

Structuring Digital Options towards reducing the Struggle of Finding the Needle in the Digital Haystack

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Abstract. Employees are confronted with more and more different kinds of digital support in their workplace. However, not every support of such kind is perceived positively, but there are also downsides related to the increase of information and knowledge requirements that come along with it. Hence, employees are often overstrained, but differences and interdependencies between different kinds of digital options have to be considered. In this position paper, we propose a framework to categorize digital options in the workplace and call for further research regarding the analysis of downsides of these options from a knowledge perspective.

Keywords: digital options, workplace, information overload, digitalization, downsides

1 Introduction

With the increase of digital options that are used in the workplace, knowledge is not only required regarding the execution of tasks but also regarding the systems used [1]. Digital options in this paper refer to any kind of system that can support the execution of business processes in workplaces of employees. The main advantage of digital options in the workplace is to provide more information, in a faster and ubiquitous way [2]. As a consequence, more information is provided to employees in the same time period. While this provision of information is potentially reducing the uncertainty of decisions in daily work execution, employees have a limited ability to take cognitive load [3]. Thus, information overload can occur, employees will be stressed and have to spend more time in finding the needed information needle in the haystack [4]. At the same time, more knowledge is required to use the different kinds of digital systems. Prior research has considered specific types of digital options separately thereby focusing on either knowledge gaps [e.g. 5] or information overload [e.g. 6]. We argue that

this approach is insufficient as it underestimates the complexity behind the simultaneous use of digital options by employees. Consequently, the main aim of this paper is to focus on the downsides of digital options for employees taking a knowledge perspective. In doing so, we pick up the call for action [7] on the long-term societal effects of “datification” because the implications of digitalization for individuals and society cannot be estimated at this time. A first step to achieve this goal is to systemize digital options in the workplace from a knowledge perspective to allow for a systematic analysis of downsides separately as well as their interdependencies. Our framework contributes to the literature by providing a business process perspective regarding the structuring of digital options.

2 The need for a look on downsides of digital options from a knowledge perspective

2.1 Knowledge and information of digital options

Having a strategic and systematic approach to knowledge management (KM) is considered critical for organizations in order to address present and future business challenges [8, 9]. Consequently, KM strategies are used to help companies in determining “what to do” with their knowledge to reach their objectives [10].

Thanks to the ICT advancements, it is easier than ever to manage and access knowledge ubiquitously, and most individuals (and organizations) do it. IT-supported KM systems are considered to take a key role in KM [11], the use of these systems, however, must be regarded as a means, not an end [12].

A critical aspect of KM is the continued development of new knowledge and the updating of existent knowledge to take account of the fact that knowledge is in a constant state of change [13]. In connection with digital options, this means that organizations are asked to determine their current understanding and knowledge about the variety of digital options and their operational possibilities. It is most likely that the organizations will discover that there is a knowledge gap [14], i.e. a mismatch between what an organization must know, and what it actually does know about digital options. As a consequence, the organizations would need to identify and initiate proper measures to reduce this knowledge gap.

In addition, the increased use of digital options also requires organizations to reconsider their approach to KM in order to adequately deal with the age of digitalization. In turn, this will also require a review of their knowledge strategies.

2.2 Employees capabilities in dealing with new information

In a workplace that is increasingly characterized by the availability of digital options, organizations need to invest both in expertise and skills as well as software and people recruitment in general to master these challenges [15]. The problem is even more evident as employees have to deal with the different types of digital options (see 2.1) simultaneously. For ensuring that the employees will be in a position to deal with the new information and knowledge provided by the digital options, an emphasis should be put

on developing their absorptive capacities to make sure that they are not overstrained. As a consequence, employees are often not able or not willing to take advantage of the possibilities of digital options. Here, cognitive load of employees plays an important role, i.e. their ability to cope with the new information and knowledge [3]. If the new information exceeds an employees' working memory, information overload occurs which often leads to frustration, reduced efficiency or even negative feelings [16].

Additionally, organizations need to develop resilience to exploit and explore opportunities provided by changes in the business environment, the age of digitalization can definitively be attributed to it. According to [17], resilience is the ability to maintain the functionality of a system when it is perturbed or the ability to maintain the elements required to renew or reorganize if a disturbance alters the structure or function of a system. Employees struggle when being confronted with new digital options and thus feel exhausted as they have to remain productive in their workplace at the same time.

Developing and strengthening the knowledge base is expected to play a major role. However, [18] found that there are large gaps between the stated importance of business technology and in having the right skills, knowledge, and experience within boards to effectively use information and govern enterprise business technology. As a consequence, the responsibility of this topic may be delegated to the IT department which overemphasizes the technical side. As we know, however, it is not about technology alone, but also about the people using the technology [19] and understanding the technology's contribution to carrying out the activities. Consequently, a strategic approach is needed, i.e. one that takes into account the possible downsides of applying new technology (i.e. digital options) as well in order to avoid stress among employees and thus reduce their willingness of adoption [20].

Prior research has addressed parts of the described downsides but focused more on single aspects of skills that have to be learned [e.g. 1], knowledge after introducing a new system [e.g. 5] or information overload [e.g. 6] regarding specific digital options.

3 Framework for structuring digital options in the workplace

3.1 Foundations

Workplaces of employees are embedded in the business processes of an organization [21]. Business processes span across the different functions employees are working in. As such, employees are connected with other employees to manufacture products or deliver services offered by an organization [22]. The work to be conducted by employees can be supported by digital options, i.e. different types of software with the aim to facilitate work [23]. There are many types of software in the market, which can be classified into different categories from a process perspective. The basic separations can be made between customer orders [production level, 24] and information [information level, 25], between function- and process-focus [26] as well as between internal and external actors (i.e. customers and suppliers) [customers and suppliers; 27].

3.2 Framework

Figure 1 presents our proposed framework to classify digital options from a knowledge perspective.

Starting the view on the digital support of activities in a company, the focus is on handling customer orders in activities. First, there is standard software (e.g. Word, Excel) that provides support for a single activity an employee is working on. Second, there can be specific software (e.g. digital applications for machines) that supports a single activity which however requires a deeper knowledge. Third, widening the perspective, the whole process in an organization can be supported with a process-aware information system (typically a workflow management system) that allows to administrate, to control and to make customer orders transparent. Fourth, systems regarding the management of customer orders can be extended to connect customers digitally as well, e.g. order placement in an online system). Fifth, suppliers can be connected digitally, e.g. integration into procurement software. Sixth, employees can be connected with each other that can be for example a companywide chat software. Seventh, from an information perspective, information used to process orders in the process can be provided digitally like using a document management system. Eighth, systems that provide analytical information on the process that covers access (detailed information on processing), reporting (standard efficiency reports) and analytics (statistical analysis, simulation) can be used.

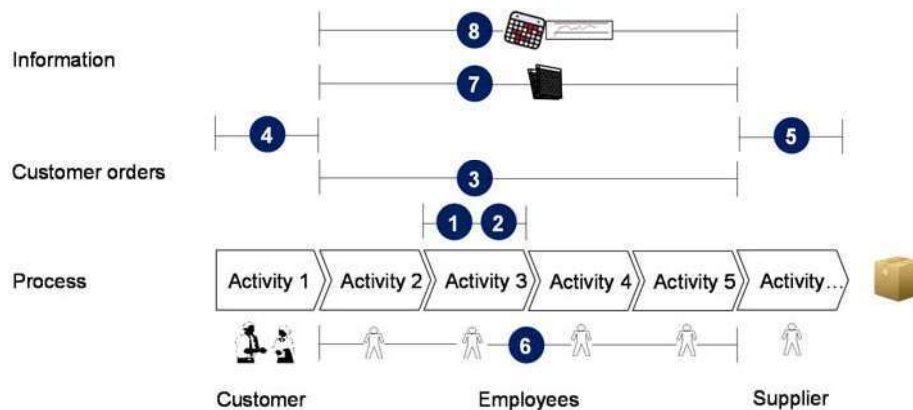


Fig. 1. Framework for structuring digital options in the workplace

3.3 Application to practice

Managers can use the framework to structure digital options that are available in a process. The process should ideally cover the whole value chain regarding a product, but it can also be applied to parts of such a process. Once a process is selected, digital options that are available in supporting the process have to be gathered. This can be done using an IT map or questioning employees as well as supervisors who work in the process. However, gathering data from employees is supposed to be more reliable as often digital options are intended to be used but might not be used by employees when

performing their activities. It can then be determined for each employee in the process, which digital options are used. Such data could be enriched with usage frequency and intensity to calculate a score of digital options usage intensity for employees. Potential downsides can then be analyzed by linking such data with efficiency, productivity, cognitive load, stress or satisfaction within the process or for each employee. Knowing the digital options used would allow to draw conclusions on which digital option or which combination of digital options is leading to which effect on the dependent measures.

4 Call for further research

Since the topic is complex and the related research is still in its infancy, our understanding of the downsides of adopting digital options and specifically the consequences of doing so is underdeveloped from a knowledge perspective. Given the importance of the topic, more research is needed to better understand the likely potential of applying digital options for both employees and organizations. The research propositions are derived from an efficiency perspective, i.e. they cover the dimensions that are relevant when supporting process efficiency in the workplace [28, 29].

First, according to the process perspective in the workplace, we propose to not only consider one information system or one type of digital option when assessing the downsides regarding the knowledge perspective. It would be important to analyze the interdependencies of information systems with regard to individual knowledge and the related cognitive load.

Second, it would be important to determine the importance of digital options with regard to an individual knowledge challenge when executing processes. Here, it should be analyzed which digital options cause problems, how they could be tackled and which can be neglected from a productivity perspective.

Third, it should be analyzed which knowledge gaps exist regarding the different types of digital options and their scope of application in the workplace. This includes an analysis of an employee's degree of freedom, i.e. whether he is provided with detailed guidelines for application possibilities or can choose how to use a digital option himself.

Fourth, cost-benefits of digital options should be addressed by analyzing the trade-off between the employee efforts of gaining knowledge of a digital option and the increase in productivity.

Finally, the execution of a conjoint analysis of knowledge gaps and information overload from an employee perspective would be beneficial. Such an analysis should take the different types of digital options into account and thus reduce the rather narrow view that has been adopted by prior research and thus failed to take the existing complexity into account.

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