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Understanding the Role of Employees in Digital Transformation: Conceptualization of Digital Literacy of Employees as a Multi-Dimensional Organizational Affordance

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Abstract
Purpose
Much of recent academic and professional interest in exploring digital transformation and enterprise systems has focused on the technology or the organizations' external forces, leaving internal factors, in particular employees, overlooked. The purpose of this paper is to explore digital literacy of employees as an organizational affordance to capture contextual factors within which digital technologies are situated and are used.

Design/methodology/approach
We used the evidence-based practice for information systems approach and undertook a systematic literature review of 30 papers coupled with brainstorming with 11 professional experts on the neglected topic of digital literacy and its assessment.

Findings
This paper draws upon affordance theory and develops a novel framework for conceptualization of digital literacy of employees as an organizational affordance. We do this by distinguishing digital literacy at the individual level and organizational level, and by assessing digital literacy through Information/Cognitive and Social Practice/Articulation affordances.

Research Implications
The current paper contributes to the notion of organizational affordances by examining the effect of interactions between employee-technology through digital literacy of employees in using digital technologies. We offer a novel conceptualization of digital literacy to improve understanding of the role of employee in digital transformation and utilization of enterprise systems. Thus, our definition of digital literacy offers an extension to the recent discussions in the IS literature regarding the actualization of affordances by bringing a lens of employees into the process.

Practical Implications
This paper operationalizes digital literacy at organizational and individual levels and offers managers a high-level tool to assess digital literacy of their employees. By doing so, managers can achieve the fit between employees' capabilities and digital technologies that will improve affordance actualization and support their digital transformation initiatives.

Originality
The study is one of early attempts to apply and extend affordance theory on digital literacy at organizational level by not limiting the concept to the individual level. The proposed framework improves the communication among researchers and between researchers and practitioners.

Keywords: affordance theory, digital transformation, employee experience, digital literacy, assessment, digital skills

1. Introduction

Digital transformation has been described as the change in an organisation`s structure, processes, functions, and business models due to the adoption of digital technologies (such as internet of things, artificial intelligence, machine learning, augmented reality, in-memory computing) (Matt et al. 2015; Sahu et al. 2018). The existing literature on digital transformation is largely focused on external stakeholders, notably their relationship with customers, while it ignores the role of digital skills of workforce in this process (Murawski and Bick, 2017; Nadeem et al., 2018). Organisations need to equip their workforce with digital skills to meet the organisational objectives if they want to benefit from their investments in technologies (Kane et al., 2019; Blount et al., 2016). As stressed by Westerman (2016), "digital transformation needs a heart", reminding managers not to "forget that it is people who make companies work" and underlying the fact that mismanagement of digital forces could harm the relationship with employees.

Skills, knowledge and abilities of a person or social group used while interacting with digital technologies is described as employees' digital literacy (Dordy, 2015), which is beyond traditional literacy perception limited purely to the ability to read, write and use printed texts in various contexts (Littlejohn et al., 2012). Research previously has considered digital literacy of employees as a critical dynamic capability of organizations during their digital transformations (Vial, 2019; Warner & Wäger, 2019). Recent studies have stressed that the greatest challenge in many organizations in digital transformation and innovation is finding a way for re-imagining the employees' experience and bringing their digital literacy up to date (Kane et al., 2019; Dery et al., 2017; Miozzo and Ramirez, 2003). For instance, Mathrani et al (2013) found strategic benefits of enterprise systems implementation not only in incorporating the essential data and technology factors, but also in planning for and accommodating factors like people and process management as well as skills and competency development.

While the academic literature has widely overlooked how the challenges of digital technologies are handled at the employee level (Vial, 2019), many professional reports (Liley et al., 2017; McKinsey Global, 2017) and a number of recent academic research (Kane et al., 2019; Warner & Wäger, 2019) underline the critical role of digital literacy of employees in digital transformations vis-à-vis technology. A European Union report has found that approximately only one per cent of non-executive directors in Europe's top 100 companies have proven digital skills (Boersma, 2015). This fact itself is an alarming indication for calling on researchers to understand digital literacy of employees, a competency set required for the development and implementation of digital technologies so that it could become possible to develop strategies and policies to deal with the shortage of digital skills (Bokek-Cohen, 2018; Murawski & Bick, 2017; Weill et al., 2019).

Despite a wide recognition of its importance, past research has merely examined employees' digital literacy from the individual perspective and hence discounted its organizational dimension (Littlejohn et al., 2012; Bricks & Makic, 2012; Wagner et al., 2014). Organizational dimension of employees' digital literacy is important, as individuals' skills and knowledge about possibilities of digital technologies develop and shape from interactions with other employees within the organization. Eden et al. (2019) stress on the organizational dimension of digital literacy of employees, and found that organizations need to build an ongoing digital workforce transformation competence and support workforce transformation to create a strong cultural foundation to enable the workforce to navigate the turbulence and

continuous response to change. To simultaneously enrapture individual and organizational dimensions, we conceptualize digital literacy as an organizational affordance. By doing so, we aim to join studies trying to understand how to achieve the fit between employees and new technologies that will allow/afford a set of actions and activities at organizations (Anderson & Robey, 2017; Vyas et al., 2017).

Affordance has been described as a one-to-one relationship between a user and an artefact (Yvas et al., 2016). The concept of affordance has been previously stretched beyond its original definition for usability analysis towards the actualization of affordances in organizational contexts (Anderson & Robey, 2017; Du et al., 2017; Santoso et al., 2019; Stigliani & Ravasi, 2012; Strong et al., 2014). Strong et al. (2014) initially introduced the theory of actualization of technology affordances, while Anderson & Robey (2017) later developed the concept of affordance potency. Inspired by the idea of importance of practice (Orlikowski, 2000), this line of thinking has been extended by Yvas et al. (2017) and others (e.g. Du et al., 2019) to highlight organizational contexts in better understanding the fit between a technology and an individual or group. We build on existing research on affordances in organization and pose that digital literacy can be described as a one-to-one relationship between employees and digital technologies in an organization (Figure 1). We then operationalize digital literacy as a multi-dimensional construct consisting of information and articulation affordances taking place in an organization. This is as affordances show emerging possibilities for individual and collective actions in social and cultural contexts, actively constructed by technology users in their everyday practices through both doing and interpretation. We argue that considering the role of employees in organizations helps to utilize digital technologies (Anderson & Robey, 2017) since organizations with their internal social and cultural dynamics allow a space for multiple user interpretations and plausible behaviors (Yvas et al., 2016). As Anderson & Robey (2017) stress, these behavioural opportunities available to an actor in the environment/workplace do not automatically result in actualization. The above authors point out that employees need to have skills for perceiving the opportunities and for transforming them into actual use.
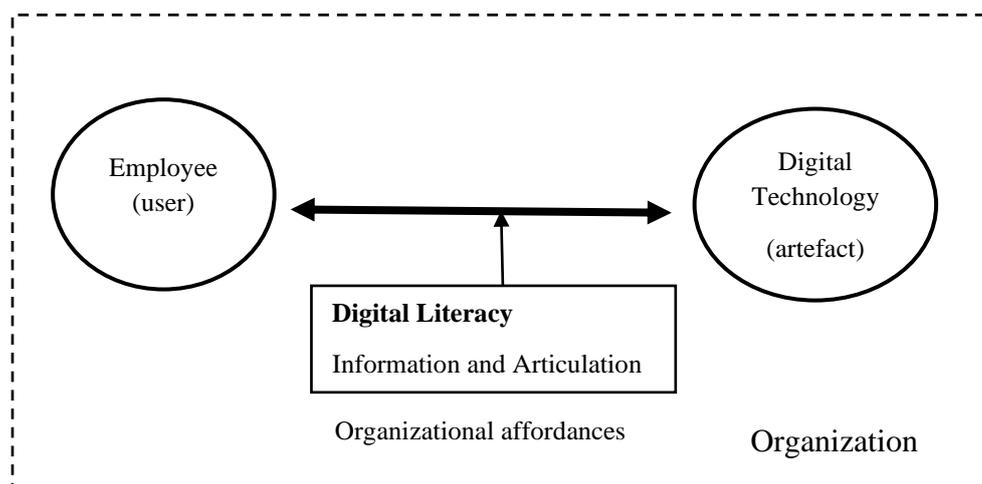

Figure 1. Digital literacy as an organizational affordance

Thus, the objective of this study is to answer three questions: (i) what does digital literacy entail, and how it has been measured? (ii) what does digital literacy mean as an organizational affordance? And (iii) how digital literacy, as an organizational affordance, can

be measured? The first question aims to firstly improve our understanding of what digital literacy means from the perspective of past studies in the literature as well as from the perspective of experts in the field. Next, we present what digital literacy means and how it can be measured as an organization affordance. We do this by drawing on the expanded affordance theory emphasizing the actualization of affordances by drawing attention to how technologies affect practices and vice versa in organizational context (Anderson & Robey, 2017; Vyas et al., 2017; Orlikowski, 2000; Orlikowski & Scott, 2008). We examine the role of digital literacy in digital transformations by taking an evidence-based practice for information systems (EBIS) approach as proposed by Wainwright (et al., 2018) to ensure our research makes both theoretical contributions to the body of knowledge and is strongly relevant to the practice.

The paper has five sections. After this introduction, background section introduces key theoretical concepts of digital technologies & transformations, organizational affordances, and digital literacy that helps to underline the conceptualization of digital literacy as an organizational affordance. Method section explains the methods used in the paper: systematic literature review and expert interviews. Findings section presents findings from the literature and expert inputs, while conclusions section points out contributions of the study and point out future directions.

2. Theoretical Background

2.1. Digital technologies and transformation

Digital technologies consist of a group of "powerful, accessible, and potentially game-changing technologies like social, mobile, cloud, analytics, internet of things, cognitive computing, and biometrics" (Ross, 2017). Research has shown diverse and profound impact of digital technologies on organizations (Vial, 2019; Warner & Wäger, 2019; Abedin et al., 2014). For example Nambisan et al. (2017) point out two dimensions being critical: (i) products or services embody many new features such as malleability, editability, openness, and transferability and (ii) production and innovation processes become not only highly unpredictable and dynamic but also carried out through distributed innovation agencies.

In its simplest definition, digital transformation is an ongoing process of using new digital technologies in everyday organizational life (Warner & Wäger, 2019). Due to the unique nature of digital technologies, digital transformations introduce many challenges to managers and decision makers (Abedin & Babar, 2018). They bring in sets of affordances but also constraints. Further, these challenges are not confined to a single organization, since the use of digital technologies take place across organizations as well through the formation of platforms. Digital platform is a combination of hardware and software that provides standards, interfaces, and rules. Platforms lead into a formation of ecosystems where providers of complements add value and interact with each other and/or users belonging to the particular platform (Teece & Linden, 2017). That is why, the question raised by the affordance theory regarding why the same technology can be repurposed by different actors is more critical to understand in the case of digital technologies since different platforms tend to use technologies in different ways and get different results (Nambisan et al., 2017). Any improvement in understanding the mechanisms behind affordances could improve the performance and innovativeness of both individual organizations and their platform partners/stakeholders.

2.2. Organizational affordances

The notion of affordance was initially brought to the human-computer interaction context as a design aspect that guides the use of objects (Gibson, 1986; Norman, 1988). The original affordance theory was interested in the action possibilities offered by the environment to an individual, while it has been neglecting the role of the individual's ability to perceive and realize any particular possibility. Vyas et al. (2006 and 2017) extended this concept, and proposed an 'interaction-centred approach' or a relational framing of affordance where affordance emerges as an interpretive relationship between users and the technology that takes place in actual practice. Based on this new conceptualization, we consider digital literacy as one of the key skills needed in the era of digital transformations that can manage complementarily of actors' capabilities with the action possibilities arising from digital technologies.

In an organizational context and when an artefact or a technology is situated in or used by a group of users, a broader view of affordances covers social and cultural aspects of technology use (Gibson, 1986). Ellison et al. (2015) applies the notion of organizational affordances on enterprise social networks sites for knowledge sharing, and articulates how these affordances of these sites may shape knowledge sharing through support for relationships and interactions and network interactions. Technologies-in-practice (Orlikowski, 2000) suggests that in an organizational context, different uses of a system can appear based on how people enact with it.

That forms the base for the affordance actualization theory, arguing that affordances and their actualization are separate phenomenon where organizational context plays a critical role (Du et al., 2019). For example, Yvas et al. (2006) gives the following example: computing power is a digital technology and it has potential to be used to run simulations but user of that technology need to find out its potentiality by him/herself or articulate the way it will be used through interactions by its users/employees at the company. By understanding the 'digital', employees can make sense of the tools and create new insights (not just using it for their intended purpose). Employees actively interpret their situation in the organization and make sense of the digital technology while being involved in certain activities such as knowledge creation by using social media (Wagner et al., 2014). This kind of social construction of technology perspective is recently adapted to examine the roles played by work and personality-related factors beyond age and generational differences in the use of social technologies in and for work (Jarrahi & Eshraghi, 2019).

Yvas et al. (2017) introduce three levels to explore a broader understanding of affordances: single user, organizational and societal levels. In other words, the relationship can be between a user and a specific technology (individual level), or it might be one-to-many (the organizational) or it could be many-to-many (society level). Our focus in this paper is on the organizational level, as we try to understand the relationship between employees and the ways digital technologies are enacted in companies. Again, following the arguments of Yvas et al. (2006) and (2017), we propose that technology and interpretive conditions could shape affordances of employees in an organization during digital transformations. This is because digital technologies are dynamic and their functionality, design features and infrastructure influence the emergence of affordances by providing the technical facilities of work and social interaction (Anderson & Robey, 2017). In a similar vein, interpretive conditions refer to the meaning attached to technology; hence, each organization targets to achieve a set of

goals for investing in digital technologies, thus both employees' knowledge and attitude towards them will determine the affordances of these goals.

2.2. Digital literacy

Given that digital literacy constitutes a set of skills and abilities of a person or social group used while interacting with digital technologies (Dordy, 2015), it is not a surprise that as employees' digital literacy increases, utilization of digital technologies takes place more effectively (Abedin et al., 2012). Employees not only can conceive possibilities arising from digital technologies but also put them into use and learn from interactions to adapt their behaviour and find new ways of using technologies through their daily practices. Thus, increasing digital literacy of employees could allow them to take advantage of one or more affordances through their use of digital technologies (Du et al., 2019). If managers could understand the level of digital literacy of their organizations, they could improve it and prepare their workforce for future needs related to digital transformations. By doing so, they could win the "hearts and minds" of their employees so that they will outperform their competitors who treat their employees as machines (Westerman, 2016).

From an organizational affordance point of view, the fit between a technology and an individual or group can determine a particular set of actions or activities arising from that particular technology (Vyas et al., 2017). Thus, employee interaction with the technology is influenced by their ongoing personal and social assessment of and perception of fitness with the technology, which collectively forms organizational affordances at a group level. As the work of Murawski and Bick (2016) highlights, the main challenges for organizations is to adapt their culture, mind-set, and competences to the new, digital way of working rather than to technological trends, disruptive innovations, nor new customer behaviour. The shift towards culture, mind-set and competences demands a focus on employees. If they are not digitally literate, it could be highly difficult to survive digital transformations. For example, an article (Meister, 2017) talks about the increased use of digital co-workers called as chatbots, software that participate in the day-to-day activities of the company as an active and engaged member of the team they belong. However, if employees are not ready for these kinds of digital technology applications, employee experience practices will not achieve the goal of creating a personalized, compelling and memorable environment for employees. It will rather generate information overload and anxiety apply employees (Bawden and Robinson, 2009).

3. Research Design

Increasingly IS and Information Management (IM) researchers are encouraged to apply a greater focus on transferring knowledge and educating practitioners through practice-based research and to direct the research outcomes for informing policy-makers and other stakeholders about the current state of knowledge on the use of a particular tool, method, or strategy (Wainwright et al., 2018). Wainwright et al. (2018) invite IS and IM scholars to use evidence-based practice for IS (EBIS) as an approach to make their research more relevant to practitioners as well as scholars within the discipline and beyond. We use an EBIS approach in this paper, due to a high level of current interest in practice as well as in academia for understanding and implementing digital transformation in organizations. We therefore use Wainwright et al. (2018)'s recommendation for developing new knowledge about employees' digital literacy through creating a practitioner research culture, conducting empirical research, and undertaking systematic literature reviews (SLRs) and expert inputs. Figure 2 shows our research design. We initially conducted an SLR to understand the current state of knowledge

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on digital literacy and its assessment. Our search in the literature included both quality academic as well as major professional publications; yet it returned only a handful of relevant content about employees' digital literacy for organizational digital transformation. Thus, we further conducted a brainstorming session with professionals and experts to enrich our SLR findings, and to streamline the dissenting views on the neglected topic of digital literacy at the organization level. This approach for combining SLR with experts' inputs has been used previously and recommended for research problems with limited published results (Akter et al., 2019).
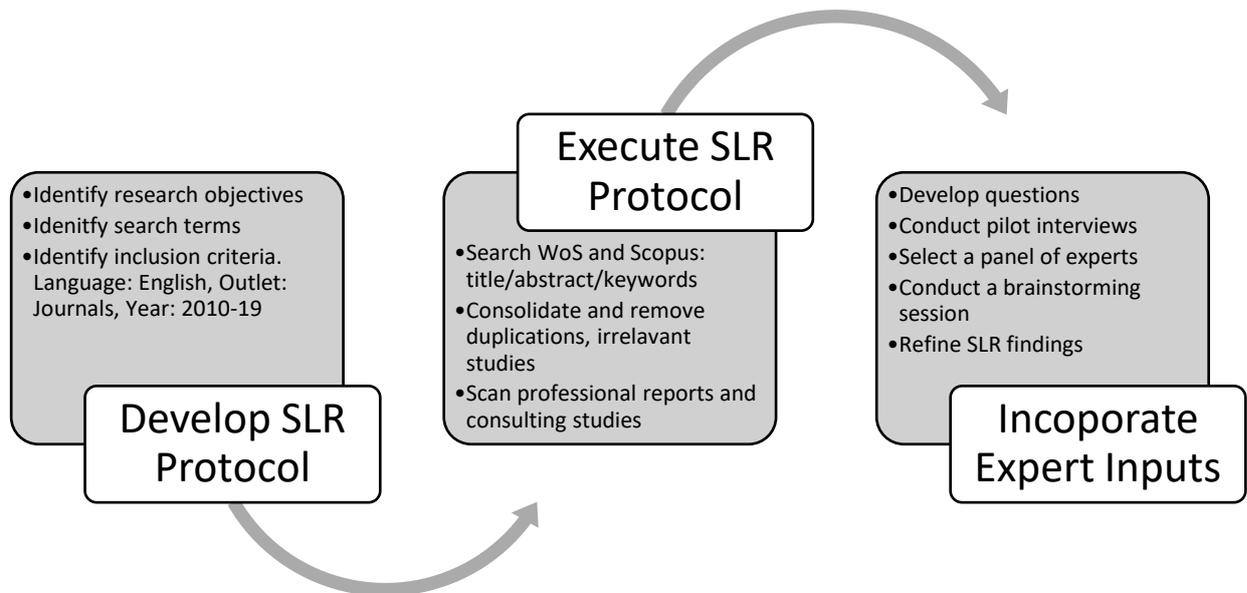

Figure 2: Research design

3.1. Systematic Literature Review (SLR)

The systematic review incorporated both academic research as well as professional reports. As per Figure 2, initially we developed the review protocol in light of our research objectives. We scanned and read some of the most salient articles in the literature in order to determine the search terms. Then, we carried out the search. We used ISI Web of Science (WoS) Core Collection and Scopus databases and conducted the review in the period of September-October 2019. When using the 'topic' field to search the database, the databases return all articles with the search terms in their title, keywords, or abstracts. Scholars in management science consider this database the most comprehensive and use it frequently in systematic reviews (Akter et al. 2019; Kuhl et al., 2019). We focused on journal articles and papers written in English. This means that our sample does not include conferences and books. We limited our search to the period of 2010-19, since the notion of digital transformation for organizations is relatively a recent phenomenon, more than 90% of papers were published in this period.

The search terms were "digital literacy" or "digital transform*" or "digital skills" or "digital competen*" or "digital capabilit*" or "digital employee*". Asterisks helped us to retrieve results for similar versions and alterations of the terms, like competency and competencies. Details are shown in Table 1. Then, we combined the search terms with the constraint that it has to appear in business category, it has to be in English, and it should be a journal article. Finally, we limited research to articles published after 2010 since they have been comprising

more than 90 percent or all articles. In the second step, we dropped duplicated articles and read all returned articles in order to identify false positive results and relevance to digital literacy at organizations. This helped us to restrict papers further (dropping themes around process, supply chain, policy and strategy); and we ended up with a sample size of 23 paper articles in our SLR pool.

Table 1. Initial search results

Search terms	SCOPUS	WoS
"digital literacy" OR "digital transform*" OR "digital skill*" OR "digital competen*" OR "digital capabilit*" OR "digital employee*"	6493	4314
Document Type (Article) AND Subject Area (business, management and accounting) AND Language (English) and Date (after 2010)	345	51
Papers focusing on companies and digital literacy implementation	9	14

We dropped many papers from the search results, since their focus were on the impact of new digital technologies on employment and employability concerns of individual labour (UNESCO, 2011). Many studies in economics show that artificial intelligence, learning machines and software automation applications will affect workers, since commercial robots will increasingly replace them (McAfee and Brynjolfsson, 2014). According to the findings of Acemoglu and Restrepo (2017), one more robot per thousand workers reduces the employment to population ratio by about 0.18-0.34 percentage points and wages by 0.25-0.5 percent. Based on a study of the labour force in 46 countries, McKinsey Global Institute (2017) concludes that almost half of work activities globally have the potential to be automated. That is why literature focuses on questions interested in broad employment/ labour concerns driven with the adoption of digital technologies, such as How will education and skill systems that promotes creativity and enable humans complement machines be developed? How will education systems for the 21st century be modernized? What transition measures will be taken by governments for workers?

Given the limited results returned from academic publications, we decided to expand our research outside academia. As per EBIS guidelines, scholars are encouraged to exchange knowledge with practitioners particularly for topics that experts' insight is informing analysis and interpretation of research findings (Wainwright et al., 2018). Thus, we included a search of major international consultancy companies (including Accenture, Deloitte, Gardner, and McKinsey) that have been active in digital technology field. The majority of digital competency frameworks seem to focus on either digital strategies or customer experiences. In addition to consultancy companies, we searched publications of internationally well-known think thanks: International Institute for Management Development (IMD) and World Economic Forum (WEF), both known for their comparative studies targeted to account a number of critical performances such as competitiveness indexes at national levels. Finally, we searched key global organizations: the United Nations (UN), Organization for Economic Cooperation and Development (OECD), and the European Union (EU) community through their portals. To a large degree, studies carried by these organizations focused on education and employment policies (i.e. UNESCO, 2011 and OECD, 2016). We included seven additional resources to the SLR pool, such as the EU report on "Digital Competence Framework for Citizens (DigComp)" (Vuorikari et al., 2016). In sum, the final SLR pool consisted of 30 articles and reports.

3.2. Experts' Inputs

We designed a protocol for collecting experts' inputs to fuse the findings of SLR with expert views. The use of multiple sources of data can ensure the reliability of the study findings and reduce bias (Akter et al., 2019). Qualitative methods facilitate investigation of how people place meanings on a certain phenomenon, process, structure, or setting (Silverman, 2011). Since qualitative methods allows researchers to capture rich nuances of responses beyond surveys, they are widely used in qualitative studies in order to obtain rich data (Adomavicius et al., 2008).

Initially, as per our research objectives, we developed five questions to be discussed with experts based on our SLR findings (see Appendix for the interview protocol and questions):

i. The first question examined whether our understanding of digital literacy definition from the SLR results made sense to the professionals.

ii. Next, we explored whether the experts agreed on the negligence of digital literacy in the organizational digital transformation practices and initiatives.

iii. Following this, we asked if the notion of affordances in the context of digital literacy made sense to them

iv. We then drew on Yvas et al. (2017), and asked our experts whether a distinction between Individual vs. Organizational affordances with their underlying competencies make sense in the digital literacy context

v. And lastly, we asked for any other comments that experts may wish to share

We carried out three pilot interviews in February 2019 and received feedback from one industry professor and two university directors (one in charge of research centre, one director of data analytics). Attempts were made to illuminate various biases such as interviewees' subjective meanings, actions and social contexts as understood by them. Therefore, the two inquiry elements recommended by Patton (1999) were used throughout the brainstorming session: (i) techniques and protocol for gathering and analysing qualitative data, and (ii) credibility, competence, and perceived trustworthiness of the researcher. Confirmation from the participants was sought about clarification of any issues raised by them during the interviews.

As suggested by Niazi et al. (2006), it is important for exploratory studies, like this study, to make sure a wide range of organizations from different sectors are covered to prevent overrepresentation of one particular sector. Thus, the participating experts in this study were chosen from various industry sectors to ensure various perspectives about employees' digital literacy in organizations are captured. Lastly, the study triangulated the findings of the SLR and qualitative expert inputs. Then, in the last stage, we recommended a digital literacy definition and offered an assessment model for digital literacy based on a multi-dimensional construct.

4. Findings

This section presents findings of the systematic review and the brainstorming session in relation to our research questions. Firstly, we overview the demographic information of the reviewed papers as well as experts participated in the brainstorming session. Next, we answer the first question and review definition of digital literacy as well as instruments used in the literature to measure it. And lastly, we answer questions two and three by proposing a new framework for defining and measuring digital literacy as an organizational affordance.

4.1. Demographics of SLR and experts brainstorming

Our systematic review resulted in a mixed of academic and professional publications as shown in Table 2. While most of the selected papers have been published in academic outlets, professional works have been conducted at national levels to collect data for measuring competitiveness of countries. We found that search on digital literacy over the past years has been on the rise with a peek in 2018 with 15 papers. A quick overview on key findings of papers show that only slightly over half of the papers presented an explicit interest in digital skills and workplace issues. Empirical works are rather not directly related to digital literacy: four out of 13 empirical works are national level competitiveness reports, five of them are specific to digital skills of a certain sector -legal, business service, container terminal, biotech, and health- and the rest talk about digital skills of individual/citizen/student.

Table 2. Demographics of selected studies in SLR

Authors	Country	Theory/ Model	Type of study		Research design			Key findings
			A	P	LR	E	C	
Baller et al., 2016	International	Model		x		x		IT capacities of countries have positive impact on their competitiveness.
Bokek-Cohen, 2018		Theory	x				x	Information literacy of managers increase company performance.
Bolek et al., 2018	Slovenia	Model	x				x	A model showing dimensions of managers' digital literacy.
Chetty et al., 2018		Model	x				x	Digital literacy at individual level could cope with digital divide.
Dery, 2017		Model	x				x	It shows the role of leadership & employee connectedness in employee experience at work.
EC, 2007	EU	Model		x		x		It offers a method to measure digital skills of students.
Faraj et al., 2018		Theory	x				x	Discusses workplace changes and digital requirements.
Gekara & Nguyen, 2018	Australia	Theory	x			x		Examines the transformation in the nature and content of work and the types of skills required by employees working at container terminals.
Gillen, 2018		Model	x				x	A model to assess digital literacies at schools.
Golowko, 2018	Romania	Theory	x			x		Lists soft and hard skills given at job advertisements by business service companies.
Greene et al., 2014	US	Model	x			x		The relationships between regulated learning skills, epistemic cognition and learning are shown.
Hendriks et al., 2018	US	Model	x				x	Showing how customer-facing professionals learn in their interactions with customers.
Hunter, 2018		Model	x				x	Discussion on what are digital skills at legal sector.
IMD, 2017	International	Model		x		x		The report compares countries' digital competitiveness through data at national level.
Jandrić et al, 2018	Europe	Model	x				x	It offers a conceptual model for assessing digital skills of employees.
JISC, 2018	UK	Model		x			x	It assesses digital literacy of individuals at higher education.
Lavrynenko et al., 2018	USA, UK, Russia	Model	x			x		Job advertisements used to list biotech skills in hard, digital and soft categories.
Limaye et al., 2015	India	Model	x			x		It introduces a project designing a course for E-learning in health

Reference	Country	Type						Description
								sector.
Littlejohn et al., 2012		Theory	x		x			A through work on learning and digital literacies.
Liu et al., 2011	UK	Theory	x			x		It discusses implementation problems for digital transformation projects in banking industry.
Martin, 2005	EU	Model	x			x		A detailed model for digital literacy assessment at individual level.
Murawski et al., 2017		Theory	x				x	It calls for studies on digital competences of employees to fulfil needs of digital workplace.
Nedungadi et al., 2018	India	Model	x					It introduces a digital literacy program for low-literate learners in remote settings.
OECD, 2016		Theory		x			x	It shows how digital skills needed for economic growth
Santoso et al., 2019	Indonesia	Model	x			x		Employee-related factors (creative self-efficacy and transformational leadership) moderates the relationship between innovative work and employee performance.
Stordy, 2015		Theory	x		x			It gives a detailed account of different definitions of digital literacy in literature.
UNESCO, 2011	International	Model		x				It offers the integration of digital literacy to education policies.
Vuorikari et al., 2016	EU	Model		x	x	x		A sophistical model for individual/citizen level assessments of digital competence.
Weill et al., 2019	US	Model	x			x		Having digitally savvy managers influence company success.
Westerman, G., 2016		Theory	x				x	People aspect of digital transformations is critical for their success.

Next, we conducted the brainstorming session on the 8th of March 2019. The attendees of the session were practitioners at various executive positions in different companies (Table 3). These experts were executive level students enrolled at Master for Business and Technology offered at University of Technology Sydney. All attendees joined the brainstorming on a voluntary basis and all experts were assured of confidentiality. Within one hour, we discussed four questions and recorded the responses that were transcribed into text with a Sonix software (Drever, 1995).

Table 3. A Demographic analysis of the experts that joined the brainstorming session

Demographic characteristic	Sub-level	Count n= 11 (%)
Gender	Male	9 (82%)
	Female	2 (18%)
Profession	Business architect	2 (18%)
	Director of information	1 (%9)
	System analyst	4 (36%)
	Data and information manager	1 (9%)
	Information manager	1 (9%)
	Service manager	2 (18%)
Education	Undergraduate	11 (100%)
Age	25-35	2 (18%)
	35-45	7 (64%)

	45-	2 (18%)

4.2. Definition of digital literacy

Stordy's study (2015) of literacy and digital technologies have analysed 685 articles and books published in the period of 2012-15. Apparently, the term literacy ranges from people's ability to decode and encode text from to considering reading and writing as a meaning-making activity (Gurak, 2001). Although individuals and organisations use identical terms to label "their" conception of literacy, they can differ markedly in emphasis and scope (Stordy, 2015). For example, one study considers digital literacy as the skills and competencies required by the ICT industry to satisfy the need for a technical literate workforce (Gillen and Barton, 2010). In other words, it encapsulates the skills and competences necessary to use computers and software packages. It seems the European Commission's vision of an e-Europe initially follows this definition and later expanded to include media literacy (European Commission, 2007). UNESCO adopts another definition; it uses the term "media and information literacy" to combine media literacy, information literacy, news literacy, television literacy, film literacy, computer literacy, internet literacy, digital literacy and social media literacy (UNESCO, 2013).

In some cases, different terms have been used for the same sets of competencies. For example, "Information and data literacy" is a term used in the EU's DigComp study, which aims to measure digital competences across European countries in order to improve citizen's digital competence for work and employability, learning, leisure, consumption and participation in society (Vuorikari et al., 2016). To complicate things further, recently some studies use sector specific definition of digital literacy. For example, digital or eHealth literacy refers to the ability to seek, find, comprehend, and evaluate health information from digital resources and then apply this information to solve a health problem (Limaye et al., 2015).

As the study of Belfiore et al. (2004) challenges traditional thinking about workplace literacy as functional skills, it is critical to understand literacy practices embedded in culture, knowledge, and action (Bandura, 1977; Belshaw, 2011; Martin, 2005; Stordy, 2015). That is why our study starts exploring digital literacy by adopting Stordy's definition (p.475): "The abilities a person or social group draws upon when interacting with digital technologies to derive or produce meaning, and the social, learning and work-related practices that these abilities are applied to."

When we presented Stordy's definition to experts in brainstorming session and asked them whether they agreed or disagreed with this definition, we found out that the majority of experts, except for one of them, were in agreement with this definition. The expert who did not agree discussed that "*digital literacy should be more of an ability to use technology in solving problems / performing tasks*". In fact, the expert's emphasis on an ability used to perform a task or solve a problem is in line with our idea of abilities applied to work-related practices. Instead of implicit definition, we decided to expand our definition to accommodate a practice-oriented view.

With respect to interactions of employees as a social practice, few experts particularly emphasized its learning aspect. An expert puts it in the following way: "*As technology changes the concept and abilities of employee improves to stay ahead of the curve. Thus,*

digital literacy should be restated as employees learn on the job". Two companies are given as examples of learning environment: "*Google represents ways of communicating in a work & social environment. In the same manner, think Apple, it is a company of communication, learning, monitoring, data gathering*." Other expert talks about appetite for learning to become more literate in digital technologies: "*Governed by employee interest, which is governed by their appetitive for affordance*."

In sum, our redefined version of digital literacy, driven from the affordance theory, reads as follows:

> "*Digital literacy is an organizational affordance and consists of abilities of employees in utilizing digital technologies in work-related practices.*"

4.3. Digital literacy assessment

None of the academic papers resulted from our literature review provided a particular instrument to assess digital literacy at the organizational level. Only one study, Chetty et al. (2018), is specifically interested in developing a general assessment of digital literacy across countries. However, this specific study does not offer any indicator except a conceptual approach about how to build an index to assess digital literacy for G20 countries. It proposes a composite digital literacy index where digital skills are made of five different skill sets: information literacy, computer literacy, media literacy, communication literacy and technology literacy. In addition, it foresees that each learner should use a particular tool by considering three perspectives: Cognitive, Technical and Ethical. For example, it argues, "The evaluation and synthesis of multiple streams of information falls within the cognitive perspective. Effectiveness at synthesis and evaluation will enable the production of new content, which is the technical view. From the ethical perspective, the ability to evaluate content also supports the understanding of what constitutes the appropriate usage of such content, including issues of copyright and intellectual property protections" (Chetty et al. 2018: p11). However, that particular study does not present any assessment metric other than categories where metrics need to be developed. Further, this study calls for researchers to develop an index of digital literacy skills that could be similar to the OECD's Survey of Adult Skills.

Another study, Bertschek et al., (2018), measures digital transformations in Germany, by assessing firm level adoption of ICT but it does not consider skills related to the adoption of these technologies. The remaining studies are interested in firm level measurements in specific industries, while their skill sets are too broad. For example, the study of Lavrynenko et al. (2018) classifies the comprehensive lists of biotech skills into hard, digital and soft categories where digital skills are limited to software related skills such as being able to use the software called Matlab. Liu et al. (2011) provides a framework for considering capabilities that will fit with digital transformations in banks but it does not go into any details of skills or capabilities, rather points out the importance of human capital aligning with internal and external changes.

A few empirical studies examine job advertisements to find out what organizations in a specific industry need as digital skills. For example, Golowko (2018) examines the Romanian business service industry and finds out that organizations demand for hard skills such as languages and IT skills such as Office Suits, Development Environments as well as higher demand for soft skills especially analysis and problem solving induced by digitalization. Another study (Limaye et al., 2015) focuses on employees of health sector and offers a framework to build a tool so that employees could develop their ability to seek, find, comprehend, and evaluate health information from digital resources. Another one (Hunter,

2018) attempts to understand the digital literacy needs for professionals working in law consultancy companies and for example it finds out that cyber security and search abilities to avoid information overload.

Three internationally well-known indexes (Baller et al., 2016; IMD, 2018; Vuorikari et al. 2016) target to understand the national capacities for digital skills from the perspective of digital economy. That is why they have a limited understanding of digital literacy. For example, WEF's Networked Readiness Index (Baller et al., 2016) encompasses a skills dimension with four indicators related to the capacity of the population to make effective use of ICTs: the enrolment rate in secondary education; the overall quality of mathematics education; the overall quality of science education; and the adult literacy rate.

4.4. Employees' digital literacy as organizational affordances: A conceptual framework for its definition and assessment

Drawing from the affordance theory, we pose that digital literacy as an affordance acts as a mediator in organizations' digital transformation. It offers, and at the same time constrains, action possibilities and opportunities to use the properties of a technology that are inscribed by the designers. However, it is a social product of human actions, as through interaction with digital technologies, users not only develop new understanding of what the technology is and how to use it as but more importantly they could articulate when and why to use it.

Thus, a conceptual framework for this research relies on the assessment of digital literacy through the complementary nature of literacy as a cognitive ability and a social practice (Bandura, 1977; Street, 1984: Dorby, 2015; Yvas et al., 2016). Here, we draw on and extend affordance theory as per Yvas et al. (2006 & 2016) and make an analogy with two types of affordances: affordance in information and affordance in articulation. In other words, the framework is based on two pillars as shown in Figure 3. Affordance in information refers to users' understanding of a technology, while affordance in articulation refers to users' interpretations about the use of the technology, which is a highly situated notion that emerges over time and derivative of social interactions in a specific context.

Organizational Level: Affordance in Articulation

Digital Integration: the range of digital relevant practices and processes in an organization's daily operations as well as their inter-relationships both internally and externally

Cognitive ability   Social practice

Individual Level: Affordance in Information

Digital Competency: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving
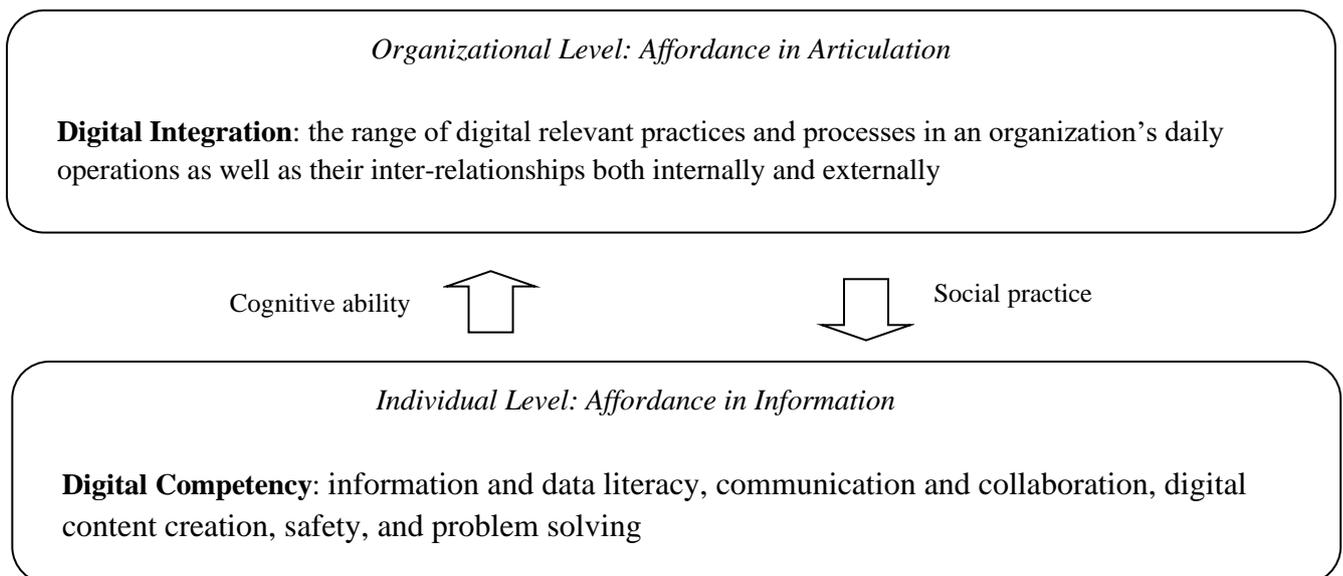
Figure 3. Digital Literacy as an organizational affordance

The affordance in information takes place at the individual level, since employee(s) uses and adapts to the digital technology and continuously form and re-form certain affordances based on their cognitive abilities to perceive and realize an opportunity not to the availability of opportunity in the environment. Thus, the assessment of this pillar might be carried out by digital competence, following the EU's DigiComp framework (Vuorikari et al. 2016). This study offers an assessment of individual competences at five levels: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. EU's website shows how widely this assessment model is implemented for different purposes. For example, it can help gap identification, and development of training and education programs. In fact, ECDL Foundation (see http://www.ecdl.org/), an international organization dedicated to raising digital competence standards in the workforce, delivered training programs in more than 40 languages worldwide that cover competences outlined in DigComp.

In the brainstorming session, all experts agreed that an affordance lens to digital literacy makes sense and can offer value insight into the interactions between employees and organization at different organizational level as well as interactions between employees and the technology in use. Also, all experts agreed with these individual level assessments. One expert pointed out to account for different levels of adaptability and rate of learning at individual level. Another expert suggests considering "*the employee's existing level of digital literacy.*" Further, an interesting idea emerged from the discussion of experts: generation factor. One expert proposes to pay attention to generational differences while assessing the digital literacy of employees with the following example: "*the older generation that didn't grow up with digital everywhere right from the start. It's obviously going to be more of a struggle for them to adapt to stuff. Whereas the young generation that have grown up with smart phones and everything will just take it in their stride and don't really even regard it probably is a transformation at all.*" Another expert gave an example: "*I don't think anyone has started to think the little old lady down at a retail shop who serves me on the cash register. She's now got to deal with a cash register. That's a full-on computer and I now give her my phone to pay rather than a card or gas. No one's actually thought about that from the point of view of the little old lady who's trying to have everything be digitally literate.*"

The affordance in articulation pillar, in other words, social practice pillar, indicates the use of digital technologies by employee(s) as a member of group. Considering that affordances depend on the way they are perceived by the users' knowledge, skills, experience and culture, the repeated and ongoing interaction of users as a group with a technology determines the production of structures of technology use, the so-called "technology-in-practice" (Orlikowski, 2000). Dealing with social character of literacy demands on an organizational level assessment into the digital literacy assessment.

In this paper, we would like to focus on social contexts within which IS operate in order to observe the social character of literacy. Anderson and Robey (2017) considers social context as "'work practices', the recurring activities through which individual and groups direct their work-related efforts" (p.101). That is why, we offer digital integration as a potential assessment dimension to capture the affordances taking place at the organizational level. Digital integration shows the range of digital relevant practices and processes in an organization's daily operations as well as their inter-relationships both internally and externally (Du et al., 2019). The degree of digital relevant practices and processes are applied by the company could be evaluated through the use of proxies such as the firm-level digital technology absorption available in IMD (2018) and WEF (Baller et al., 2016). Accordingly,

we assert that the articulation affordances accumulate over time through employees' interactions with each other through digital relevant practices and processes imposed on them. Its assessment might rely on data such as on the following metrics used to measure digital integration at the national level by aggregating firm level data (IMD, 2018): firm-level digital technology absorption, the capacity for innovation, ICT use for business-to-business transactions, ICT use for business-to-consumer, Internet use, the capacity for new technologies, and the capacity of management and staff to innovate. The higher digital integration in an organization indicate higher capacities fpr articulation affordances.

When we opened up this organizational level metric as a way to assess digital literacy of employees at organizations to our experts, we received an aggregated endorsement from them. One expert points out that "*I think if you don't have the clear digital literacy within your organization, it's going to be hard to integrate digital.*" Another expert undermines the risk of inefficiency: "*Organizations assume that employees will take actions to improve their digital literacy. But the ability to make sense of technology is going to come down to how does this affect me do my job. My job is to serve customers. I'm not going to care about how well I understand the technology. Just how do I do my job?*" Only one expert was unsure whether the instrument makes life complicated since digital integration could happen either at an employee's task level or it might be a system change at organizational level.

Before proceeding further, we need to make a note that this paper keeps organizational and individual level assessments as separate affordances. However, in reality, there are many interactions take place between these two levels as indicated in Figure 3. These interactions might consider many aspects of both knowledge management such as knowledge sharing and human resources management such as work engagement (Santoso et al., 2019; Strong et al., 2014). In order to keep the framework simple, we prefer to confine our study to tackle each level separately, however the future studies should consider the role of business processes and organizational culture on these interactions between information and articulation affordances.

5. Discussion

5.1. Primary takeaways
Our SLR clearly indicates a lack of studies on the relationship between employee and digital transformation. While research has already established the importance of employees in digital transformation (Warner & Wäger, 2019), digital literacy of employees and its underlying concepts have not been elaborated. Our paper contributes to the IS literature by proposing a workable definition for the digital literacy at both the individual and organizational levels based on the affordance theory. By doing so, we aim to enrich IS studies attempting to explain how and why digital technologies are used in different ways and result in different outcomes in different organizations.

As Yvas et al. (2006) argue, users actively interpret the situation and make sense of the technology while being involved in certain work practices / activities. During the user-technology interaction, users'/employees' 'active interpretation' results in the emergence of affordance that is socially and culturally determined. By focusing on this dynamic interaction, our paper responds to a set of recent studies inviting scholars to prove the usefulness of the affordance concept in understanding the empirical processes through which affordances of technology come into existence in unique situations (Faraj & Azad, 2012: 255; Hauge, 2018; Yvas et al., 2017). This paper introduces the concept of digital literacy of employees as a

combination of information and articulation affordances practices in organizational contexts. By doing so, we highlight digital literacy as a key factor within organizational boundaries for its digital transformation (Haeckel, 2013; Jarrati & Thomson, 2017; Matt et al., 2015; Vial, 2019; Warner & Wäger, 2019).

Affordances theory helps to expand the traditional perception of literacy as a cognitive ability residing inside people's heads independent of the context by welcoming literacy as a social practice (Anderson & Robey, 2017). However, more importantly, the theory helps us to see the potentiality to perform a new function or perform existing functions more efficiently with digital technologies in companies. What those new functions are, however, may not be immediately obvious since an affordance might not be a characteristic of a particular technology. During the user-technology interaction, employees' active interpretation results in the emergence of affordance that is shaped with corporate culture and social interactions with other employees or team members. In other words, digitally literate employees develop new understanding of what the technology is, how to use it, when to use it, and why to use it. This will improve the effectiveness of the digital transformation in organizations.

The new definition presented in this paper allows us to consider what these abilities in utilizing digital technologies in work-related practices might be. Again, relying on our triangulating multiple sources of data, we offer two sets of abilities to define digital literacy of employees: cognitive abilities / competencies develop information affordances while social practices contribute to articulation affordances. Together these affordances supply a wide range of potentialities to perform a new function or improve existing functions. Therefore, a focus on digital literacy as an organizational affordance might improve managing digital transformations.

Drawing on affordance theory, digital literacy of employees could improve the use of digital technologies, since employees develop not only skills to utilize them but also through interactions increase their understanding of technology opportunities available to act upon. Hence, this ability of employees could become a critical capability in the process of digital transformations. As a number of recent studies point out (Dery et al., 2017, Livingstone, 2016; Weill et al., 2019), there is a need to have collective 'digital literacy' at company boards and executive teams in order to face challenges of digital disruption of industries and organisations. The threat is even more real for employees as clearly observed in many studies examining future of workforce (Murawski & Bick, 2017).

Therefore, specifically, our contributions to theory are twofold: first, we offer a conceptualization of digital literacy to draw attention to the role of employee in digital transformation, and second, we develop a preliminary framework that guides an assessment of digital literacy as an organizational affordance. Based on our work, we expand the discussions on digital transformations to rethink digital literacy as the employee involvement in digitalization. Filling the gap on measuring digital literacy at the organizational level, we provide insights for managers of different levels and functions, concerning how individuals can contribute to realising the potential of technological changes (Vial, 2019; Warner & Wäger, 2019) by articulating a model of the various competencies (i.e. skills and abilities) required for the execution of digital transformations. Although the research is conceptual, it brings forward a new look for the role of employees in the implementation of digital technologies.

5.2. Implications for practice

The 'emergent' and 'dynamic' nature of affordances lead to a constantly changing relationship between employees (user) and the digital technology (artefact) (Anderson & Robey, 2017). During the digital transformation of an organization, as new technologies maybe introduced and existing ones may change or disappear, employees learn and adapt their behavior through interactions with other employees as well as with the technology. Thus, a successful digital transformation requires a good understanding of this relationship for the design, use, and change of digital technologies.

Central to affordance theory is the situated actions of users where technology use emerge in practice (Yvas et al., 2017). This means that employees' interpretations and use of digital technologies can be different to what the designer of the technology initially prescribed. A key implication of this for managers is that the use of digital technologies by employees, as part of the digital transformation journey, is not solely a factor depending on the individuals, rather it depends on the culture within which the use of digital technologies evolve. The underlying affordances for the organization and for the individual employees as per our proposed framework can be helpful to establish better expectations and reflection on technology use and improvements. Any changes in digital technology design, use and implementation needs to be done with consideration of the culture within which the organization is operating, noting that as users' behaviour changes over time, technology use changes as well. Hence not only the information affordances but also articulation affordances contribute to the actualization of technological opportunities in organizations.

Another implication of digital literacy as an organization affordance is employees' interpretations and responses to changes in social and cultural norms that digital technologies may enforce when they are being used or when their use is being changed in the organization. The change in norms maybe implicit or explicit, depending on whether managers or decision makers intentionally or unintentionally introduce new technologies or make changes to existing technologies. Subsequently, employees, through their 'active interpretations', may choose to comply with new norms and adapt them for undertaking their tasks, or reject them. Employees' response or choice will then trigger managers' subsequent actions, which will impact design and use of digital technologies and the digital transformation process as a whole. That is why understanding the role of employees in adoption of digital technologies through their digital literacy could further expand our understanding of how to align the dynamic relationship between employees with technologies.

5.3. Limitations and future research

The study has four major limitations that could prompt future research. First, the paper is a conceptual framework that needs to be put into test through empirical work. This requires the development of a set of assessment constructs to quantify digital literacy and then put into test. In terms of empirical work, the assessment of the levels of digital literacy could be carried out for different sectors. Observing micro-level factors such as sectors could enrich our understanding of how digital literacy operates under different contextual environments. Second, expert opinions have directed how digital literacy might change depending on rank, age, and function. The concern one employee characteristics has been a topic of interest in IS literature too (Jarrahi & Eshraghi, 2019; Ng, 2012). Hence, individual characteristics might be integrated to the investigation of digital literacy at empirical studies.

Third, the study narrows its observations to one general purpose technology, namely digital technologies, omitting how the particularities of each individual digital technology might

affect digital literacy. In fact, a recent study has analyzed affordance actualization of blockchain through business processes at a financial company (Du et al., 2019). Future studies could try to investigate one technology as well as a number of technologies in order to compare and show how the number and/or qualities of technologies might influence affordances at individual and firm level.

Forth, the study is one of early attempts to apply affordance theory on digital literacy at organizational level by not limiting the concept to individual level by treating each level separately in our conceptual framework. However, our study does not offer an understanding of the complexities taking place between these two levels. It seems the literature is also silent on the interactions that might become effective in shaping individual and organizational level actualizations (Strong et al., 2014). Future studies could develop this initial framework to integrate interaction factors that might advance our understanding digital literacy as affordances.

In addition to the above, future research is encouraged to take into the consideration the effect of major outbreaks such as COVID-19 on organizational digital transformation and digital literacy of employees. From an organizational affordance perspective, users actively interpret the situation such as the pandemic and the new work environment and make sense of the technology while being involved in certain work practices / activities such as a long period of working from home. Mass adoption of new digital technologies (e.g. online meeting platforms) by employees has become a vital business change since the outbreak of the virus (Savić, 2020). The fast adoption of these technologies appears to reinforce our findings that digital literacy is social practice and context specific, where employees' cognitive abilities develop information affordances as they emerge during the pandemic while social practices contribute to articulation affordances and help employees to adjust to the new working model. The extraordinary impact of COVID-12 on sudden demand for the transformation of work environment and the subsequent need for workforce upskilling has opened new doors for more opportunities into studying digital literacy from an organizational affordance perspective. For instance, Sipior (2020) stress that while almost everyone in the world has been impacted by the pandemic, this has created an opportunity for information systems and other professionals in shaping post COVID-19 transformation in organizations, individuals and societies. The above author argues that digital technologies such as artificial intelligence and big data analytics will play a big role in dealing with disruptions caused by the pandemic, which requires uplifting employees' skills and literacy. Sein (2020) stresses that the Covid-19 outbreak has created a rare opportunity to reconsider some fundamental aspects of information systems research and practice and argues that the pandemic has significantly impacted work practices, how organizations manage information and design of technologies. Thus, new opportunities have emerged for scholars to examine digital literacy from an organizational affordance lens can prepare organizations and employees to effectively respond to major disruptions, manage its impacts, and continuous to innovate and create value.

6. Conclusions

Considering the importance of employees in digital transformation, this paper explored digital literacy of employees and its underlying concepts. This study contributes to the IS literature in two ways. Firstly, we proposed a definition for the digital literacy at both the individual and organizational levels based on the affordance theory. The affordance theory expanded existing understanding of digital literacy as an individual factor and conceptualized

how cognitive abilities / competencies develop information affordances while social practices contribute to articulation affordances. Secondly, this paper developed a preliminary framework that guides an assessment of digital literacy as an organizational affordance. While the first contribution expands the discussions on digital transformations to rethink digital literacy as the employee involvement in digitalization, the second one fills the gap on measuring digital literacy at the organizational level, showing how various competencies (i.e. skills and abilities) required for the execution of digital transformations.

Digital literacy concept developed in this paper shows not only interactions between employee-technology but also employee-employee through their practice during digital transformation. Challenges for digital literacy are numerous including its assessment and integration into a number of enterprise systems including human resources management. However, once these challenges are resolved, digitally literate employees could bring many benefits in digital transformation projects. In particular, digitally literate employees could not only understand what the technology is and how to use it but also, they could particularly get good grasp of when and why to use the technology. Considering the future of work might take place at home, it is especially crucial to increase the utilization of digital technologies across the organization as well as to improve the effectiveness of employee experiences.

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Appendix: Interview Protocol and Questions

We study digital literacy as a competency set that could shed light on the relationship between employee and digital transformations. Digital technologies trigger a broad range of organizational changes that introduces new challenges for an effective management of employees among other things. Developing the level of digital literacy in a company could help managers to increase not only the utilization of digital technologies by employees but also the effectiveness of employee experiences that result in improvement of the productivity, employee engagement and retention of employees.

As a result of the systematic literature review conducted during this research the following assessments were found. We would like to receive your insights to find out if these findings make sense based on your experience. Your responses will be kept anonymous.

If you join to our work, we will be grateful. We are more than happy to send our final work after completing it.

> Digital transformation is the umbrella term referring to the change in an organisation`s structure, processes, functions, and business models due to the adoption of digital technologies such as artificial intelligence for radically improving its performance (Matt et al. 2015; Sahu et al. 2018).

QUESTION 1: We refer to the following definition for digital literacy at the organizational level. Do you agree or disagree with this definition? Can you please elaborate?

> Digital literacy refers to the abilities a person or social group draws upon when interacting with digital technologies to derive or produce meaning, and the social, learning and work-related practices that these abilities are applied to (Dordy's, 2015).

QUESTION 2: The relationship between employee and digital transformation has been so far highly neglected in the academic and professional literature. So, what do you think about this negligence? In what way employees' digital literacy may be important for digital transformation of organizations?

QUESTION 3: We pose that digital literacy of employees is a fluid and constantly changing concept. As employees actively interpret their situation in the organization and make sense of the technology while being involved in certain activities. During the user-technology interaction, an employee's active interpretation results in the emergence of affordance that is socially and culturally determined.
Does this proposition make sense to you? Please elaborate

QUESTION 4: Following the above proposition, we found that employees' digital literacy can be described in two levels: Individual, and Organizational. Considering this, please comment whether the following propositions make sense:
4.1. We describe the individual level through employees' five digital competencies: (i) Information and data literacy, (ii) Communication and collaboration , (iii) Digital content creation, (iv) Safety, (v) Problem solving.
4.2. We describe the organizations level through (i) Absorptive capacity, (iii) Business Agility, and (iii) Digital Integration as per following corresponding description:

- Absorptive capacity of employees contribute to the readiness of organization for future, since the absorptive capability refers to learning attitudes, willingness as well as capability of employees to participate in digital-related processes. Hence, this capability shows the attitude of the organization to learning, being explorative, exploitative or transformative.
- Business agility not only refers to the speed at which organizations change, but also in their effective use of available resources in order to assume a suitable response to transformations and maximize the benefits from new opportunities.
- Digital integration reflects itself in the way an organization implements digital relevant practices and processes in its daily operations and relationships both internally and externally.

QUESTION 5: What other comments do you have in regards to how employees' digital literacy may develop in the future in light of organizations' digital transformation?