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Introduction: Advancing Theory on Workplace Information Literacy

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In today's world, information plays an increasingly essential role in the smooth functioning of our society (Dufva and Wäyrynen, 2020). The last few decades have seen a considerable surge in the production and consumption of information at all levels and spheres of society across family, media, education, religion and the workplace. Even pre-industrial eras of humanity were dependent on information for societal advancement. Nevertheless, the phenomenal growth in the volume, velocity and variety of information alongside technological developments has resulted in the novel ways in which information contributes to social and economic development. At no point in history did human welfare and progress so much depend on efficient management of information as today (Floridi, 2009; Ziemba, 2019). Whether we can claim to have developed a perfect information society is subject to debate. But, without doubt, the world has experienced extensive 'informatisation' resulting in the information industry becoming a major part of modern economies while simultaneously changing the ways in which people interact with information in their day-to-day lives. All while technology is becoming embedded in everything and attention on equity aspects of digitalisation becomes increasingly important (Dufva, 2020).

The evolution of modern information societies has been possible largely because of technological developments and we have been living the digital transformation for quite a while now (Hilbert, 2022). Information and communication technology (ICT) has enabled us to connect in unprecedented ways. The information landscape of the world would not have been this dynamic if it was not for the affordances of information technology. Digital tools and technologies are increasingly part of our everyday life as well as our working life, affecting how we communicate, interact and perform different activities. Technology also comes with important challenges, such as risks with use of data, who decides how to develop technology and for what purposes (Dufva and Wäyrynen, 2020). Some technologies have been around for so long that they are already well integrated into our ways of acting. Still, we are in the midst of rapid technological development and new digital innovations are constantly

knocking on the door, asking for an agile introduction to our everyday lives, to workplaces and to society at large.

Workplace digitalisation and informatisation

Work and workplaces constitute a substantial part of society and are defined as a place or activity to produce something, an intentional engagement that may or may not be compensated (Cairns and Malloch, 2011, 7). Workplaces are often described as complex, competing in markets and demanding innovation to survive (Lloyd, 2017). Digital innovations, particularly in information technologies, have greatly transformed the workplace domain of society. Organisations are investing in technologies and information infrastructure to enable employees to connect, collaborate and communicate seamlessly within and across organisational boundaries as well as time and space, leading towards the digitalisation of workplaces (Byström, Heinström and Ruthven, 2019; Holmström Olsson and Bosch, 2020). New forms of collaboration enabled by information technologies have connected different work processes, departments, geographic units and external stakeholders. Previous research has suggested that seamless information flow in digital workplaces has contributed greatly to improving work productivity as well as overall organisational performance (Eller et al., 2020). Moreover, an organisation's ability to have close customer and supplier relationships has been greatly enhanced by real-time information flow across organisational boundaries. In many organisations, emerging technologies such as big data, artificial intelligence and the internet of things have now integrated machine-driven information processing and knowledge creation into organisational decision-making, simultaneously building organisations' agility to respond to market changes (Van der Voort et al., 2021).

Digitalisation has made our work more associable, editable, interactive, programmable, traceable, communicable and distributable and is therefore shaping the workplace and its organising logic (Kallinikos, Aaltonen and Marton, 2013). But it also comes with substantial changes to ways of working. New technologies almost always translate into new work processes, work arrangements, collaborative engagements and hence disrupt the information environment and consolidate equilibria at work (Byström, Heinström and Ruthven, 2019). Although the pervasiveness of modern ICT benefits flexibility at work, it also exposes employees to new dynamics of information creation, sharing and management (Fuglseth and Sørebo, 2014). For example, as evidenced during the recent COVID-19 pandemic, the shifting of work-related employee interaction and task performance from a physical to a virtual environment reshapes the boundary of an organisation's information environment and consequently raises issues of privacy and data

security (Teebken and Hess, 2021), work-life conflict (Adisa, Gbadamosi and Osabutey, 2017) and information overload (Bawden and Robinson, 2021). Digitalisation-driven alteration of work arrangements and communication also creates power asymmetry and digital inequality. There is evidence that the introduction of new ICTs disturbs the information ecosystem of an organisation (Palumbo, 2021). Technology savvy people are more proficient in dealing with information sharing, creating and access than technology neophytes whose information experiences are overshadowed by the complexity of new technologies and are hence put at a disadvantage. In the long term, this creates trust and fairness issues in organisations, which are known to affect knowledge sharing and an organisation's innovation potential (Palumbo, Manna and Cavallone, 2020).

Another major change experienced due to the intensive digitalisation of the workplace is loss of workflow control (White, 2012). Enhanced connection has been known to become a major source of distraction and work disruption in the workplace. The ability to send and receive e-mails at any time and at any place means there is less control on information inflow. According to Thomas (2019), it takes at least 20 minutes for an employee to get back to work after e-mail interruption. This often leaves people with exhaustion and the feeling that nothing has been accomplished during the day. Blurring of the boundary between work and home is further fuelling this problem as it is now difficult to completely disconnect or block information inflow while not at work. The concept of space in the workplace now encompasses virtual environments and extends far beyond the physical premises of the workplace. The COVID-19 pandemic further amplified these challenges (Vallo Hult, Isind and Norström, 2021).

There is also a paradigm shift so that many information activities once thought to be performed by specific professionals have now become part of the work of every employee. In addition to developing fluency in information tools, employees are now expected to understand and consume information in accordance with social, organisational and industry-specific ethical, legal and security standards. For example, even though information security professionals are responsible for protecting organisational information assets, other employees, such as marketing professionals, are expected to protect their work-specific information and be vigilant of threats such as hacking and phishing.

The rising complexity and amount of information, accompanied by developments in information technology, have transformed workplaces into complex systems of information flow making extremely efficient management of information a prerequisite for enhanced performance and innovation. To counteract the possible negative consequences, an explicit digitalisation strategy is needed, along with early communication and employee involvement

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and continuous training and lifelong learning (Eurofound, 2021). With rapid technological development, having modern information systems and devised information flow structures presents a risk for organisations. However, employees' capacity to effectively deal with information still needs to catch up, which brings up the importance of the continuous development of information literacy in the workplace.

It is crucial to continuously update information capabilities, both to navigate through the changing information landscape and to fully capitalise on new technologies and workplace digitalisation. Rather than focusing on how to master new information technology during digital transformation, there is a need to pay much more attention to how we master all the information that is produced as a result of new technologies. The need for digital skills is widely acknowledged, but the skills and competencies needed after first learning how to master the technology and tools is taken for granted. Clearly it is not only about technological skills. As the volume of information increases, so does the difficulty in differentiating between right and wrong, relevant and irrelevant, and real and fake information (Hemp, 2009). Also, there is a growing risk with the vast amount of data and information in relation to privacy, safety and security (Hoe-Lian Goh et al., 2019). To make the most out of digital transformation, it is critical that we also master the selection of relevant information sources in a complex information environment, that we foster our ability to think critically and make balanced judgements about any information we find and use, and that we better understand how to support and enhance new information and communication practices that emerge through digital innovation. This is possible only through continuous development of information literacy – all these capabilities are constituents of workplace information literacy.

Aim of the book

Information literacy is crucial in dealing with new forms of information experiences, realities and work organisations actualised by the permeation of ICT in organisations. There is a dearth of research on how workplace information literacy plays out in digital environments. This book aims to bring forward the role of workplace information literacy as a key condition for successful digitalisation or digital transformation in today's workplaces, as the compass through digital transformation, the conditions and the impact of information literacy in the digital workplace. Moreover, it aims to extend the critical debate on the impact of digitalisation on individuals and organisations. As technological innovations grow, so will their role in the workplace. In this regard, it is indeed timely to explore the multifaceted role of workplace information literacy in organisational operations. In doing so,

we also contribute to the individual's perspective on the organisational digital transformation debate, which has often been overlooked and neglected. In the following section, we shed more light on information literacy in the workplace. After that, we provide an overview of the book and a short discussion of why it is important to advance workplace information literacy theory, research and practice together.

Defining workplace information literacy (WIL)

Information literacy (IL) has been addressed as an important capacity since the 1970s (e.g., Zurkowski, 1974). The need for information handling skills has been discussed in similar ways for nearly 50 years, referring to an overabundance of information exceeding our capacity to evaluate it. The IL concept has primarily been developed within educational contexts and is acknowledged as an important support for learning. However, it is also understood as a socio-cultural construct, affected by situation and context (Lloyd, 2005; Tuominen, Savolainen and Talja, 2005). Since 2005, research on IL has increased, with strong technology-related motivations. The interest in IL has successively reached disciplines outside education and library and information science, such as health sciences and media, and the need for a number of new literacies, such as financial literacy, health literacy and internet literacy, has been introduced. With the growing interest in the concept of IL, a lack of good evaluation measures to study its impact has been identified (Li, Chen and Wang, 2021; Widén et al., 2021). In the workplace context, the interest in IL has grown in step with digital transformation. IL is often seen as a combination of formal information skills and the skills needed to master digital tools and technologies, but it is also constructed and affected by workplace information culture and information practices.

The number of IL definitions is almost endless and there are many systematic overviews of the different definitions, the development of the concept and its use in various contexts (e.g., Sample, 2020). The main challenge is that IL is highly context dependent and it is crucial that the concept is clearly defined every time it is studied or discussed. In this book, we are focusing on IL in the workplace context and follow to a large extent CILIP's definition:

In the workplace, information literacy is knowing when and how to use information in order to help achieve organisational aims, and to add value to organisational activities. [...] The exact nature of information literacy is highly dependent on the context of the workplace, and it reflects workplace culture, practices and experiences.

(CILIP, 2018)

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In the workplace context, IL has increasingly been studied empirically, bringing an in-depth understanding of the information handling skills required in contemporary workplaces. IL has been identified as a key capability in workplace learning, helping organisations to effectively leverage information to create business value, such as innovation (Ahmad, Widén and Huvila, 2020; Forster, 2017; Middleton and Hall, 2021). As digital transformation is largely about change, that is, learning new information tools and technologies to master a complex information environment, the transition itself becomes a relevant context of study when developing WIL support (Hicks, 2020; Sharun, 2021).

In today's workplace, the digital aspect of IL is of course crucial and is often focused as digital literacy (DL). DL is defined as the awareness, attitudes and ability to appropriately use digital tools to manage information in the digital age. This includes the ability to identify, access, manage, integrate, evaluate, analyse, synthesise, construct, create and communicate information (Martin and Grudziecki, 2006; Bawden, 2008). IL is a broader concept than DL, including information in all forms and formats, while DL focuses on the ability to use digital tools to manage information. Different chapters in this book may have slightly different approaches to IL, as well as WIL and DL, and might focus on DL instead of the more general IL approach. However, the concept is clearly defined in relation to every chapter to make the conceptual understanding as clear as possible throughout the book. These definitions are further elaborated in Chapter 1.

The chapters

The chapters of this book are organised into four main perspectives: conceptual matters regarding WIL (Chapters 1–2); methodological aspects (Chapters 3–4); WIL from a process perspective (Chapters 5–6); and from an impact perspective (Chapters 7–8). The book is summarised in the final chapter, Chapter 9, where we also discuss future developments and the importance of research in this area.

Conceptual matters

In this section, the two chapters discuss the complexity of the IL concept and the importance of acknowledging the digital and technological infrastructure as an active part of forming WIL. Chapter 1 reports on a systematic literature review, pointing at the growing interest in the IL concept. The chapter also discusses the challenges in covering IL research due to the many related concepts and the many different disciplines in which IL is studied. With the growing interest in the concept as a result of the rapid

development of digital transformation, there is clearly a challenge in effective knowledge exchange between disciplines, as well as between theory and practice.

Chapter 2 takes a post-digital approach to DL, shifting the focus from individual practice to a sociomaterial perspective looking at DL as a practice enacted by humans and technology combined. This is important in a workplace context where we need to have the consequences of practice in mind. The chapter builds on Lloyd's (2010) conceptualisation on IL as sociocultural practice, but adds the materiality aspect into the social setting, giving technology a more active role as an agent in producing practices. This means that we need to look at DL beyond the human-centric approach. It also gives a time factor to the process of developing DL practices. It is not only about DL giving humans the ability to use digital technology, but also how DL is enacted in practices performed by humans, materials, objects, technology and algorithms, all connected to each other.

Methodological aspects

As previously noted, the concept of WIL is complex and hard to study. Chapter 3 takes on the task of mapping out commonly used methods and practices for measuring IL. The chapter provides an overview of how qualitative, quantitative and mixed-methods have been used when studying IL, showing that the choice of methods depends not only on how IL is understood and defined, but also that there are different methodological practices in different disciplines. In the workplace context, qualitative methods have been applied more often, but to address the complexity of WIL, the chapter also puts forward the need for a mixed-method approach, such as fuzzy-set qualitative comparative analysis (fsQCA), to develop a multifaceted understanding of WIL.

Chapter 4 presents a methodological discussion and a novel approach to studying actual information seeking and sharing practices, following digital trace data. The growing amount of digital trace data provides a range of opportunities to observe and study information activities and how they have changed on a longitudinal scale. It also opens up possibilities for new insights regarding how to support employees' WIL. As organisations increasingly trace the information behaviour of their employees' overtime, and as digital records capture what information was shared and retrieved across the organisation, individuals should learn how to use these records from past operations to improve the current ones. As more and more information on individuals' behaviour is recorded in organisations, there is a need for skills and competencies to master those records to bring value to either the individual or the organisation. In other words, making sense of organisational

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digital trace data (that is often very context-specific) adds a dimension to WIL that is very dependent on context (e.g., organisational design, business processes, ICT systems in use). Independently of the workplace context, an information literate professional should be able to make sense of the digital trace data records from the past to bring value to the present.

Process and transition perspectives

In this section, the chapters focus on WIL in more specific contexts, with an emphasis on developing IL in a collective process and in a process of transition. Chapter 5 explores IL from a specific but very important and challenging perspective, namely in relation to sensitive information within high-security organisations, where information is not readily available to everyone. IL becomes a collective resource where the employees together achieve IL in terms of how to use, manage and benefit from the information to achieve common goals. When information cannot be openly available, hinting and the role of trust become important parts of building WIL in such high-security settings.

Chapter 6 looks at WIL in terms of how work-related IL can, and should be, transferred between jobs and during an individual's career. It is important to look at WIL beyond the single workplace and identify IL in terms of employability. In doing so, this chapter presents a roadmap of IL skills supporting employability, as well as how to manage these skills during career development and transitions between workplaces or professions.

Impact perspectives

Chapter 7 investigates the impact of WIL on work satisfaction, with special focus on one central component: information sharing. The insights in this chapter are based on an analysis of open access, large-scale quantitative data (Programme for the International Assessment of Adult Competencies (PIAAC)), contributing also to the methodological discussion. The study demonstrates that information sharing is associated with work satisfaction and it is put forward that management should encourage and facilitate information sharing in combination with supporting information sharing skills, willingness and motivation. A holistic understanding of WIL is emphasised, including not only skills but also mindset and motivation.

Chapter 8 discusses the importance of IL in the entrepreneurial work setting. The focus is on entrepreneurs' intentions to select and use digital information sources and shows that their IL influences their ability to find, select and access relevant information sources, contributing positively to the growth of their business. In light of the results, it is recommended that

entrepreneurial programmes should focus on IL as a motivational factor independently of gender or age.

Importance of advancing WIL theory, research and practice

Digital transformation is primarily about change, which in turn requires a change in attitudes, skills and ways of working. It is obvious that we need more technical skills in the workplaces of the future, such as programming, digital production and data analytics. In addition to that, the future workplace needs people with more general technological competence who know how to use digital technologies and how to interact with computers taking over some of the work tasks previously managed by humans. These competencies must also be integrated with other workplace competencies to be efficient, such as leadership competencies, creativity, agile work practices, communication and negotiation (Ek and Ek, 2020). To drive digital transformation, we need good information and knowledge management to lead people and information processes, ensuring that information and knowledge are valued as important resources. Part of information and knowledge management is understanding and developing open information cultures in which it is easier to quickly adapt information and knowledge processes to continuous change. In this equation, WIL has a clear role, which is also shown in the chapters of this book in various ways.

The aim of the book is to bring forward the role of information literacy as a key condition for successful digitalisation in today's workplaces and extend the critical debate on the impact of digitalisation on individuals and organisations. The focus is on IL, which is a complex concept in terms of defining it clearly, finding suitable measures for studying it in the workplace context and in identifying its impact. In this book we have taken on all these challenges. The chapters contribute to mapping the development of the concept of WIL and bringing it into a post-digital era where employees, organisational culture and the digital infrastructure together shape the framework for WIL. The book clearly shows the need for methodological development in order to study WIL in various contexts. We need to go beyond traditional mono-method approaches to include mixed-methods and the use of digital data that is rapidly produced and can be traced to reflect our actual information activities and practices.

The book also discusses the need for understanding WIL as a collective process and that we cannot always focus on individual IL skills alone. For example, in settings where information is sensitive, the workplace might need other, collective actions to manage the information effectively. WIL

should also be seen from a transition perspective, that is how employees' IL is transferred between workplaces or throughout their career so that it is utilised in the most effective way. Finally, the book gives examples of the actual impact of IL, both on a large scale that shows WIL across workplaces and countries and, more specifically, how IL significantly influences entrepreneurs' access to and selection of information sources for the benefit of their business success. Although the book advances a conceptual, methodological and practical understanding of WIL in today's digital workplaces, it is clear that we still need to develop all these areas – this is further discussed in the last chapter of the book, Chapter 9.

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