

Are Technologies Useful and Easy to Use: Results of A Cross-Sectional Survey

Adinet Lock

LIGS University and Cipher HCC



Corresponding author's e-mail: cipherhcc@gmail.com

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ABSTRACT

Tools and technologies have strengths and weaknesses and can either reduce or increase complexity and make work easier or harder. This article aims to report the results of a survey that assessed the usefulness and ease of use of tools and technologies, and perceptions of participants about tools and technologies as a factor in complexity and project failure. A cross-sectional survey of 114 project managers, researchers, and decision-makers was conducted to assess if tools and technologies that participants use in their work are useful and easy to use by asking two questions based on a validated tool of user acceptance of technologies. Additionally, two questions asked participants which tools and technologies were most helpful in their work – one was an open question, and the other provided pre-selected choices of tools and technologies. Few participants chose tools and technologies as a factor that contributes to complexity and project failure, and most participants rated tools and technologies as useful and easy to use. However, the tools and technologies that were chosen by most as helpful for work, tend to be older and simpler and include tools such as checklists. In conclusion, even though tools and technologies are advancing rapidly, most participants in the current survey chose older tools and technologies as helpful in their work. The relevance of these findings is that there appears to be barriers to the adoption of newer technologies such as artificial intelligence and algorithms. The barriers to the adoption of new tools and technologies should be explored further.

Keywords: Technologies, Tools, Utilization

1 Introduction

Project management and new technologies are often adopted by organizations to increase their performance (Haber & Carmeli, 2023). In 2007 it was suggested that even though technology has many problems, advances in technology can allow us to make sense of increasing complexity (Cooke-Davies, Cicmil, Crawford, & Richardson, 2007). Tools and technologies could theoretically be used to reduce complexity and improve efficiency by handling the most time consuming tasks and help with project management (Barcevičius *et al.*, 2019). Reducing human involvement, reduce time, costs and errors and improve speed, consistency and effectiveness (Barcevičius *et al.*, 2019). Coproduction and co-creation of data and knowledge via blockchain, citizens laptops, Webpages, Internet of Things (IoT) platforms, wearables, and sensors are supposed to reduce duplicity, empower, increase participation, efficiency, effectiveness, capabilities, inclusiveness, and better use of scarce resources, but little systematic evidence support positive outcomes (Barcevičius *et al.*, 2019). Other technologies that are currently used or could be used for research in a public health setting include artificial intelligence (AI), Big Data, Geospatial data, Open Government Data, and Network methods (Barcevičius *et al.*, 2019; Codagnone *et al.*, 2020). However, the risks of these newer technologies include job losses in the public sector as a result of automation, technological issues such as bias, discrimination and unfair algorithms, lack of accountability, inaccessibility, and data privacy risks (Barcevičius *et al.*, 2019; Codagnone *et al.*, 2020). In 1984, the term “technostress” (p. 1) was devised, and refers to people having a hard time adapting and coping with new technologies

(Rohwer, Flother, Harth, & Mache, 2022). For example, technologies such as videoconferencing can reduce travel stress and improve opportunities for participation by allowing people to join meetings remotely, but videoconferencing fatigue can impact health negatively (Döring, Moor, Fiedler, Schoenenberg, & Raake, 2022). Additionally, there is no empirical evidence that tools and technologies or digital transformations are actually reducing workload and making work easier (Barcevičius *et al.*, 2019). There are several corporations (Atlassian Corp, Asana Inc., Monday.com) that produce project management apps and software to improve efficiency, but according to a recent article, technology actually inhibits rather than enable, it makes employees less efficient and less engaged, technologies are time consuming, result in burn-out, and many apps add no value and are duplicitous (Boyle, 2022). Evidence based on the consolidated findings from systematic reviews showed that one way to improve the adoption of digital tools and technologies is to evaluate employee “perception of usefulness and willingness to use” (p. 1) of tools and technologies (Borges do Nascimento *et al.*, 2023). The aim of this article is to report survey results of the perceptions of tools and technologies as a factor in complexity and project failure, as well as the usefulness and ease of use of tools and technologies that participants utilize in their work.

2 Methods

An online cross-sectional survey of researchers, project managers, and decision-makers (N=114) was conducted to determine the factors that play a role in project success and failure. As part of this survey, several questions were asked to assess if tools and technologies contribute to complexity, or whether they can be used to address complexity, reduce it, and are helpful to participants. Two of the questions in the survey were based on a validated tool of user acceptance of technologies which was developed by Davis (Davis, 1989). The validity and reliability of the tool was tested, and reliability to test usefulness was 0.98, and reliability for ease of use was 0.94 (Davis, 1989). The original tool use a 7-point Likert scale to test the likeliness that users find the technology/tool useful by asking questions about whether the technology/tool help users to accomplish their tasks more quickly, whether it improves their job performance, increase productivity, enhance effectiveness on the job, and make it easier to do the job (Davis, 1989). A similar scale is used to test ease of use, by asking whether the technology or tool would be easy to learn how to operate, easy to get it to do what you want it to do, whether it is clear and understandable, flexible to interact with, and easy to become skillful at using it (Davis, 1989). In the current survey, a 5-point Likert scale was used where 1 = “not at all”, and 5 = “to a large extent”, to determine the extent to which the tools and technologies that participants use in their work are useful and easy to use. Definitions of “useful” and “easy to use” were provided in the survey and were based on the questions of the tool that Davis developed (Davis, 1989). Additionally, an open question asked which new technology or new way of working participants find most helpful in their work, and another question provided pre-selected choices and asked which of the tools, techniques, or technologies are helpful in participants’ line of work. Before any participants were approached, LIGS University provided ethical clearance to conduct the study. Participants were approached via social media and the EURAM website. Researchers, project managers, and decision-makers who were willing to participate were surveyed. No financial incentives were provided. All participants were asked to provide informed consent online before participating.

3 Results

According to the survey results, tools and technologies seem to be a factor that plays a relatively minor role in complexity and project failure. Only 17.5% of participants picked tools and technologies as a factor that contributes to complexity, and only 2.6% of participants chose tools and technologies as a factor that prevented them from achieving their goals. Most (88.6%) rated tools and technologies as largely useful for their work (>3 on a 5-point Likert scale). Useful tools or technologies were defined as helping to accomplish tasks more quickly, improve job performance and productivity, and make jobs easier. Additionally, 75.5% rated tools and technologies as largely easy to use (>3 on a 5-point Likert scale). Tools or technologies were defined as easy to use when it is easy to learn how to use them and become skillful at

using them. Fifty participants answered an open question asking which new technology or new way of working participants find most helpful in their work. Some answers were not about new technologies or ways of working, and included older technologies such as computers, laptops, open office spaces, social media, online meetings via video call, online marketing, global communications, agile, cloud-based platforms and shared live documents and files. Flexible, hybrid, remote, virtual work was mentioned by 10 participants as helpful, and robotics, automation, AI and algorithms were mentioned by nine as helpful. Other technologies that were mentioned included MIRO, JIRA, Alteryx, Figma and Slack. When pre-selected choices were provided to a question about helpful tools and technologies in participants' line of work (Figure 1), the option chosen by most was TEAMS (72.6%), followed by Google Drive/Chat/Video (61.9%), and checklists (61.1%). Participants could pick more than one option.

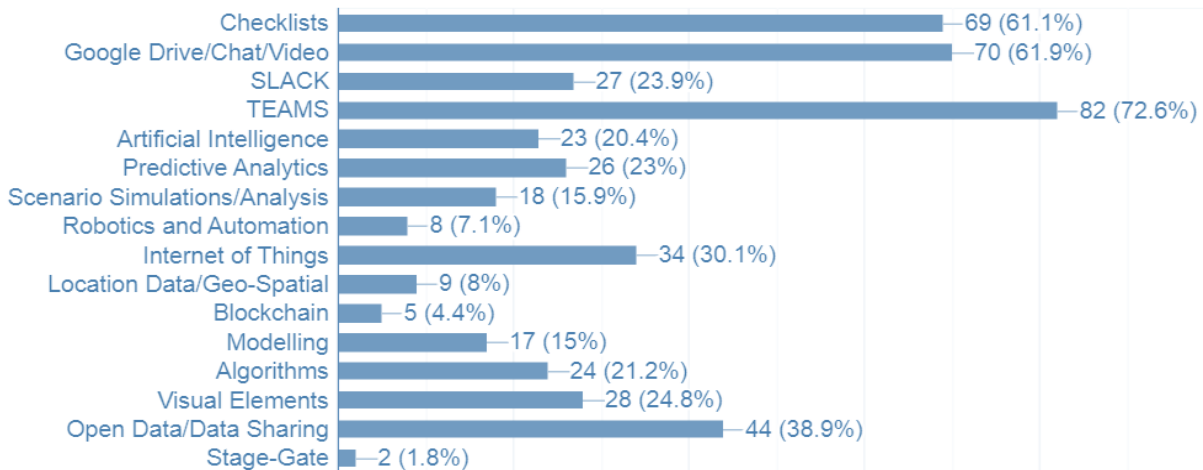


Figure 1: Most helpful tools and technologies for work

Therefore, although survey participants find technologies useful and easy to use, the tools and technologies they use most and find most helpful in their work tend to be older.

4 Discussion

As mentioned in the introduction, some sources posit that the newer and more complex technologies have so far not proven helpful in reducing complexity and workload, and at this stage they just hold promise without evidence to support their practical usefulness. Tools and technologies are advancing rapidly, but there is no empirical evidence that tools and technologies or digital transformations are actually reducing workload and making work easier (Barcevičius *et al.*, 2019). Possible reasons why the potential of new technologies are not realized, include lack of effective implementation, infrastructure issues, technical issues, lack of relevant skills and training, concerns about workload, psychological issues, and employees feeling threatened by the technology (Borges do Nascimento *et al.*, 2023; Haber & Carmeli, 2023). Until the issues with the adoption of new technologies are solved, simple tools such as checklists, charts, diagrams, and decision-trees may suffice. Diagrams can be developed with system boundaries, key actors and points of connection, core activities, where outputs occur, and listing resources for inputs and activities (Sowels, 2021). Organizational and work breakdown structures (WBS) and "RACI (responsible, accountable, consult, and inform) charts" (p. 261) may help to clarify roles and responsibilities for project deliverables (Project Management Institute, 2017). Other tools may include SWOT for understanding the problem and selecting a solution; benchmarking with ideal objective and good practice principles; validated modeling to provide a simplified picture of real processes; scenario analysis to help in selecting prevention, mitigation, response and recovery actions; data acquisition via empirical surveys to collect data about human behavior that is rapid and accurate with good statistical analysis to produce reliable information for decision-

making; theory based on algorithms to solve problems of hypothesis; and Delphi, decision-making trees or matrix (Prochazkova & Prochazka, 2020). Efficient knowledge sharing is improved when everyone transitions to new platforms at the same time, instead of incrementally; the number of virtual tools and technologies are kept to a minimum, or if different technologies are used, by ensuring that they are integrated with each other; knowledge sharing is structured (regular, agreed-upon), but also supported by autonomous sharing; knowledge and information is accessible, searchable, and easily retrievable so people do not become overwhelmed; and ensuring everyone has the necessary knowledge and skills to work with the tools and provide training where needed (Mustonen, 2020). What is required for digital transformation is to access and link different sources of information, using new techniques, and thinking to challenge assumptions, culture, and modeling (Codagnone *et al.*, 2020). To accomplish this we must enable co-creation of data, opening and sharing of data, personalization, and data-driven decision making to improve efficiency and effectiveness (Codagnone *et al.*, 2020). Co-creation increase collaboration and achieve better outcomes (Barcevičius *et al.*, 2019). It would be great if eventually we could use technologies more optimally to generate high quality, relevant and timely research for data-driven decision-making. Efforts are being made, especially in Europe, to co-create data and share it, and this could reduce complexity and duplicity and increase collaboration and improve outcomes. However, barriers to digital transformation exist and include economic (lack of resources to implement), ethical (trust, rights, accountability), legal (privacy, security), organizational (lack of strategy, skills, sharing, alignment; fragmented, silos mentality), social and cultural (cultural barriers, habits, adoption) and technological (access to data, infrastructure, interoperability, storage) factors (Barcevičius *et al.*, 2019). Going forward we need to evaluate how well a certain tool or technology works before we implement it. User-friendly tools that are easy to use can improve performance (Afridi, Turi, Zaufishan, & Rosak-Szyrocka, 2023). One survey reports that one of the three most important features of point of care technologies for healthcare workers was that it must be easy to use (Orwig *et al.*, 2024). However, another study found that employee perception of how easy a technology was to use did not have a significant influence on their intention to use the technology (Edo *et al.*, 2023). Instead, the technical skills of employees and their perception of the usefulness of the technology were positively associated with intention to adopt the technology (Edo *et al.*, 2023). People should be provided training in how to properly use the new tool or technology and the result should be improved quality, and more relevant and timely outcomes (Codagnone *et al.*, 2020). To increase the likelihood of innovative technologies or ways of working being adopted, the benefit in comparison to the status quo must be clear, it must be compatible with values and practices, and be perceived as less complex (Codagnone *et al.*, 2020). Lastly, it may be useful to apply E-Readiness theory and “the technology acceptance model” (p. 11) to evaluate how employees will react to a new technology before implementing it, as well as measure the impact of the technology after implementation to ensure that the intended results are achieved (Davis, 1989; Guetibi, El Hammoumi, & Brito, 2024).

5 Conclusion

Tools and technologies have potential to reduce complexity and improve project success, but various factors can make implementation challenging. A survey of 114 researchers, project managers and decision-makers, found that less than 20% chose tools and technologies as a factor that contribute to complexity and project failure, whereas more than three quarters of participants found tools and technologies useful and easy to use. Therefore, in this study, tools and technologies were perceived as more positive than negative. Twenty percent of respondents to an open question mentioned remote, hybrid or virtual work as helpful, whereas robotics, automation, AI and algorithms were mentioned by 18% as being helpful in their work. Older tools such as checklists were chosen by 61.1% as a helpful tool in participants' work. Findings appear to indicate that there are barriers to the adoption of newer tools and technologies. Before implementing new tools and technologies, organizations should explore the barriers and usefulness of the new tool and technology, as well as employee acceptance and behavioral intentions to ensure optimal

implementation. Simpler tools such as checklists, charts and diagrams work well and may be useful in settings where more advanced technologies are not useful or cannot be implemented.

6 Declarations

6.1 Limitations

Outcomes were not measured with objective tools and results were based on survey participants' subjective perceptions. Due to time and resource limitations, randomized sampling was not possible for the survey. A limitation of non-probability sampling methods, as was used for the survey, is that it does not meet the basic assumptions of most statistical tests (Baker *et al.*, 2013; Bruce *et al.*, 2018; Hirschauer *et al.*, 2020; Trafimow *et al.*, 2018; Williamson, 2003)

6.2 Acknowledgements

Many thanks to the participants who responded to the survey.

6.3 Data Availability

Anonymized data from the survey is available upon request.

6.4 Informed Consent

Participants provided informed consent online before participating in the survey.

6.5 Competing Interests

There is no conflict of interest to declare.

6.6 Publisher's Note

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