

The Risks of Agile Methods in the Context of Digital Transformation

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Abstract

This paper highlights the main elements of a doctoral research regarding the risks of agile methods in the context of digital transformation. The actual innovative times are conducting organizations to roll and improve their processes by using digital practices in an agile pattern. Turning projects teams to adapt agile methods in different scopes are aiming to improve the quality, to deliver excellent customer value and to drive velocity. If in the last years, innovation slowly entered the market, but it did not provide credibility that someday it will monopolize the organizational processes, the actual days are convincing skeptics that it is mandatory to digitalize the processes to compete the market. Therefore, organizations are strongly involved in the process of usage the agile methods. Though, one of the main project management activity is thought-out the risk management which in the agile methodology is related as well to risk prioritization. There are several risks areas that should be taken into consideration by projects teams before toiling the agile path. The aim of this study is to provide a theoretical framework for further studies on the risks of agile methods used by organizations, in the context of innovation usage. Based on a total of 100 publications, including recognized publishers, in this study we strive to provide a holistic overview on current risks of agile methods and possible risk prevention methods for organizations.

Keywords: Agile methods, agility risks, digital transformation, organizational innovation.

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Introduction

Reduced costs, reduced time, reduced risks, process simplification, value prioritization and quality improvement are some often encountered keywords in organizations' processes, so they align with the continuous improvement criteria. As today business environments are perceived as ultra-dynamic and hyper competitive, being agile is not considered anymore as optional, but needed to adapt its strategies and to provide successful actions (Ravichandran, 2018). Unlimited internet connection offers to clients the possibility to identify instantly better restaurants, better hotels and better services by a single phone touch (Fogoros, et al., 2020). Agility offers to the client structured deliverables, transparency, communication, swiftness and reasonable prices. Over and above, teams using agile methods are regrouping on a regular basis, daily or weekly, so they are continuously challenged: some demands become far-reaching or involves new ones to prioritize. They are prepared every time to schedule changes and push to other functionalities, by quickly reacting to scope. In this way, the value-based prioritization is one of the main capacities of this teams. Hence, not a single change is easy; clearly, people are used to traditional approaches and may be reticent to use other methodologies than the ones

known so far. This is why adopting agility in organizations can be a sensitive and risky process to implement.

One of the fundamentals of project management activities is represented by the risk management. Though, once starting using agile methods in different activities, risk prioritization must be taken into consideration as well. If not correctly managed since the beginning, a project may encounter issues right before it starts. All teams should first understand the agile methods and its possible impact before starting using it, by considering a plan to alleviate risks (McGee, 2014). Based on the project's characteristics, the agile teams may have different size and departments involved, which raises different dilemmas: deteriorated productivity due to long meetings or communication gaps due to different spoken languages.

Based on statistics provided by the Project Management Institute in 2017, the agile methods have been integrated in organizations on a percentage of 71% (Project Management Institute, 2017), as observed in Figure 1.

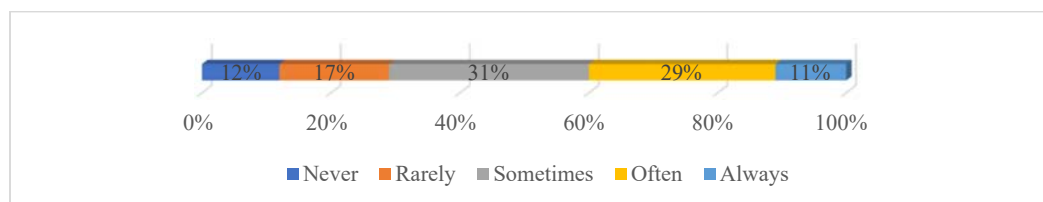


Figure no. 1. Agile approaches in organizations

Source: Project Management Institute, 2017. [online] Available at: <<https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-the-profession-2017.pdf>> [Accessed 20 March 2021]

Though considered by several senior executives that agility is a key to success, 2018's statistics showed that agile has not fully spread throughout organizational processes. It is considered that one of the reasons would be the lack of official line up in risk management protocols, opposite of the traditional waterfall risk management procedures, which are more proper. Agility offers continuous improvement and change, but sometimes these often-considered strengths of processes, may turn out as being risky. Risks are often considered as a reason of alert, but it's not the risk itself the controversy point but its management strategy. As specified by Cagan, M. (2008) in her research, risk is a needed element in the innovation processes: the project and product owners should encourage up to a certain point risk-taking among teams or at least consider the possible advantages of it before the final decision. There is not a specific definition for agility, but researchers tend to rely on it to market determinants and challenges, such as IoT (Internet of Things), innovation, digitalization, sustainability and technology (Skare and Soriano, 2021) and to consider it as part of an organization's success. Turning an organization into an agile one means to provide first several skills, such as a clear vision, a governance and a strategic planning. It is considered that committing people in several organizational restructuring processes, they are more likely to create systems based on people needs who are aiming to be open to change and to new learning approaches (Skare and Soriano, 2021). It represents the process of removing agility barriers, such as eliminating complex rules, to allow greater flexibility (Hoelbeche, 2019). Agility is not only related to organizational processes, but to human being as well. In everything people use to do as employees or as humans, agility should be present in everything we do. Using agile methods while developing a software between a company is indeed a good idea to quickly react and respond to the client's needs. Though, letting someone else take the place to the checkout while arranging your products on the tape at the supermarket is also defined agility. So, people must adopt agile reactions in everything they do. Undoubtedly, companies can no longer afford to work on a specific project for years – the current dynamic times we are facing may suddenly change the client's needs so the product developed at the end will no longer represent a current need.

In their research, Bris and Caballero (2015) defined firm's agility as a determinant of specific organization capability and regional/industry level factors. Innovation and digitization brought fast and unexpected changes, each of them turning into challenges for organizations on the market. Hence, agility must seem redundant in a business environment which focus is risk-only. Nowadays businesses

are facing multiple categories of risks: business continuity risks, compliance risks, e-commerce risks, financial risks or fraud risks. In their research, Marquardt, et al. (2018) specified that the lack of IT skills of the employees and the availability of specialists is the biggest obstacle in the alignment with digitalization projects. Consequently, organizations are struggling to offer responses for all these risks, such as: risk avoidance (by eliminating the cause), controlling (reducing the consequences by severity of impact), acceptance (problem-solving oriented organizational culture) and allocation (insurance or subcontracting). In reverse, the usage of agile methods brings transparency, collaborative planning and customer involvement. Though, none of the above should reject the other. It is often considered that traditional risk management and the agile methods' risks are complimentary.

Review of the scientific literature

Digital transformations in organizations

To stay competitive, organizations are nowadays continuously challenged by digital technology, as implementing robust digital tools is crucial to stay on the market. Moreover, digital transformation affects the business structures by implementing a new playing field and changing the competitiveness of firms on various levels (Grab et al., 2019). Fast actions, adaptability and digital practices implementation are elevating the whole industry. Anticipations made by Accenture in a survey report (Awalegaonkar, 2019), shows that by 2022, strategic scaling will be imperative to success. The predictions show that 40% of industrial organizations will adopt IoT and artificial intelligence, 83% of executives confirm that the growth objectives won't be achieved without scaling to AI and 75% of organizations consider they risk going out of business in the next years if they don't scale to (Awalegaonkar, 2019). In the latest research on the concept of digitization and innovation it was concluded that an innovation process that constraints the contribution of several stakeholders are turning into the principal source of sustainable development (Meselu and Berhan, 2020). Even if digital technologies are the departure point for process innovation, other factors such as customer's expectations and digital competitors are very important. Furthermore, traditional business models are as well influenced by technology in the global market: the hotel industry was suddenly replaced by Booking or Airbnb, the music industry is continuously challenged by Spotify and Starbucks was digitalized by offering the possibility to pay with their own card for gaining points and obtaining several benefits (Feroz, et al., 2021).

Digital transformation doesn't represent a single step designed to upgrade some organizational processes, but a process which includes fundamental changes, and which has the capability to create additional opportunities of improvement (Feroz, et al., 2021). It was also debated by Verhoef et al. (2019) in their study that digitization, digitalization and digital transformation should not be perceived as the same: while digitization means automated tasks, digitalization brings extension of digital components to product or service offerings and digital transformation includes the business model innovative criteria and digital platforms. Initially introduced in the manufacturing industry, 4.0 in the scientific literature, the fundamental design principals of 4.0 Industry are the following: decentralization, horizontal integration, interoperability, modularity, product and service individualization, real-time capability, service orientation, smart factory, smart product, vertical integration and virtualization. On the other side, there are the technology trends: advanced manufacturing, augmented and virtual reality, automation and industrial robotics, big data analytics, blockchain, cloud data and computing, internet of people, internet of services, internet of things, simulation and modelling and cybersecurity. Companies are adopting several sustainable and innovative business practices, such as artificial intelligence, IoT, big data analytics and blockchain. Between them, blockchain is considered a software with hyper potential to achieve sustainability in business and industrial practices (Leng, et al., 2020). It can increase the product life cycle, maximize the resource usage and contribute to increased sustainability (Esmailian, et al., 2020). In 2013, Bharadwaj et al. considered that organizational strategy is defined and accomplished by extracting digital resources to create differential value. Later in 2021, Kurtz, et al. mentioned that there is a gap of knowledge on archetypical strategic orientations concerning the ability of organizations to adapt.

Holding an optimistic view, digitization and innovation offers many opportunities for organizations to improve its processes, but as well to create sustainable product life cycles. As Maier, D. (2018)

specified in his research, innovations are defined as new creations of economic significance, performed by organizations.

Agile methods and agility usage in organizations

Once introduced on the market, agile software development methodology was described as the opposite of the traditional waterfall model. The logic of agility offers a flexible approach, followed by a learning from failure, while waterfall stood in a rigorous process management (Fogoros, et al., 2020). As the traditional approach supposes a predefined model with planning based on a work classification structure with landmarks and work processes (Overhage and Schlauderer, 2012), agile focuses on a process control based on meeting’s clients’ needs. As nowadays change is constant and brutal, agile methods are proposing three levels of planning: the release planning (basic strategic aspects), the sprint planning (operational details) and the daily scrum (daily meetings of members for tasks and current state of the project. In Table no.1, we observe the differences between agile methods and traditional methods.

Table no. 1. Opposite perspective between agile and traditional

Method	Planning	Requirement	Documentation	Controlling	Collaboration	Reflection
Traditional method	Landmark planned in advance	Fixed since the beginning of the project	Essential part of the development process	Part of achievement is on team members	Tasks assigned by the project manager	Discussions only at the end of the project
Agile method	Repetition is the base of the process	Constant talk between clients and editors	Unequivocal documentation	Constant meetings on the progress	Flat hierarchy	Continuous communication at the end of each sprint

Source: Overhage and Schlauderer, 2012

Agile methods are running from the philosophy of close, intermittent and compiled collaborations, having as main characteristics adaptive planning evolutionary development, flexibility in the face of changes and continuous communication (Akil Rafeek, 2019). In their research, Lopez-Alcarria, et al. (2019) specified that agile methods praise adaptive development by short and continuous cycles of planning, action, correction and adjustment to provide valuable outcomes. Hence, agility means an ability to respond to change. As noticed by Gannod, et al. (2015) in their article, a special emphasis is exhibited by agile methods on facilitating interactions and team dynamics, supporting collaboration between different departments, articulating goals and encouraging innovation and experimentation. In 2001, Fowler and Highsmith, for the first time, gathered together a team of 17 software developers and agile coaches and practitioners and managed together to define the manifesto for agile, as it follows: individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, responding to change over following a plan.

Organizations are facing competitive times during the current uncertainty and turbulence in the business environment, so quickly answering to client’s needs is the key to market dynamics. Agile methods presume quickness (fast answer to businesses and clients’ needs), resources (people, technology, processes, knowledge) and adaptability (organization’s flexibility). As there are multiple influencing factors on innovation processes, to apply the concept of agility to innovation requires a clear definition due to specificity. Brand, et al. (2021) in their article considers that the main three capabilities of agility (respond quickly, proactively drive change and integrate the environment) provide a basic understanding of it. Based on their research, the corporate strategy and the organizational system are in charge of shaping innovation between an organization (Brand, et al., 2021). Moreover, Ahlback, et al. (2017) noticed in their recent research that 81% of respondents on a survey observed an increased business performance once agility adopted. During a qualitative analysis, Walter (2020) identified four agility categories in the organizational agility: agility drivers, agility enablers, agility capabilities and agility dimensions. Though, agility should not be considered as a radical approach, which can apply or not, but rather as an integrated holistic concept, taking into account the organizational context and the business environment, as well as independent of the

industry. Walter (2020), specified in her research that an agile organization is oriented both internally and externally. The perception difference is represented as it follows: on the internal orientation, the organization focuses on the coordination of agility categories, while on the external one, it shows a high level of vigilance on the competitive market and the environmental changes.

To conclude, the investment in the level of digitization of an organization, on RandD and design, new product development, market research and branding are considered the main determinants of an agile form (Skare and Soriano, 2021).

Research methodology

Considering as milestone a previous research in the agile lifecycle, where a study on the agile digital transformation in relation to organizational innovation was developed, this article proposes an empirical research based on the existing scientific literature, relied on statistics and results obtained before the possible future changes of the actual sanitary crisis. The aim of this study is to provide a theoretical framework for further studies on the risks of agile methods used by organizations, in the context of innovation usage. Based on a total of 100 publications, including recognized publishers and statistics at European level, in this study we strive to provide a holistic overview on current challenges of agility, risks encountered and recommendations for organizations. A step-by-step process of identification of articles and analyse was followed: selection of sources, search criteria settings (use of keywords), selection criteria (screening of the articles) and content analysis and synthesis (classification of articles based on theme).

Results and discussion

The unpredictable times companies are facing nowadays are conducting them to increase its level of flexibility, by applying methodologies that can answer to customers’ requirements fast, cheap and safe. By definition, agility is fast, cheap, safe, comfortable and easy, when correctly implemented and understood by its users. Though, several risks such as less predictability, lack of innovation and decreased level of staff knowledge are identified in the scientific literature. This study adds a contribution for further studies on the risks of agile methods used by organizations, in the context of innovation usage. Based on a total of 100 publications, including recognized publishers, we strive to provide a theoretical framework on the risks of agile methods used in organizations followed by some prevention methods.

Table no. 2. Risks of agile methods

Risk area	Identified risk of agile methods	Source of research	Authors’ statement	Prevention methods
Demographics	Less predictability	Garbar, D., 2020	Constant changes, no long-term predictions	Project split in smaller phases, requirement clarifications
	Time zone differences, local holidays, training plans	McGee, T., 2014	Iteration planning to know the availability of each team member	Find the best way to communicate to facilitate work between different time slots, alternate meeting times
Team skillset	Not sticking to Agile principles	Garbar, D., 2020	Agile usage while following traditional management principles	Guide the clients, teach them to apply the appropriate principles
	Lack of staff knowledge	Garbar, D., 2020	Agile training investment needed	Support knowledge sharing and mentoring practices
	Decreased productivity	McGee, T., 2014	Large Scrum teams increase the time	Work with small Scrum sub-teams

			spend in meetings and decrease productivity	
	Dispersed team members	McGee, T., 2014	Working face-to-face helps to identify the best methods of work	Often co-location of teams for even a short timeframe
	Lack of early gap acknowledge	McGee, T., 2014	Gaps from both technical and agile should be observed at the beginning	Provide specialized training and time to achieve abilities
	Not co-locate team members by discipline or role	McGee, T., 2014	Look to collocate similar skillsets team members	The product owner and the business analyst may increase partnering chances
	Not pairing senior team members	McGee, T., 2014	Identify team members with specific technical skillsets	Usage of pair-programming method
	Lack of AgileMaster	McGee, T., 2014	Coaches have a deep understanding of agile methods	Coaches can be internal or external and can help the team ramp up more quickly
Culture	Agile is not suitable for a project	Garbar, D., 2020	The need for a clear scope, a clear requirement, fixed budget	Use another more profitable approach
	Not recognize or adjust to different cultures	McGee, T., 2014	Cultural differences play into project's dynamics, some cultures are more vocal than others	Team members must understand an individual's organizational culture
	No transparency	Buganova, K. and Šimíčková, J., 2019	Not revealing the errors	Regularly information about possible errors
	Absence of basic agile education between managers	McGee, T., 2014	Management should know the agile benefits and its possible impacts to the organizations	Training provided for management team
	Lack of communication with the clients	McGee, T., 2014	Customers should be part of the process development	Daily communication with customers which can prioritize the backlog evolutions
Supplier dependencies	Budget risks	Garbar, D., 2020	Agile methods assume constant changes of the product related to market needs	Lean development to manage costs
	Unexpected delays	McGee, T., 2014	Sometimes the development is completed earlier, but implemented in future release	Stay engaged with suppliers

Technical debt	Garbar, D., 2020	Many changes which lead to low system performance	Clarify at the very beginning the non-functional requirements related to performance quality
Not-added value	Buganova, K. and Šimíčková, J., 2019	Later usage of the product or its prototype	In order to make money sooner, the usage should start as soon as possible
Not adequately monitoring schedule, cost and scope variables	Nguyen, D.S., 2016	Some developments fail because of project managers which are not following all the variables	Leaders must be cognizant of organizational issues: motivation, team synergy, etc.
Market's feedback	Berg et al., 2020	Level of understanding of agile methodology	Continuous communication
Third-party vendors	Berg et al., 2020	Adoption of tools and components	Written agreements on services
Uncertainty	Tavares et al., 2019	Possible event that can affect the product	Continuous surveillance
Rare deliveries	Tavares et al., 2019	The customer will lose trust in the product	Make frequent deliveries
Quality of outsourced partners	Berg et al., 2020	Outsourced manual testing	Offer staff flexibility, develop internal staff and focus on core tasks

Source: Authors own research

In Figure 2 we observed the tendency of publishing scientific articles containing “agile risks” and “agile” as keywords, with a clear vision of the fact that 2020 represented the year when agility managed to penetrate the organizational processes, based on ScienceDirect. Indeed, in the pandemic context, agility was present in most organizational processes.

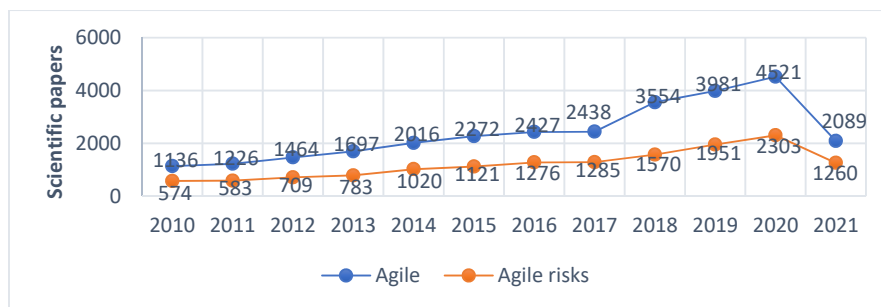


Figure no. 2. Scientific papers publication tendency on agile

Source: Elaborated by the authors

Conclusions

Based on the research results, this paper concludes that there are four main categories of agile methods risks identified in the scientific literature: demographics, team skillset, culture and supplier dependencies. Indeed, lack of knowledge and supplier dependencies are situated on the top. Agile

methods started to be used in organizations since 2000, but only in the latest years its importance increased in process' organizations; as observed before, 2020 represented the year when most of the authors started to invest time in agility's research. Clearly, in the pandemic context, all activity domains were affected, due to daily changes and unpredictable situations, so being agile was a mandatory adoption. The client's demand had to be rapidly answered and following a traditional methodology didn't represent anymore an option. We aim that this study will help organizations to prevent a part of the risks associated with agile methods grace to the preventing methods proposed, before adopting it in their processes, as adapting to challenges brought by digitization is nowadays necessary.

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