

Identifying project management practices in innovative organizations: a systematic review

Identificando práticas de gerenciamento de projetos em organizações inovadoras: uma revisão sistemática

Marcelo da Costa Borba¹

Lara Régia Melo Filho²

Josefa Edileide Santos Ramos³

Marcelo Luiz Monteiro Marinho⁴

Abstract

Project management practices are increasingly popular in organizations, it is driven mainly by the use of information technology and the dynamic environment. Currently, innovative companies seek to know and analyze which management practices can fit their projects. Considering the big number of existing it becomes fundamental to pay attention to the purpose of the project, its human potential and the competitive advantages generated. This research aims to highlight the practices used on the management of projects adopted by innovative organizations and attempt to organize according to their purpose or function. A systematic literature review was conducted to research innovative project

¹ Doutorando em Agronegócios pela Universidade Federal do Rio Grande do Sul - UFRGS, Porto Alegre, Rio Grande do Sul - Brasil. ORCID: <https://orcid.org/0000-0002-7173-1199> | marcelodcborba@gmail.com

² Mestre em Administração e Desenvolvimento Rural pela Universidade Federal Rural de Pernambuco - UFRPE, Recife, Pernambuco - Brasil. ORCID: <https://orcid.org/0000-0002-3727-8271> | lararmf@gmail.com

³ Doutoranda em Agronegócios pela Universidade Federal do Rio Grande do Sul - UFRGS, Porto Alegre, Rio Grande do Sul - Brasil. | ORCID: <https://orcid.org/0000-0002-8129-6338> | edileideramos@gmail.com

⁴ Doutor em Ciência da Computação pela Universidade Federal de Pernambuco - UFPE, Recife, Pernambuco - Brasil. | ORCID: <https://orcid.org/0000-0001-9575-8161> | marcelo.marinho@ufrpe.br

Como citar:

Borba, M. da C., Melo Filho, L. R., Ramos, J. E. S., & Marinho, M. L. M. (2020). Identifying project management practices in innovative organizations: a systematic review. *Revista Inovação, Projetos e Tecnologias*, 8(1), 97-108. <https://doi.org/10.5585/iptec.v8i1.17161>

management practices. The results revealed twenty-three practices used. In addition, it was noticed that combined use of practices in project management can be a determining factor in the success of the project. Therefore, it is necessary to work with multidisciplinary teams where flexibility, agility, creativity and innovation is the rule.

Keywords: Agile management; Risk management; Combinational Capability; PMBOK.

Resumo

As práticas de gestão de projetos estão cada vez mais populares nas organizações, elas são impulsionadas principalmente pelo uso da tecnologia da informação e do ambiente dinâmico. Assim, as empresas inovadoras precisam procurar conhecer e analisar quais práticas de gerenciamento podem caber em seus projetos. Considerando o grande número de existentes, torna-se fundamental prestar atenção ao propósito do projeto, seu potencial humano e as vantagens competitivas geradas. Esta pesquisa visa destacar as práticas utilizadas na gestão de projetos adotados por organizações inovadoras e tenta organizá-las de acordo com sua finalidade ou função. Realizou-se uma revisão sistemática da literatura para encontrar as práticas inovadoras de gerenciamento de projetos. Os resultados revelaram vinte e três práticas. Além disso, observou-se que o uso combinado de práticas no gerenciamento de projetos pode ser um fator determinante no sucesso do projeto. Portanto, é necessário trabalhar com equipes multidisciplinares em que flexibilidade, agilidade, criatividade e inovação são a regra.

Palavras-chave: Gestão Ágil; Gerenciamento de riscos; Capacidade combinada; PMBOK.

1 Introduction

Project management, is well developed and accepted today as a necessary competence for innovative organizations. Several methods and techniques are constantly mentioned in the development of a project, from its conception to the final delivery of the products. The way of adoption in project management depend several organizational factors such as structure, culture, corporate climate, product and/or developed services and of the uncertainties. Furthermore, due to the complexity of the management process, it is difficult to establish accurate management approaches, thus combinations and adaptations are required in this field.

On this Morris (1990) called attention to the use of project management term, which for him is limited to tools and techniques, since management of project would be more holistic, encompassing both project and management. Thus, there would be four axes of management of projects: definition, who covers objectives, strategy, technology and design; attitudes; finance and schedule; and implementation. However, Project Management Institute [PMI] (2013) defines project management as the application of knowledge, skills, tools and techniques to meet project demands in the development of the five process groups (initiating, planning, executing, controlling, and closing). International Project Management Institute [IPMA] (2015) has a similar definition and considers project management as implementation of methods, techniques, tools and competences (knowledge, skills and attitudes). In addition, it includes: efficient use of resources and stakeholder satisfaction needs as important elements to achieve the goals of project. Therefore, in order to avoid confusion, Project Management and Management of Project will be used as synonyms.

In this paper the choice of innovative organizations as object of study is based on the classification developed by Mintzberg, where innovative organizations are in dynamic environments, emphasize knowledge, research and development; they seek to work with teams of multidisciplinary projects, and already have flexibility, agility, creativity and innovation capacity (Maximiano, 2011; Wood Jr., & Caldas 2007). Beglinger (2003) adds that innovative organizations develop leadership through innovation and communication, with a focus in continuous improvement, shared accountability, decision-making structures and organizational tolerance for mistakes. With this, innovative organizations are a favorable niche for researching project management practices because it could find the newest. In this context, the main research question that guides this work is: What

project management practices are being applied in innovative organizations? By practices it will consider strategies, approaches, techniques, tools and methods. Therefore, to understand which actions are more prevalent in these companies, academic articles dated in the last five years were searched in data sources. The collected data is qualitative (quotas that answer the research question). Therefore, the research was done through a systematic literature review (SLR), one of the indicated methods to collect and analyze data in descriptive research. In addition to this section, the remainder of this paper is structured as follows: have a theoretical reference about project management practices; Section 3 contains the research method; 4 presents the results with the analysis of the findings and discussion of the implications to project management; and finally the conclusions with most significant ideas, limitations and suggestions for future research.

2 Theoretical reference

Now we will try to define some concepts that will be important for the organization of a classification. According to Artto, Kujala, Dietrich and Martinsuo (2008), strategy in project management is linked with the goals and objectives of the project, to achieve a desired position in a competitive environment. Therefore, the project strategy is the direction taken that contributes to the success of the project. For Kostalova, Tetrevoa, and Svedik (2015) the approaches are applied throughout the project. Already the methods, techniques and tools are applied according to the phase in the life cycle of the project, where tools are linked in apps and softwares. For example, during initiating it is possible to use cost benefit analysis; in planning, can to be use work breakdown structure (WBS) and or critical path method; for executing, monitoring and controlling is possible to use Earned Value Management; and for closing, learned lessons. Techniques “a particular way of doing something, especially one in which you have to learn special skills” and tool is “a thing that helps you to do your job or to achieve something”.

From these definitions this paper focuses on practices like a generic whole of the actions of project management, strategy as the way taken to reach goals of the project and or of the organization with success. Process, methodology and approach as course of actions in the establishment of practical activities, techniques and tools that take place in the life cycle of the project. For Nagano, Stefanovitz, and Vick (2014) the challenge of project management is in the development or composition of new practices aligned with current technological paradigms. Each project has its peculiarity, so it is not a mechanical process with standardized inputs and outputs. It is therefore impossible to minimize its intrinsically human dimension: creativity to generate ideas, experience to evaluate proposals, intuition to take risks, insisting on new attempts after failure (Eweje, Turner, & Müller, 2012; Ning, 2017). This makes the social and cultural context of an organization play an important role in the innovation process (Hazir, 2015).

3 Methodology

Using the taxonomy by Vergara (2016), for purposes and means of investigation, the present study is characterized as a descriptive research on its purposes, as it aims to describe project management finding in innovative organizations, and a SLR as a means collect and analyze the data. As for the approach method, research is qualitative because it analyzes the quotas that answer the research question. The SLR method consists of rigorous and reliable evaluation of the research done within a specific theme (Brereton, Kitchenham, Budgen Turner & Khalil, 2007). Moreover, SRL is an instrument to map published works in the subject of specific research so that the researcher is able

to elaborate a synthesis of the existing knowledge on the subject (Biolchini, Mian, Natali, Conte, & Travassos, 2007; Stingl & Geraldi, 2017). To execute the SRL, initially a protocol was elaborated with the steps and strategies of the research, such as: research question, population, resources used, keywords, search string, inclusion and exclusion criteria, and quality requirements. Initially, it was defined that the research team would be formed by 4 researchers. In preliminary researches, it noticed a good answer of the bases Science Direct and Springer, were found 1119 papers. The databases Scopus and the Web of Science were not used because some articles did not allow access to the full text. And was added the International Journal of Project Management (IJPM) due to its relevance in the area and expressive amount of articles in the area of project management. Thus, the guiding question of the SRL were developed (what are the project management practices adopted by innovative organizations?).

A systematic review incorporates strategy for research aiming to identify and retrieve even the slightest information which meets the systematic review eligibility criteria. There are conditions to determine if primary studies are about the systematic review research questions. The research results are transformed into in a sequential publication list of the chosen engines. Each resource has a different community with differing interests, using different language, and examining different issues. The engines provide different research syntaxes as well. Therefore, different resources might require different research strings.

To help us in the SRL process we have established the inclusion and exclusion criteria. The inclusion criteria are: complete research articles, primary and secondary research (free full text), articles published in the last five years, all that highlights what has been most important recently. The exclusion criteria were: articles published in other languages apart from English, incomplete articles, duplicates articles, repeat article, articles that did not respond to the research question, articles with incomplete results.

After the defined criteria, a research test of the terms in the Science Direct and Spring was carried out, to verify if the results answered the research question. According to this, research terms were selected from vocabulary related to project management, innovative organizations, and their synonyms the research terms chosen were as follows: (Technique OR strategy OR tool OR method OR practice OR technical OR way OR process OR tactics or tactic or framework) AND (“project management” OR “management of project” OR managing OR “project manager” OR “managing projects”) AND (“innovative organization” OR “creative organization” OR “innovative company” OR “innovative enterprise” OR “innovative institution” OR “innovative firm” OR “innovative business” OR “innovative entity” OR “creative company” OR “creative enterprise”).

With the search terms defined, step 1 was data search automatic. Step 2 data selection in 2 phases (a) Reading Title, Keywords and Abstract; (b) Reading the Introduction and Conclusion. Followed by step 3, data extraction and quality assessment, and lastly, step 4, analysis and synthesis of evidences. To be included in the first phase of the data selection it was necessary for the title, abstract, or keywords to show some kind of link to the research question. In the second phase it was considered to have within the introduction or conclusion indications that answered the question of the review. In the third step the quotas were extracted considering that the introduction should contain justification, the objectives and the research question; subjects were treated with clarity and were adequately referenced during the development of the work; had clear methodology, results and conclusions, and answered the research question. Assessment of data quality was done using the five-point Likert Scale from: (1 = terrible, 2 = bad, 3 = regular, 4 = good, 5 = great). The articles with grades 3, 4, and 5 being kept. In step 4 the analysis and

summaries were selected as primary sources and data that effectively answered the question proposed by the review was separated.

In the data search, 1119 articles were found and only 1 identified as duplicate, leaving 1118 papers for the next step. As a result, from data selection, in the first phase, 98 papers were picked for the list of potential primary sources, in the second only 35, the others did not respond to the research question or did not fit the inclusion and exclusion criteria. After that, 123 citations were extracted in the extraction of data and, in spite of this, in the evaluation of quality, 5 documents were discarded for being of inferior quality to regular, considering the question of the research. Thus, 30 articles were considered as having regular, good and excellent quality (table 1) and these articles produced 104 quotas, where some had more than 1 evidence in the data. In the synthesis step, the information is tabulated consistently with the research question, highlighting similarities and differences between the results. The analysis of quotas will be discussed in the next section.

Table 1: 30 papers select in step 3

(Ashurst et al. 2012)	(Lenfle, 2014)	(Peng et al., 2014)
(Badir et al., 2012)	(Lewrick, Link, & Lewrick, 2015)	(Sádaba et al., 2014)
(Bonesso et al., 2011)	(Love, Roper, & Bryson, 2011)	(Salunke et al., 2011)
(Chou & Chou, 2011)	(Manohar & Pandit, 2014)	(Sarooghi, Libaers, & Burkemper, 2013)
(Cuijpers, Guenter, & Hussinger, 2011)	(Maranhão, Marinho, & Moura, 2015)	(Scarpellini et al., 2016)
(Dodgson et al., 2015)	(McHugh & Hogan, 2011)	(Shirahada & Hamazaki, 2013)
(Donate & Pablo, 2014)	(Mladenow et al., 2014)	(Şimşit et al., 2014)
(Ford et al., 2012)	(Nagano et al., 2014)	(Sung, 2011)
(Hittmár et al., 2014)	(Neves et al., 2014)	(Wang & Tsai, 2014)
(Klarner, Treffers, & Picot, 2013)	(Nicolás & Cerdán, 2011)	(Wen & Qiang, 2016)

Fonte: The authors.

4 Results and analysis

We will be analyze starting with the strategies and finishing with the techniques and tools but when a relationship between they appear we will analyze them together for a more thorough understanding. The most important findings will be highlighted. In the Open Sourcing the focus is on open innovative and outsourcing. This strategy predicts that the barriers of the organization are permeable to external actors, relating directly to crowdsourcing and co-creation. It is another common strategy within project management. Bonesso, Comacchio, and Pizzi (2011), Chou and Chou (2011), Dodgson, Gann, MacAulay, and Davies (2015) affirm that open sourcing is a strategy to helps the company increase capacity and flexibility, as there is a sharing of resources, skills and technologies that imply cost reduction and risks in the projects. Crowdsourcing appears constantly in

the findings, when was referring to a methodology of communication and integration of people, inside and outside of the organization (Bonesso et al., 2011; Maranhão, Marinho & De Moura, 2015; Mladenow, Bauer, & Strauss, 2014). In this context, an information management system is extremely important to support initiatives such as Crowdsourcing, because from it you can create online platforms for information sharing to better assist the company with obtaining opinions from employees, partners, customers, potential customers, that is to of anyone want to give suggestions for innovative solutions to problems (Manohar & Pandit, 2014). Co-creation/Co-production is an approach, within the strategy of open sourcing, born in the context of collaboration between individuals. Consists of conducting research with customers to improve with the product/ service provided and/or development of new products. Companies seek to learn from their clients as well as teach them. It is a two-way street. In this sense, this methodology also involves Benchmarking and Brainstorming with a focus on learning with the client and data mining to collect the data (Ford, Edvardsson, Dickson, & Enquist, 2012; Mladenow et al., 2014).

Continuing with the strategies, the combinatorial capacity was observed in 9 of the findings. With its organizations seeking to maximize tangible and intangible resources. It was found that by combining methodologies, companies are more prepared to face possible changes in the market. According to Lewrick, Link and Lewrick (2015) and Salunke, Weerawardena and McColl-Kennedy (2011) (20 empowers organizations to create value, acknowledge changing conditions of the market, and quickly cope with them. In this context, it verified the combination of more traditional methodologies like the Project Management Body of Knowledge (PMBOK) by the Project Management Institute (PMI) with the Agile Methodologies. Thus, PMBOK is defined as one of the project management practices organized by the Project Management Institute (PMI). It is seen as a traditional methodology, with many steps and areas, rigid structure, large amount of reports, and often complex because it presents with 47 managements processes. The Agile Methodologies, also highlighted in the works, are a counterpoint to the traditional methods. These are ways of managing projects where the level of uncertainty is high, requires creativity, and flexibility. For Ashurst, Freer, Ekdahl, and Gibbons (2012) the organizations are adopting agile practices and making them the core of their overall approach to business projects. This approach is also incorporates Design Thinking into production and design service (Ashurst et al., 2012). Generating indirect benefit management with a focus on benefits to customers and stakeholders (Lewrick et al., 2015; Şimşit, Vayvay, & Öztürk, 2014).

Still as far as strategies are concerned, there are eco-innovations that can act in conjunction with the organic integration process and innovation management system. Since development requires environments that stimulate the people and contribute to the emergence of creations (Nagano et al., 2014; Scarpellini et al., 2016). Show that these attributes constitute the driving force of the dynamic training process and as a result generates the competitive advantage based on innovation. Understanding the background of competitive advantage helps managers to choose appropriate learning mechanisms to promote and nurture innovation and pursue strategies to gain competitive advantage (Nagano et al. 2014; Scarpellini, Valero-Gil & Portillo-Tarragona, 2016). The last identified strategy is Blue Ocean that generates the possibility of leaps of values for the company and consumers. For Hittmár, Varmus and Lendel (2014) and Şimşit, Vayvay, and Öztürk (2014) along with this strategy, new concepts such as lateral marketing and lateral thinking are emerging in businesses, as actions for the implementation of innovation and the development of innovative strategies (Hittmár *et al.*, 2014). Continuing with the approaches, methodologies and processes, multifunctional team is used to form a team that has interdisciplinary knowledge and skills, fostering divergent thinking based on the diversity of knowledge, behaviors, experiences and skills. It is

related to the dynamic ability of companies to create new knowledge through resource combinations. Thus, the use of multifunction team has to collaborate to translate ideas into products and/or services. Supports for diversity can help to improve existing products, building new products, reducing costs and increasing quality. Job rotation and spin-along companies are practices used by businesses that take advantage of the multifunctional team. In the case of job rotation, when changing sectors, the employee increases the possibility of learning from different co-workers, allowing an increase in the knowledge and productivity (Klarner, Treffers, & Picot, 2013).

Risk Management is one of the areas foreseen in traditional methodologies and one of the most neglected. There are several techniques to reduce risk, such as analytical risk matrix, Delphi technique, risk map, and trial and error. In this area, an idea that is on the rise is fast fail, fast correct Klarner, Treffers, and Picot (2013). For this to occur it is necessary to stimulate creativity, teamwork, multifunctional teams. In this sense, Maranhão et al. (2015) and Shirahada and Hamazaki (2013) treat risk management as factors that can be managed through collaborative strategies and approaches such as open innovation and crowdsourcing; beyond mathematical, statistical and logical tools. Another methodology used in project management is the Heuristic Redefinition Process (HRP), joined the business process reengineering, design thinking and lateral thinking are linked to organizational change. Heuristics can be used to improve processes as well as to create ideas, helping to highlight and reinforce the relationships between processes and the global strategy. In this process, lateral thinking contributes to the use of non-traditional practices and methods aiming at the development and implementation of innovations. In addition, the reengineering seeks to allocate the changes in the processes and ideas proposed by Heuristics, as well as the improvements coming from lateral thinking. The approach developed by the Helical Model is suitable for volatile environments, where improvement and creativity must be constantly triggered according to Maranhão et al. (2015), so that this occurs the information management systems have to contribute with local or online platforms through spaces sharing on the internet. For Peng, Zhang, Fu, and Tan (2014) today's organizations cannot have great success without information technology, because good use of the information technology (IT) can improve business operations. Organizations differ in the ways they use IT, but in general, they provide employees with a digital platform to facilitate and better implement internal processes.

Salunke et al. (2011) summarizes that new knowledge is generated from the data of previous projects, while understanding value creation is improving overall knowledge to assist in dealing with changes under current market conditions. However, López-Nicolás and Meroño-Cerdán (2011), Nagano et al. (2014), and Wen and Qiang (2016) emphasize the importance of knowledge monitoring for better management. This analysis can be performed by continuously diagnosing process and failure analysis. Because the innovation challenge requires creating new ideas and overcoming technological and market paradigms. It is not about a mechanistic process with standardized inputs and out puts (Nagano *et al.*, 2014).

The Scamper tool as well as the heuristic (process) and the Blue Ocean (strategy) are practices that help to “think differently”, trying to improve reasoning for the overcoming of challenges and stimulation to the creativity. Once created, the scamper tool can use the concept tree to assist in the development of an idea. Şimşit et al. (2014) say that the Heuristic is a technique, but we considering a process because of definition established in this paper. So, in despite this here are its findings: heuristic Ideation [Part of the heuristic redefinition process] is a very efficient group technique that helps to generate new and innovative ideas (Şimşit et al., 2014).

As indicated in the introduction section, project management practices in organizations are increasingly present in the development of projects, because factors such as creativity and innovation

require new ways of managing them. The keys to this stimulation of creativity and innovation are flexibility, agility, communication, sharing of responsibilities, and decision-making to create/maintain an environment conducive to knowledge and research (Beglinger, 2003; Wood & Caldas, 2007; Maximiano, 2011). In addition, traditional project management methodologies and their techniques and tools are often not useful in the management of projects focused on innovation (Badir, Büchel, & Tucci 2012; McHugh & Hogan 2011; Marcelino-Sádaba, Pérez-Ezcurdia, Echeverría Lazcano & Villanueva, 2014). However, the use of new project management practices requires preparation that begins with thorough research, financial and human resources, thus generating the need for an organizational change plan (Ford et al., 2012; McHugh & Hogan, 2011). That is, project management practices alone are not able to prepare organizations for improvement because it is necessary to align them with the purpose of the project, the people and the possible competitive advantages generated. But if they exist it means that some of these aspects are present in organizational environment. In this research it was possible to identify several practices and separate them into strategies (Open Sourcing, Combinational Capability, Eco-innovation and Blue Ocean) processes, approaches and methodologies (Crowdsourcing, PMBOK, Agile approach, Helical model, Information management system, Organic integration, Lateral thinking, Design management thinking, BPR); and among techniques and tools (Episodic learning, Scramper, Brainstorming, Prototyping, Service benchmarks).

Practices identified could also be divided according to their function within project management. There are practices to support management and to stimulate innovation. And innovation practices can be divided in two main: generation of ideas and behavior innovative. In management the common practices are: prototyping, lagomizing, organic integration, information management systems, lateral thinking, helical model, scamper, reengineering process. Practices for the creation of innovative ideas are: open sourcing, crowdsourcing, co-creation, eco-innovation. As results, these practices for management or stimulate innovation provide guidelines for aligning project management with business strategy (Mladenow et al., 2014; Scarpellini et al., 2016).

Regarding the use of project management methodologies as a whole, this research identified the predominance of management through the standards contained in the PMBOK guide, many of which rely on risk management. On the other side, agile methodologies have gained a large dimension by dealing with uncertainties and complexity projects through agile, collaborative and flexible management. The agile approach is also incorporating “design thinking” in terms of product and service design, as well as usability (Ashurst et al., 2012; Lenfle, 2014; Nagano et al., 2014; Marcelino-Sádaba et al., 2014). Therefore, in many cases, successful companies use agile and traditional approaches in parallel. In consequence, the right combination of agile tools and the traditional management concepts could be become a prevalent technique for success projects. Most of the findings are related to processes, approaches and methodologies, in this work there is a lack of additional findings regarding strategies, techniques and tools. It is important to realize that it is possible to use more than one strategy at the time, and combine. In addition, it is also possible the use of a technique in different approaches, and an approach in different strategies.

Dynamic environments, with an emphasis on knowledge, research and development, permeate the innovative organizations. Therefore, it is necessary to work with multidisciplinary teams where flexibility, agility, creativity and innovation is the rule. Therefore, organizations have developed culture based on communication, shared responsibility, and continuous improvement. Thus, the adoption of the practices cataloged by the review, show that organizations of this type, are seeking mechanisms to survive in this new environment still somewhat unknown. In order to do this, they mix existing practices and apply them in a new way, or create others, in order to meet the demands of

the stakeholders. Thus, project management is expanding its scope, besides to manage the phases of the project, it fosters spaces for creativity, cooperation, development and retention of knowledge, as well as respecting people and their particularities, and stimulating diversity as a way to increase creativity and innovation. The adoption of these practices gives new meaning to project management, something more holistic, making the best use of resources and achieving better results.

5 Conclusions

Project management practices are increasingly becoming more popular in the organizational environment, driven mainly by the use of information technology and the extremely dynamic environments. Considering the great number of existing practices, it becomes fundamental to pay attention to the purpose of the project, its human potential and the competitive advantages assessment generated for choose what can best fit the company and the management of its project. The main contribution of the article was the attempt to organize the practices according to their purpose or function. As for function, they can support management as well as stimulate innovation. Already like purpose, they can be strategies, approach or techniques. However, this classification depends on the conceptual theoretical basis used, so these classifications may change if another conceptual perspective is used. In this way, the theoretical perspective becomes a limitation, since that different concepts can generate a different classification. Even though, those classifications by purpose and function could be help for organizations and managers that combining practices to reduce failures and improve their performance.

The most cited practices were: episodic learning, crowdsourcing, multifunctional team, open source, combinatorial ability, co-creation and HRP. This demonstrates that companies today are concerned with their staff, structure, climate and organizational culture. For this, they surround themselves with people with a diversity of skills and professional / business partnerships, in order to get diversity of inputs. Overall, this review helps support project management in organizations because it warns that practices are likely to be most effective when there is a combination generating the best management results. For example, the open sourcing strategy combines approaches when using crowdsourcing and the information management system; another example is the combinatory capability combining agile methodology and thinking design, and the latter combines prototyping with lagomizing.

One of the limitations of this paper is related to the narrowing of the vision, since only the works that responded directly to the issue proposed by the systematic review were considered, so it is not possible to generalize the results found. Another limitation may be the delimitation of time space in five years perhaps considering a longer period of time the results could be different. A third limitation is the conduction of empirical studies to evaluate if the findings are consistent with the current state of the companies. The last limitation refers to the identification of only two functions to classify practices. Thus, future papers can overcome all the limitations raised. The identified practices can form a toolbox. If they can be used alone or combined, there is no manual to determine so. Currently, research has shown that some practices have better results if combined with others; practices must be tested, and should always aim to support project management in innovative organizations.

Acknowledgment

Coordination for the Improvement of Higher Education Personnel (CAPES).

References

- Artto, K., Kujala, J., Dietrich, P., & Martinsuo, M. (2008). What is project strategy? *International Journal of Project Management*, 26(1), 4–12.
- Ashurst, C., Freer, A., Ekdahl, J., & Gibbons, C. (2012). Exploring IT-enabled innovation: A new paradigm? *International Journal of Information Management*, 32(4), 326–336.
- Badir, Y. F., Büchel, B., & Tucci, C. L. (2012). A conceptual framework of the impact of NPD project team and leader empowerment on communication and performance: An alliance case context. *International Journal of Project Management*, 30(8), 914–926.
- Beglinger, J. (2003). The innovative organization for the 21st century. *Nurse Leader*, (January/February), 39–41. [https://doi.org/DOI: 10.1016/S1541-4612\(03\)70073-1](https://doi.org/DOI: 10.1016/S1541-4612(03)70073-1)
- Biolchini, J. C. de A., Mian, P. G., Natali, A. C. C., Conte, T. U., & Travassos, G. H. (2007). Scientific research ontology to support systematic review in software engineering. *Advanced Engineering Informatics*, 21(2), 133–151. <https://doi.org/10.1016/j.aei.2006.11.006>
- Bonesso, S., Comacchio, A., & Pizzi, C. (2011). Technology sourcing decisions in exploratory projects. *Technovation*, 31(10–11), 573–585.
- Brereton, P., Kitchenham, B. A., Budgen, D., Turner, M., & Khalil, M. (2007). Lessons from applying the systematic literature review process within the software engineering domain. *Journal of Systems and Software*, 80(4), 571–583. <https://doi.org/10.1016/j.jss.2006.07.009>
- Chou, D. C., & Chou, A. Y. (2011). Innovation outsourcing: Risks and quality issues. *Computer Standards and Interfaces*, 33(3), 350–356. <https://doi.org/10.1016/j.csi.2010.10.001>
- Dodgson, M., Gann, D., MacAulay, S., & Davies, A. (2015). Innovation strategy in new transportation systems: The case of Crossrail. *Transportation Research Part A: Policy and Practice*, 77, 261–275.
- Eweje, J., Turner, R., & Müller, R. (2012). Maximizing strategic value from megaprojects: The influence of information-feed on decision-making by the project manager. *International Journal of Project Management*, 30(6), 639–651.
- Ford, R. C., Edvardsson, B., Dickson, D., & Enquist, B. (2012). Managing the innovation co-creation challenge: Lessons from service exemplars Disney and IKEA. *Organizational Dynamics*, 41(4), 281–290. <https://doi.org/10.1016/j.orgdyn.2012.08.003>
- Hazir, Ö. (2015). A review of analytical models, approaches and decision support tools in project monitoring and control. *International Journal of Project Management*, 33(4), 808–815.
- Hittmár, Š., Varmus, M., & Lendel, V. (2014). Proposal of Model for Effective Implementation of Innovation Strategy to Business. *Procedia - Social and Behavioral Sciences*, 109, 194–198.
- IPMA. (2015). IPMA Competence Baseline (ICB), Version 4.0. International Project Management Association. <https://doi.org/10.1002/ejoc.201200111>
- Klarner, P., Treffers, T., & Picot, A. (2013). How Companies Motivate Entrepreneurial Employees: The Case of Organizational Spin-Alongs. *Journal of Business Economics*, 83(4), 319–355.
- Kostalova, J., Tetreanova, L., & Svedik, J. (2015). Support of Project Management Methods by Project Management Information System. *Procedia - Social and Behavioral Sciences*, 210.
- Lenfle, S. (2014). Toward a genealogy of project management: Sidewinder and the management of exploratory projects. *International Journal of Project Management*, 32(6), 921–931.
- Lewrick, M., Link, P., & Lewrick, M. (2015). Design Thinking Tools : Early Insights Accelerate Marketers ' Success. *Marketing Review St. Gallen*, (1), 40–50.

- López-Nicolás, C., & Meroño-Cerdán, Á. L. (2011). Strategic knowledge management, innovation and performance. *International Journal of Information Management*, 31(6), 02–09.
- Manohar, S. S., & Pandit, S. R. (2013). Core Values and Beliefs: A Study of Leading Innovative Organizations. *Journal of Business Ethics*, 1–14. <https://doi.org/10.1007/s10551-013-1926-5>
- Maranhão, R., Marinho, M., & De Moura, H. (2015). Narrowing Impact Factors for Innovative Software Project Management. *Procedia Computer Science*, 64, 957–963.
- Marcelino-Sádaba, S., Pérez-Ezcurdia, A., Echeverría Lazcano, A. M., & Villanueva, P. (2014). Project risk management methodology for small firms. *International Journal of Project Management*, 32(2), 327–340. <https://doi.org/10.1016/j.ijproman.2013.05.009>
- Maximiano, A. C. A. (2011). *Teoria Geral Da Administração: Da Revolução Urbana À Revolução Digital*. São Paulo: Atlas SA.
- McHugh, O., & Hogan, M. (2011). Investigating the rationale for adopting an internationally-recognised project management methodology in Ireland: The view of the project manager. *International Journal of Project Management*, 29(5), 637–646.
- Mladenow, A., Bauer, C., & Strauss, C. (2014). Social crowd integration in new product development: Crowdsourcing communities nourish the open innovation paradigm. *Global Journal of Flexible Systems Management*, 15(1), 77–86.
- Morris, P. W. G. (1990). The strategic management of projects. *Technology in Society*, 12(2), 197–215. [https://doi.org/10.1016/0160-791X\(90\)90008-Z](https://doi.org/10.1016/0160-791X(90)90008-Z)
- Nagano, M. S., Stefanovitz, J. P., & Vick, T. E. (2014). Innovation management processes, their internal organizational elements and contextual factors: An investigation in Brazil. *Journal of Engineering and Technology Management - JET-M*, 33, 63–92.
- Ning, Y. (2017). Selecting client’s project control strategies in person-to-organization transactions. *International Journal of Project Management*, 35(2), 212–220. <https://doi.org/10.1016/j.ijproman.2016.11.003>
- Peng, J., Zhang, G., Fu, Z., & Tan, Y. (2014). An empirical investigation on organizational innovation and individual creativity. *Information Systems and e-Business Management*, 12(3), 465–489.
- PMI. (2013). *A guide to the project management body of knowledge (PMBOK® guide)*. Project Management Institute. <https://doi.org/10.1002/pmj.20125>
- Salunke, S., Weerawardena, J., & McColl-Kennedy, J. R. (2011). Towards a model of dynamic capabilities in innovation-based competitive strategy: Insights from project-oriented service firms. *Industrial Marketing Management*, 40(8), 1251–1263.
- Scarpellini, S., Valero-Gil, J., & Portillo-Tarragona, P. (2016). The “economic-finance interface” for eco-innovation projects. *International Journal of Project Management*, 34(6), 1012–1025.
- Shirahada, K., & Hamazaki, K. (2013). Trial and error mindset of R&D personnel and its relationship to organizational creative climate. *Technological Forecasting and Social Change*, 80(6), 1108–1118. <https://doi.org/10.1016/j.techfore.2012.09.005>
- Şimşit, Z. T., Vayvay, Ö., & Öztürk, Ö. (2014). An Outline of Innovation Management Process: Building a Framework for Managers to Implement Innovation. *Procedia - Social and Behavioral Sciences*, 150(231), 690–699. <https://doi.org/10.1016/j.sbspro.2014.09.021>
- Stingl, V., & Geraldi, J. (2017). Errors, lies and misunderstandings: Framing the literature on decision behaviour in projects. *International Journal of Project Management*, 35(2), 121–135.
- Vergara, S. C. (2016). *Projetos e relatórios de pesquisa em administração*. São Paulo: Atlas S.A.

Wen, Q., & Qiang, M. (2016). Coordination and Knowledge Sharing in Construction Project-Based Organization: A Longitudinal Structural Equation Model Analysis. *Automation in Construction*.
<https://doi.org/10.1016/j.autcon.2016.06.002>

Wood Junior, T., & Caldas, M. P. (2007). *Comportamento organizacional: uma perspectiva brasileira*. São Paulo: Atlas SA.