various statistical techniques, including *data mining*, *predictive modeling*, and *machine learning*, that analyze current and historical facts in order to make predictions about future events (Siegel, 2013; Kelleher, Namee and D'Arcy, 2015). *Robotics* is another broad concept that concerns the design, construction, operation, and use of robots. This also includes the computer systems needed for their control, sensory feedback, and information processing (Newton, 2018). While robots can take on any form or appearance, some are designed to resemble certain aspects of humans in order to help humans accept the robot's presence in carrying out certain replicative behaviors that are otherwise typically performed by people, such as attempting to replicate walking, lifting, speech, and cognition (Liu, Sheng and He, 2019). There is currently much debate regarding to what degree designers should aspire to design physical human characteristics on robots. The "uncanny valley" is a phenomenon in which humans may experience a feeling of discomfort when interacting with a robot that looks nearly, but not entirely, identical to a human being, while being more accepting of a robot designed with less humanoid features (Van Wynsberghe, 2015).

Terms like "digitization," "digitalization," and "digital transformation" are ever so often confused, as they are often used interchangeably in various settings. Nevertheless, there are distinct differences among the terms, which are important to bear in mind before going forward. The first term, "digitization," entails the conversion of analog material (such as images, video, and/or text etc.) into a digital format (Larsson and Viitaoja, 2017; Feldman, 1997; Brynjolfsson and McAfee, 2014). The second term, "digitalization," refers to a process wherein the use of digital/computer technology (also mobile applications) is adopted, or, alternatively, increased by an actor (Wachal, 1971; Castells, 2010). More often than not, the digital technology is implemented with the intent of establishing a

communication infrastructure that connects various activities of the actor's various processes (Van Dijk, 2012; Larsson and Viitaoja, 2017). "Digital transformation" is a considerably broader term that signifies customer-driven strategic business transformation requiring far-reaching and cross-cutting organizational change in addition to the implementation of digital technologies (Bloomberg, 2018; Cochoy et al., 2017). Due to its scope, digital transformation is in reality not a matter of implementing *one* project, but rather a *whole series* of different projects, effectively necessitating the organization to deal better with change overall. In this way, digital transformation in and by itself essentially makes organizational change a core competency inasmuch that the venture seeks to become customer driven end to end (Bloomberg, 2018).

For this reason, *digitalization* and *digital transformation* are the two most useful/significant terms when explaining the changes and impact that digital technology has had on society at large. That is to say, intelligent algorithms make our day-to-day tasks easier, and it is in many cases nearly impossible to imagine how we could manage without them. The use of AI and robotics continues to gain momentum at a rapid pace. To this end, the idea of digitalizing welfare and the public sector has been seen as a way of providing a more efficient and cost-effective solution in order to cater to the ever-growing demands of the population. Societal challenges, such as a growing and ageing population, along with population increase of chronic diseases and overall lingering financial constraints, have placed the public sector under pressure to find new ways of providing public services while keeping the costs down. The contention is that by using technology in welfare services, it can help secure the continued economic stability of the welfare state. Moreover, another possibility enabled by digital welfare is for the public sector to become more interconnected. Sharing information across the public sector is essential in order to shorten lead times, secure transparency, and ensure that the correct care is given to the right citizen.

To this extent, a 2016 Organization for Economic Co-operation and Development (OECD) report targets specific public-sector areas where governments need to adopt new strategies in order to ensure that they keep an even pace with societal development (OECD, 2016). Specifically, this report emphasizes the focus on digitalization of health care and social care,[1] education, and protection services. The "smarter" use of well-proven assistive technologies in this context was referred to as "digital welfare." Hence, this book has sought to explore topics within these spaces, as these are areas in which the state actors potentially risk being overrun by other non-governmental actors, be they local or global. That is to say, the entry of new actors in these areas has the potential to cause a disruption of the current status quo of welfare services provided by national governments for their citizens, and it is likely this disruption that is escalated through the advancement of "digital welfare."

Ultimately, the discussion of technological advancements raises questions regarding the future role of the nation state in a fully digitalized world (Dasgupta, 2018; Schmidt and Cohen, 2013). Traditionally, the nation state has always been seen as the classic provider of security and basic well-being in exchange

for citizens' loyalty. However, what will happen when new types of loyalties and associations begin to challenge the state's traditional role, that is, loyalties of kindred identities based on shared commercial, political, and/or other interests, rather than religious or ethnic identities? Such a development is not unproblematic for the current nation state. Many citizens, particularly in the West, work for or hold stock in commercial organizations that pay little to no regard to national tax and/or regulatory agencies. To this end, nation states may more often than not adhere to models of welfare provision that increasingly disappoint their citizens and are, moreover, often unaffordable. Thus, the developed Western countries' high-cost, high-tax, high-benefits governance model is coming under an increasingly looming threat of disruption caused by global digitalization. To that end, this book will seek to explore the ramifications of such a societal development.

Moreover, this book seeks to provide an innovative, enriching, and controversial take on society at large and how various aspects of the public sector can be (and are) affected by the ongoing digitalization trend in a way that is not covered by extant literature on the market. While this book covers the welfare state in a broader, Western perspective, many cases covered in this book draw upon Swedish conditions. This is due to the fact that according to the Digital Economy and Society Index (DESI), Sweden (along with Denmark, Finland, and the Netherlands) is one of the most digitalized countries in Europe (European Commission, 2019). This means that the Swedish cases presented tend to reflect a development in a particular area that is, by international standards, often more advanced, as opposed to that seen in many other countries, making the Swedish cases pertinent to study, as they may bear relevance to the future development in other countries in this area. Still, much of the digitalization and digital transformation transcends national borders, and thus much of the subject matter takes on an international character and also includes cases from other countries around Europe and the United States, as it still houses some of the world's most innovative research institutions (Ewalt, 2016).

Following the aforementioned discussion, this book seeks to explore the following areas of the public sectors (and the society in which they exist) and how they are affected by digital welfare:

Health care and social care

- Telemedicine and its impact
- Blockchain in health care
- Digital developments in health care
- Social care and digitally connected devices

Education

- EdTech
- Digital transformation of public education

Citizen protection

- Physical protection, both individual and societal
- Digital protection, data collection, and digital identity

Future of the welfare state

- Potential implications
- The future of cash in a digital welfare state
- New technological institutions
- The future consumption of welfare
- The changing democracy

The studies throughout the included chapters are methodologically and thematically multidisciplinary in nature, with some presenting empirical material and others more theoretical, while others are based on various forms of literature reviews or depart from the authors' personal, "best practice" experiences, and so forth. The book represents a collaborative effort between expert authors with representation from some of the most prominent research institutions and organizations in Europe and the United States, all contributing to a better understanding of the topic at hand. The authors have been instructed to look at the situation of their topic as how it has been, how it is now, and how it might be in the future. To this end, the chapters will base their assumptions in referenced facts, but they may also transcend the conventional academic comfort zone by offering some foresight in how their subject area could transpire based on the current and expected developments due to digitalization and/or digital transformation.

2 Chapter overview

The following section provides a brief overview of the themes and premises discussed in each of the chapters included in this volume.

Part I Health and social care

2 Mårten Blix and Johanna Jeansson – Telemedicine and the welfare state: the Swedish experience

This chapter uses the Swedish example of a vibrant economy and a large public sector as a case to analyze the implications of how digitalization reshapes the welfare services, with emphasis on how telemedicine is set to transform the primary health care services.

3 Anthony Larsson, Olivia Elf, Corinna Gross, and Julia Elf – Welfare services in an era of digital disruption: how digitalization reshapes the health care market

This chapter takes a closer look at how public and private actors react to the emergent use of telemedicine, using the Swedish primary health care market as a case. The study utilizes original empirical data in order to investigate how the changes in the industry brought on by technological advancements affect the actors' perception of their role in the market and their relationship to one another.

4 Anna Essén and Anders Ekholm – Centralization vs. decentralization on the blockchain in a health information exchange context

Drawing upon interviews with individuals involved in the health care sector, this chapter discusses the availability of health data for learning by juxtaposing the governance arrangement of today's state-based health information exchanges (HIEs) with that of a potential decentralized (blockchain-based) HIE scenario.

5 John Øvretveit – Digitalization of health in Sweden to benefit patients

This chapter discusses the digital developments in Swedish health services for patients and citizens to date while also paying attention to the rapid changes expected to occur in the coming years. The chapter proposes that the disruptive potential of new digital services and technologies (DST) is partially dependent on patient advocacy movements and patient organizations and their dissatisfaction with traditional health care.

6 Daniel Wänn – Personalized predictive health care: how predictive AI platforms will transform the health care industry

This chapter looks at the prerequisites for creating a predictive, personalized, and preventative health care platform; how publicly financed health care would be affected; and the broader implications for society.

7 Anthony Larsson and Dominika Sabolová – Digital dentistry: a solution to the dentistry crisis?

The chapter looks at the anticipated impending dentistry crisis in the Western countries due to the shortage of new dentists in the workforce in addition to increasingly more unaffordable dental health care for low-income earners. This has effectively created a possible dental welfare deficit problem, which calls for new, radical solutions. The authors draw upon extant literature and "best-practice" experiences in order to investigate if and how digital dentistry could be used in the future to remedy this dental welfare deficit problem.

8 Andres Laya and Jan Markendahl – Solutions based on digital connected devices for social care and well-being

This chapter considers two aspects of the development of solutions for social care and well-being in Sweden. Drawing upon a number of interviews with technology providers and municipalities, the authors investigate the business challenges preventing the development and uptake of new digital solutions. In addition, the authors discuss the implication of those challenges in terms of the emerging development patterns.

Part II Education

9 Cormac McGrath and Anna Åkerfeldt – Educational Technology (EdTech): unbounded opportunities or just another brick in the wall?

This chapter considers to what extent educational technology has a disruptive or transformative influence on the educational environment today. For the purpose of this study, EdTech is used as an umbrella concept to define and identify a wide range of technologies that have been designed and developed with an outspoken purpose to be used for teaching and learning.

10 Stephen Mahaley – Education at the intersection: a practitioner's view of the effect of digital transformation on public education

This chapter seeks to review the history of public education in the United States through a combination of a literature review, a current event and policy analysis, and practical examples. The study then proceeds by looking at what is happening now with the increasing impact of digital technologies and finally examining the potential futures in terms of what lies ahead for this public good in particular.

Part III Citizen protection

11 Mark A. Conley and Emily Nakkawita – Citizen protection: a capabilities and intentions framework

This chapter conducts a linguistic analysis of the websites of US public and private security-focused organizations in order to analyze the safety and security concern across both groups. Top government contractors continue to apply digital innovations toward defense purposes, and according to polling, US citizens support an increasing private role along with a decreasing public role in delivering safety and security. As the authors argue, although public opinion indicates that taxpayers expect fewer defense capabilities from the government, these structures still broadcast their enduring intentions to provide citizen protection. To

that extent, public-private partnerships are a modern standard in defense, and this relationship in the United States shows no sign of tilting away from government leadership, thus prompting a further analysis into their concern for safety and security.

12 Arne Norlander – Societal security: how digitalization enables resilient, agile, and learning capabilities

This chapter illustrates the relevance and potential impact of digitalization as an enabler of resilient, agile, and learning capabilities for societal security. The author argues that digitalization is essential in building organizations that can not only survive in complex and turbulent situations, but also excel in collective resilience, robustness, redundancy, and adaptability to ensure welfare, health care, food, water, energy, shelter, and security. The chapter explores how digitalization, in times of societal disruption, can add new and reinforce existing capabilities, while also generating vulnerabilities, in the protection of both society and its citizens.

13 Claire Ingram Bogusz – Digital identity – beyond verification: to a transparent (decentralized) system for data and identity monitoring and control

This conceptual chapter explores the existing models of digital identity verification and digital data management before juxtaposing them against emerging alternative solutions, and offering food for thought for policy-makers on how the tensions between digital integrity and data-driven innovation might be resolved using a digital identity management infrastructure. It then outlines some suggestions around how identity verification and data management – as distinct, but important, digital phenomena – might converge to allow individuals better dynamic control over which data are collected, by whom, and for what purposes.

Part IV Future of the welfare state

14 Björn Eriksson and Ulrika Sandhill – Cashless: a dead end for Sweden?

This chapter serves as an investigative commentary on the development of the cashless society in Sweden, the driving forces behind it, the outcome, and its ramifications on welfare. By doing so, the authors seek to provide some "best practice" insights using Sweden as a case in light of similar nascent developments across other digitalizing nations.

15 Charlotte Mattfolk and Lina Emfeldt – Future consumption of welfare services: how the change in consumer expectations will affect offerings and business models in welfare

This chapter takes a qualitative approach in which the authors investigate the future consumption of welfare services to understand what scenarios may emerge given the rapid technological development, changing consumer behaviors, aging population, urbanization, and scarce human resources to cater to future needs. The empirical data have been collected from qualitative interviews and a workshop with representatives from both public and private sectors.

16 Alejandro Moreno Puertas and Robin Teigland – The trust revolution: blockchain's potential to resolve institutional inefficiencies

This chapter provides a qualitative analysis of the potential impact of blockchain on political institutions. The first section offers a brief explanation of blockchain technology, followed by how it relates to the emergence of trust in political institutions. The second section describes the problems that arise from centralizing power, while the third part focuses on blockchain's potential to mitigate some of them. The final section ventures into a discussion of the potential benefits of a blockchain nation.

17 Mats Lewan – The future of the nation-state: how the nation-state can find a way through digitalization

Building on a framework called the "innovation loop" developed by the author, the chapter considers societal evolution largely to be a continuous adaptation to changed conditions brought by innovations. The analysis traces the development of the modern nation-state from the perspective of major human inventions and addresses globalization and the changing role of the nation-state, with less autonomy on one hand but with a new position in an increasingly interconnected world on the other. Three fields where the nation-state needs to adapt are identified – efficiency of services, alternative providers of services, and the structure of the democratic process. The threat from supra-states, localism, and cosmopolitanism is also discussed.

18 Olle Wästberg – Digitalization has changed the foundation of the democracy

This chapter seeks to examine the role of digitalized communication in the US presidential election of 2016 and an exploration of how the digital revolution has changed Swedish politics. In the United States as well as in Sweden, the digital revolution is enabling individual voters to access masses of data and to act and react online, as all the while political parties are eroding. An apparent result of this process is a dramatic polarization of the political conversation. The author

contends that political opinion formation and public information have largely been taken over by digital media.

Note

1 Social care entails the areas that countenance and develop care as an activity and set of relations lying at the intersection of state, market, and family (and voluntary sector) relations (Daly and Lewis, 2000). While distinct from health care, it is for the purposes of this book categorized alongside health care given the fact that it represents a smaller overall scope of the welfare sector as compared to the others mentioned.

References

Amstutz, L.J., 2018. *Smartphones*. Lake Elmo, MN: Focus Readers.

Bloomberg, J., 2018. *Digitization, digitalization, and digital transformation: confuse them at your peril*. [online] Forbes. Available at: <www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confuse-them-at-your-peril> [Accessed 11 Sep. 2019].

Brynjolfsson, E. and McAfee, A., 2014. *The second machine age: work, progress, and prosperity in a time of brilliant technologies*. New York, NY: W.W. Norton & Company.

Castells, M., 2010. *The rise of the network society: the information age: economy, society, and culture*. 2nd ed. Chichester, UK: Wiley-Blackwell.

Cochoy, F., Hagberg, J., McIntyre, M.P. and Sörum, N., 2017. Digitalizing consumption: introduction. In: F. Cochoy, J. Hagberg, N. Sörum and M.P. McIntyre, eds. *Digitalizing consumption: how devices shape consumer culture*. London, UK: Routledge, pp. 1–19.

Crone, P., 2005. *Medieval Islamic political thought*. Edinburgh, UK: Edinburgh University Press.

Daly, M. and Lewis, J., 2000. The concept of social care and the analysis of contemporary welfare states. *The British Journal of Sociology*, 51(2), pp. 281–98.

Dasgupta, R., 2018. *The demise of the nation state*. [online] The Guardian. Available at: <www.theguardian.com/news/2018/apr/05/demise-of-the-nation-state-rana-dasgupta> [Accessed 11 Sep. 2019].

European Commission, 2019. *The digital economy and society index (DESI)*. [online] Digital Single Market Policy. Available at: <https://ec.europa.eu/digital-single-market/en/desi> [Accessed 11 Sep. 2019].

Ewalt, D., 2016. *The world's most innovative research institutions*. [online] Reuters. Available at: <www.reuters.com/article/us-innovation-rankings/the-worlds-most-innovative-research-institutions-idUSKCN0WA2A5> [Accessed 11 Sep. 2019].

Feldman, T., 1997. *An introduction to digital media*. New York, NY: Routledge.

Hardey, M., Loader, B.D. and Keeble, L., 2009. Introduction. In: B.D. Loader, M. Hardey and L. Keeble, eds. *Digital welfare for the third age: health and social care informatics for older people*. London, UK: Routledge, pp. 1–14.

Kaplan, A. and Haenlein, M., 2019. Siri, Siri, in my hand: who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), pp. 15–25.

Kelleher, J.D., Namee, B. Mac and D'Arcy, A., 2015. *Fundamentals of machine learning for predictive data analytics: algorithms, worked examples, and case studies*. Cambridge, MA: MIT Press.

Kienhues, D. and Bromme, R., 2011. Beliefs about abilities and epistemic beliefs: aspects of cognitive flexibility in information-rich environments. In: J. Elen, E. Stahl, R. Bromme and G. Clarebout, eds. *Links between beliefs and cognitive flexibility: lessons learned*. Dordrecht, Netherlands: Springer, pp. 105–24.

Larsson, A. and Viitaoja, Y., 2017. Building customer loyalty in digital banking? A study of bank staff's perspectives on the challenges of digital CRM and loyalty. *International Journal of Bank Marketing*, 35(6), pp. 858–77.

Lindbeck, A., 1996. *Incentives in the welfare state: lessons for would-be welfare states*. Working Paper No. 449. Stockholm, Sweden.

Liu, J., Sheng, L. and He, Z-Z., 2019. *Liquid metal soft machines: principles and applications*. Singapore, Singapore: Springer.

McCarthy, J., 2007. *What is artificial intelligence?/Basic questions*. [online] Available at: <http://www-formal.stanford.edu/jmc/whatisai/node1.html> [Accessed 11 Sep. 2019].

McCarthy, J., Minsky, M.L., Rochester, N. and Shannon, C.E., 2006. A proposal for the Dartmouth summer research project on artificial intelligence, August 31, 1955. *AI Magazine*, 27(4), pp. 12–14.

Newton, D.E., 2018. *Robots: a reference handbook*. Santa Barbara, CA: ABC-CLIO.

OECD, 2016. *Digital government strategies for transforming public services in the welfare areas*. [online] OECD Comparative Study. Available at: <www.oecd.org/gov/digital-government/Digital-Government-Strategies-Welfare-Service.pdf> [Accessed 11 Sep. 2019].

Russell, S.J. and Norvig, P., 2009. *Artificial intelligence: a modern approach*. 3rd ed. Upper Saddle River, NJ: Prentice Hall.

Schmidt, E. and Cohen, J., 2013. *The new digital age: reshaping the future of people, nations and business*. London, UK: John Murray.

Siegel, E., 2013. *Predictive analytics: the power to predict who will click, buy, lie, or die*. Hoboken, NJ: Wiley.

Van Dijk, J.A.G.M., 2012. *The network society: social aspects of new media*. 3rd ed. London, UK: Sage Publications.

Van Wynsberghe, A., 2015. *Healthcare robots: ethics, design and implementation*. Farnham, UK: Ashgate.

Von Kersbergen, K. and Vis, B., 2014. *Comparative welfare state politics: development, opportunities, and reform*. New York, NY: Cambridge University Press.

Wachal, R., 1971. Humanities and computers: a personal view. *The North American Review*, 256(1), pp. 30–3.