

THE APPLICATION OF AGILE METHODOLOGY IN THE PUBLIC SECTOR: LIMITS AND CHALLENGES

Humberto Barboza

He holds a Master's in Public Administration from EBAPE-FGV, MBAs in Actuarial Science and Business Management from FGV, Quality / Software Engineering from UFRJ and a Bachelor's Degree in Information Systems. In International Schools he was a fellow of the first of the International Program of Governance and Political Management of George Washington and FGV. He studied Innovation, Leadership, Project Management and Design Thinking in Barcelona at ESADE, and at TIAS in Utrecht. He recently completed the Binational LLM in Privacy and Data Protection at the Escola Superior do Ministério Público do Rio Grande do Sul, where he studied the LGPD - General Data Protection Law, studying GDPR (General Data Protection Regulation) at ``Universidade de Lisboa``. He has some international certifications in the areas of projects, software quality and Privacy and Data Protection. He is majoring in Business Administration at UFRRJ-`` Universidade Federal Rural do Rio de Janeiro``
[linkedin.com/in/humbertobarbozaprojeto](https://www.linkedin.com/in/humbertobarbozaprojeto)
<http://lattes.cnpq.br/3840256648799061>

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



Abstract: This study aims to identify the limitations that the characteristics of the public sector bring to the use of agile methodologies. Based on the construction of a framework dealing with the formalistic and bureaucratic characteristics of public administration and its limitations in the adoption of less structured management technologies, a semi-structured interview was carried out with specialists, technicians and managers, who had the opportunity to work with agile methodologies in the public and private sectors. The results obtained allowed us to signal the barriers inherent to the implementation of these methodologies and agile methods in the public sector, understood as a proxy for flexible planning models. The survey of the theoretical framework indicated that knowledge about the use of agile methods in the public sector is still relatively incipient, so this study hopes to contribute to broadening the understanding and limitations regarding its use.

Keywords: Agile Methodologies. Public sector. Organizational culture. Difficulties. Innovation.

INTRODUCTION

The significant expansion of the Information Technology (IT) area in the 21st century has made companies learn to use an increasing number of *software* in different sectors with the objective of making their facilities and processes more modern, in addition to achieving the customer loyalty through an agile and practical service of excellence (VACARI, 2015).

In this competitive scenario, new systems are created and tested along with the growing demand for changes and innovations in existing ones, with increasing urgency in finalizing the process. Modernity and speed (RASSWEILER, 2015; AGOSTINHO, 2015).

Most customers are not aware of the

complexity of functionalities that are basic requirements for the implementation of a new system that is most appropriate to meet the expectations of their company. Therefore, they disregard and/or are unaware of the data collection phase and its importance for the entire process. In the traditional methodology, the next step is to read lengthy contracts full of technical terms causing irritation to customers. *Software* development companies have done otherwise: a short term for project implementation with smaller steps, monitored and tested with customers (RASSWEILER, 2015).

It is important to emphasize that Agile *Software* Engineering can be considered a combination of philosophy and development principles in which simplicity in development prevails, with the main objective of customer satisfaction, using strategies for the involvement and enthusiasm of the team (team of development). In this product construction process, internal communication within the team and external communication with the customer is an absolute priority, valuing deliveries at each stage (PRESSMAN, 2011).

It can be said that in the development of information technology systems, change is daily, that is, one of the great challenges is to understand and respond to customer requests, which, in most cases, do not have a closed/clear idea of the product design, so that the project evolves and the impact generated is not a problem but a solution, thus avoiding consequences such as: budget overrun, unfulfilled scope, delay in transforming orders into deliveries or low quality in the final product (RISING & JANOFF, 2000; PRESSMAN, 2011).

One of the alternatives to these possible difficulties in the development process is to value the involvement and engagement of the client, thus creating an atmosphere of interaction with the project team, better

management of changes with deliveries occurring more frequently and in small parts. Furthermore, these *software* fragments are shown working, but not necessarily in production (TAVARES, 2008; SILVA, 2009).

In this new scenario, projects are considered from this perspective where the application of agile practices and principles has as values the practice of agility, ensuring greater adaptability and transparency in the various phases and throughout its life cycle, with the objective of support the continuous improvement of the process and the team, these being critical success factors (EDER et al, 2014).

However, there are difficulties and limits, especially in the public sector. What constitutes the essence of this research is that numerous authors work with categories that will be presented for analysis in the interviews, supporting this hypothesis and confirming it. In the last decade, agility and efficiency in customer service stood out in the competitive and creative market. Therefore, companies have invested in project management and the use of methodologies that can act in this challenging and dynamic scenario (SILVA, 2009).

In long-term projects, many unforeseen events can happen during the development cycle due to factors such as: lack of information, as well as inadequate communication between team members and relationships with other *stakeholders*, resulting in poorly designed processes and poor implementations. Therefore, it is always necessary to eliminate threats such as: lack of attention, non-compliance with requirements and delays in achieving the final objectives of the project (SILVA, 2009; PRESMANN, 2011).

The traditional model, created with reference to the industrial model, follows determinism, believing in the reduction of errors and time, but these traditional

methodologies have received criticism and questioning due to two factors: limitations and insufficiencies, above all, in dynamic business environments (EDER et al, 2014).

On the other hand, there are countless creative Information Technology professionals developing work with constant changes and adaptations to the requirements and requirements of customers, using different approaches in project management (AGOSTINHO, 2015).

For this article, an exploratory research was carried out with the objective of identifying the limitations that the characteristics of the public sector bring to the use of agile methodologies.

The research is relevant as the use of agile methodologies is increasingly common in the private sector, directly impacting the positive results of companies. However, in the public sector there are numerous limitations and challenges.

The research was limited to professionals who work in the Brazilian market. Thus, it will be possible to understand the perception of the application of the agile methodology in the national public sector, establishing an overview of its main characteristics, its challenges and its expectations. All had experience in or with the public sector.

THEORETICAL FRAMEWORK

AGILE METHODOLOGIES

In the 1990s, this methodology emerged with the proposal to reduce bureaucracy in *software* creation processes. The term became popular, giving rise to the “Agile Manifesto” in the 2000s, with common principles shared by these methods (AGILE, 2001); (AGOSTINHO, 2015):

In the 2000s, leaders of the extreme programming community got together and discussed XP practices and the relationship

between XP and Lightweight Methods (SCRUM, DSDM, Adaptive Software Development, Crystal, Feature-Driven Development, Pragmatic Programming, etc). The light methods presented a lighter and less bureaucratic approach. Thus, it was concluded that XP was better as a specific method, however, with some common characteristics between it and the lightweight methods. During the meeting, parameters for software development methods were established. The Agile Software Development Manifesto was created, or simply the Agile Manifesto. Source: <http://www.metodoagil.com/manifesto-agil/>. Accessed on: October 12, 2019.

Agile methodologies (AM) value adaptation to changes during the project development cycle, flexibility in modifying/replacing requirements and transparency with the use of tools for both the team and the client, fundamental in scenarios in which the results they will come from a short term and the changes are constant.

Deliveries occur in short development cycles, ranging from 2 (two) to 4 (four) weeks, in which at the end of the cycle the customer receives the most valuable item he himself has chosen among the functionalities presented for development (DANTAS, 2003), (see figure 1).

It is important to highlight that agility is the ability to respond to changes or the ability to balance flexibility and stability. Thus, the lack of structure or stability favors the creation of a chaotic scenario, but on the other hand, excessive structure generates unnecessary rigidity, that is, a “balance point” is necessary and agile methodologies have this flexibility during the process, greatly reducing the chances of customer dissatisfaction, as he actively participates in the process (HIGHSMITH, 2004; SOMMERVILLE, 2004).

Summerville (2004) listed principles that summarize the values of these methodologies.

The agile “Mindset” is a more dynamic way of thinking and developing projects that can be applied throughout the software process, but it is essential that the team is in an environment favorable to continuous improvement, in which everything that is not the product in development will need to be reduced and simplified, prioritizing deliveries incrementally and with the *software* working (PRESSMAN, 2006); (STEVEN, 2017).

The Agile Manifesto considers the individuals who will use the product, the software delivered and working according to what the customer needs, having the collaboration of customers and responding to changes more important than processes and documentation (KOSCIANSKI, 2007).

Twelve principles summarize this work philosophy in which the team must prioritize the continuous delivery of the product under construction for customer satisfaction and loyalty:

- Our highest priority is customer satisfaction through early and continuous delivery of valuable software.
- Accept requirements changes, even late in development. Agile processes adapt to changes, so that the customer can gain competitive advantages.
- Deliver working software frequently, on a scale of weeks to months, with a preference for shorter periods.
- Business people and developers must work together daily throughout the course of the project.
- Build projects around motivated individuals. Giving them the environment and support they need, and trusting them to do their job.
- The most efficient and effective method of conveying information to and within a

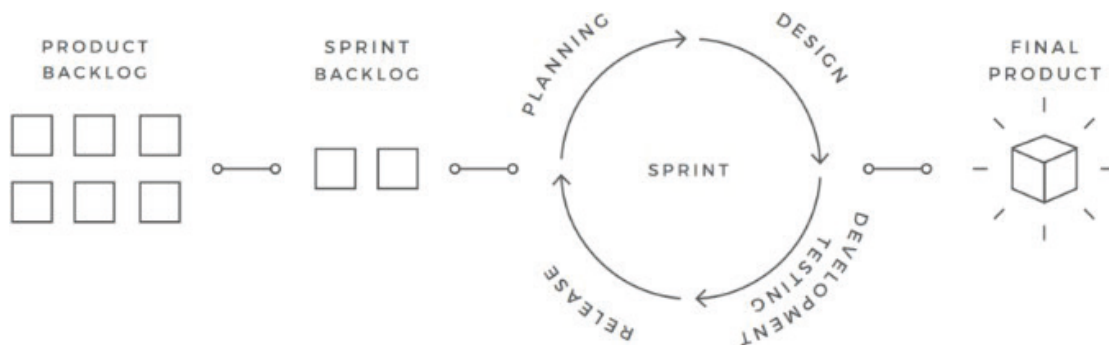


Figure 1: Agile Development Cycle

Source: cdm-consulting.com

THEORETICAL TOPIC (Agile Methodologies)	QUESTION	EXPECTATION REGARDING THE RESPONSE
Organizational Culture: On the formal and bureaucratic model of the Brazilian audience	1. How do you rate the relationship? the use of processes and tools in the Sector Public, rather than privileging interactions between individuals?	Expectation: Identify if processes and tools are more valued that interactions and people.
	2. How do you assess the value relationship between having a Comprehensive documentation or product deliveries working every cycle?	Expectation: Identify if the documentation is more valued than the working product.
	3. How do you evaluate the relationship between the prioritization of customer collaboration and contract negotiation?	Expectation: Identify whether contract negotiation is considered more relevant than customer collaboration.
	4. Is the detailed planning of the project more important than the ability to adapt changes?	Expectation: Identify whether planning is more important than the ability to adapt and respond to change in projects. Whether contract negotiation is considered more relevant than customer collaboration.
Hiring: About the risks in hiring services using agile methodologies	5. Is it feasible to hire software development using agile methodologies in Public Administration	Expectation: Identify the feasibility and ways of contracting software services, for development using agile methods.
Training and Knowledge: About training, interest and motivation for applying the agile methodology	6. About the level of knowledge about agile methodologies in the Public Sector, can this be a limiting reason for its application?	Expectation: Identify whether knowledge about agile methodologies by people working in the Public Sector is still limited and prevents a greater scope in the application.
Scope: About working scope using agile methodologies	7. About the scope, is it possible to work with agile methodologies in fixed scope projects?	Expectation: Identify if the scope is limiting to work with agile methodologies in the Public Sector.
	8. Regarding product requirements and scope, do agile methodologies minimize understanding problems regarding the final product, with the client?	Expectation: Identify whether the use of agile methodologies helps to reduce misunderstandings during the project.

Table 1- List of questions in the interviews

Source: Elaborated by the author.

development team is through face-to-face conversation.

- Working software is the primary measure of progress.
- Agile processes promote a sustainable environment. Sponsors, developers and users alike must be able to maintain constant steps indefinitely.
- Continuous attention to technical excellence and good design increases agility.
- Simplicity: The art of maximizing the amount of work that didn't need to be done.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then adjusts and optimizes their behavior accordingly (Available at: <<https://www.manifestoagil.com.br/principios.html>>. Accessed on: October 12, 2019).

It is necessary to recognize the value of professionals as those responsible for the success of projects with a focus on management effectiveness, results, values and principles of the agile "Mindset". We can mention several agile methodologies: *Scrum*, *XP (Extreme Programming)*, *FDD (Feature Driven Development)*, *Kanban*, *Lean Inception* etc. All are iterative and incremental and follow the previously mentioned agile principles (LARMAN et al, 2003).

This way, agile methodologies have the possibility of carrying out, during the creation process, small tests, meetings, adaptations and corrections until reaching the final product. While the focus of traditional methodologies was the final product with strict planning and budget, in Agile there is flexibility and interaction with the client. In other words, the

focus has shifted from the object to the subject (client).

The first big change is the rapid delivery of value to the customer, that is, even if speed is not a characteristic or technical quality, it will need to be developed and used. In the case of *software*, this can be done in stages in which minimum sets of functionalities are delivered.

Another important aspect is the collaboration between IT and business. In an increasingly competitive and uncertain market, it is essential to bring the IT team closer to managers so that together they can think and propose new ways of working and strategies capable of adding value and innovation to products and/or services. In practice, it means delivering the highest value of the product, a more elaborate step in a short time (STEVEN, 2017).

Two characteristics already mentioned are related to customer satisfaction: delivery of value to the customer in a short time and alignment of the IT team with the products or services: "By making the development process more open for the customer, the implementation of new functionality has become something predictable, transparent and more adherent to customer needs" (VACARI et al, 2014, p. 07).

Another advantage of using Agile Methodologies is the unity of the team and the reduction of dependence on contracted companies. It is true that it is up to the public organization to prepare, train and encourage its employees to start developing new technologies, projects and ideas, significantly reducing dependence on private companies and motivating team members previously focused on bureaucratic work (VACARI et al 2014

AGIL CULTURE TRAINING PROCESS

The organization must develop and consolidate an agile culture so that agile methodologies reach their objectives, that is, so that its employees understand each stage of the project and are committed from the presentation to its conclusion.

It is necessary to impact the organizational culture, as it is the biggest obstacle for any agile methodology. Organizations are social groups that have their own culture, that is, their values, habits and rules that are assimilated by their employees. It has been ingrained in the organization since its founding:

This is a socialization process that takes place over time, presenting beliefs, values, ideologies, habits, customs and norms that generate collective behavior patterns and establish an identity among its members, identifying them with the organization to which they belong and differentiating them. of the others (AGOSTINHO, 2015, p. 26).

However, in the public sector there are countless challenges to be overcome, such as: a lot of bureaucracy, inefficient and inadequate services (in quantity and quality), minimal motivation and complacency of the servants who have their job guaranteed, small investment in improvement or updating courses for they are some examples (FEITOSA, 2016).

It is a context that requires joint efforts to be modified, in which, in most cases, there are insufficient resources and slowness prevails. It is necessary to think about innovation and creativity and promote them. Thus, a question arises: How to transform the human resources of public organizations, many of them for decades in the same function or sector, into a competitive advantage, adding value to the project, creating solutions, suggestions, and with motivation to learn? (VACARI, 2015).

According to Soares (2011), in many cases, there is a conflicting relationship between

1. All authors cited in the text agree on this aspect.

the organizational culture and its practices in organizations, causing difficulties in changes based on projects that use IT. In these cases, suggestions or proposals for implementing an AM must be accompanied by prior knowledge of the organization's culture: sectors, history, projects, in addition to observing the routine of its employees.

Feitosa (2016) explains that innovating is not a simple task, as organizational change only occurs when there are significant changes in the system or in the work environment. In the public sector, resistance is greater, as self-indulgence is associated with stability. Innovation brings "uncertainties and turbulence in the organizational environment that can generate resistance resulting from the individual's withdrawal from a known situation to an unknown situation" (FEITOSA, 2016, p. 04).

IMPLEMENTATION IN THE PUBLIC SECTOR: DIFFICULTIES

It is essential that any project in the public sector has transparency (for example, in invoices, budgets in addition to available quotes) in stages such as: preparation, approval, purchasing sector, as it uses financial resources that are public funds and must have a justification plausible for its use (VACARI, 2015).

For Souza and Renhard (2015) bureaucracy is the most evident and, therefore, implementing agile methods in a public organization is, in general, a slow and complex process insofar as, in most cases, process control is more valued than the search for quick and satisfactory results.

The difficulties for the implementation of Agile Methodologies are found in the organizational culture in which the paradigm shift, when it occurs, is usually slow¹: "while only the *software* development project thinks

and acts in an agile way and the rest of the organization maintains vices and cultures derived from traditional processes, it will not be possible to really enjoy the agile benefits” (AGOSTINHO, 2015, p. 22).

Regarding the structure, there are also “legal limitations and monitoring by legislative, executive, judiciary and regulatory agencies” (SOUZA and RENHARD, 2015, p. 30) making operations difficult with little autonomy of managers when compared to those in the private sector, that is, a high number of authorities and slow bidding and contracting processes that make the whole process slow, according to Vacari (2015):

Agile teams are producing higher quality software that better meets user needs, faster and at a lower cost than traditional teams [Ric08]. This has also led to greater customer satisfaction as well as a greater degree of predictability [Coh11]. Thus, OP² could benefit from these new methods to achieve better results than it would be possible to achieve with so-called traditional methods (VACARI, 2015, p. 15).

Rainey (1997) lists characteristics of the public sector that remain current and very present in the reality of Brazilian (public) companies:

- (a) Great ambiguity, multiplicity and conflict related to objectives, including conflicting objectives.
- (b) Distinctive features of general managerial roles, such as a more political role and exposed to outside political interference.
- (c) Leadership and authority practices, such as, for example, less autonomy and flexibility in decision-making, due to organizational restrictions and external political pressures.

2. The *New Public Management* (NPM) comes from Anglo-Saxon countries and presents solutions for public administration management. At the beginning, these solutions had as their main objective the ability to create/develop mechanisms for adjusting and transferring managerial knowledge from the private sector to the public to reduce the administrative machine and increase its efficiency.

- (d) Organizational structure different from that of the private sector, not necessarily more bureaucratic.
- (e) Strategic decision-making processes more influenced by interventions, interruptions and greater involvement of external authorities.
- (f) Incentive and disincentive structure: increased limitations regarding promotion, reward and disciplinary action. Workers perceive a smaller relationship between reward and performance.
- (g) Individual characteristics, work-related attitudes and behaviors, such as less sensitivity to monetary incentives and higher level of motivation in public work.
- (h) Individual and organizational performance different from the performance found in the private sector. Several studies show public management as less efficient, while others defend its efficiency and general performance (RAINEY, 1997, p. 30).

Undoubtedly, this list presents characteristics of the public sector, such as policy issues, interventions, poor relationship between reward and unsatisfactory individual performance.

There are many obstacles in the public sector, especially since the expansion of *New Public Management*² and, although the provision of public services is the responsibility of the state, it has undergone changes with this new way of managing in which the citizen is the customer, including *e-government* or electronic services. Abel (2017) explains that there is a great difficulty in using agile *software* in OP and that they originate from

the organizational culture and the way servers are used to working innovations with modern tools such as electronics, however, in an archaic way.

METHODOLOGICAL PROCEDURES

The research carried out was of a qualitative nature and the method used was the bibliographic review with data collection through interviews to constitute this field research (YIN, 2015; GODOY, 2005).

DATA COLLECTION

From interviews, data processing was carried out to confirm (or not) the initial hypothesis with rigorous analysis by the researcher followed by diagnostic steps, conclusions and propositions (GODOY, 2005; YIN, 2015).

After the Theoretical Framework, a matrix of categories was chosen based on the principles of agile methods described by Summerville (2004) which are, in fact, suitable themes for structuring the interview questions. Thus, the objective is to prove that the cited theory has relevance and excellent results. Public administration professionals were interviewed. Initially there were more than 20 questions. Similar questions were excluded, leaving eight questions in four thematic groups that will be presented.

The research was carried out by applying the semi-structured interview model with professionals with proven experience in an area related to the subject and all were previously authorized by them and by the agency in which they work, without mentioning the name of the institution. All work in public Brazilian companies.

RESULTS ANALYSIS

To complement the Theoretical Reference with experiences and practices, 15 interviews were carried out with professionals from public, private and mixed economy companies with experience in the implementation of agile methodologies in the public sector and at least 5 years of experience and contact with these management methods.

The survey results were organized into four blocks with the situations that interfere with the implementation of agile methodologies in the public sector: Organizational culture: about the formal and bureaucratic model of the Brazilian public sector; Hiring: about the risks in hiring services using Agile Methodologies; Training and knowledge: about training, interest and motivation for applying the agile methodology; Scope: About how to work the scope using Agile Methodologies.

ORGANIZATIONAL CULTURE: ABOUT THE FORMAL AND BUREAUCRATIC MODEL OF THE BRAZILIAN PUBLIC SECTOR

There are countless challenges that the organizational culture in the Brazilian public sector presents when it comes to the implementation of any type of innovation, including agile methodologies. The results point to bureaucracy (FEITOSA, 2016; AGOSTINHO, 2015) as one of the most significant obstacles to a new dynamic for projects so that they can be modified, adapted and corrected quickly.

There is a constant concern to document each step performed in files that can be consulted later (SOUZA, 2015). In a plaster scenario, innovation and change occur slowly. And, of course, without the participation of the customer. In a long-term project, the probability of errors and inadequacy to what was requested grows (FEITOSA, 2016).

Many young professionals are aware

of the AM, but find it difficult to focus on just one aspect and there is some difficulty in understanding the value of the Agile Manifesto:

“In the public service, documentation is highly valued. Perhaps for contractual or legal reasons. Rigid processes. This turns out to be a problem for using MA. Not that you won't have any kind of documentation, but I'm in favor of documentation that adds value. Document important rules of the product being made” (E11).

Soares (2011) and Rainey (1997) state that it is necessary to know the organizational culture of the company in addition to environmental factors that may limit the use of specific facilitating strategies in the process of implementing agile methodologies as described by the interviewees.

There was alignment between the authors of the theoretical framework with the content of the interviews, mainly based on the following characteristics: proactivity and uneven collaboration among team members; lack of involvement on the part of the team; resistant organizational culture; bureaucracy prevails; breach of negotiated deadlines; little transparency and communication within the team (ABEL, 2017).

HIRING: ABOUT THE RISKS IN HIRING SERVICES USING AGILE METHODOLOGIES

In a bureaucratic organizational culture, one must question the viability of agile methodologies in the public sector. Vacari (2015) lists difficulties in adapting the agile methodology to the public sector, due to its specificity with closed contracts and long-term planning, sometimes years. Therefore, one of the interviewees cited as an example, his company that creates plans for five years and highlighted that in this period, many internal and external (governmental) changes may

occur. In addition, in contracts there are also fines and punishments for errors instead of constant interaction between the client (public company) and the contracted company. On the other hand, there are public companies that successfully adopt Agile, such as Serpro, mentioned by two of the interviewees. E1 highlighted the need and difficulty in the public sector to seek or facilitate customer collaboration:

“The issue of the contract still speaks louder. As if in a job in a highly supervised sector, people are afraid of doing things that are not correct. The contract is a trademark of the public company, “tying you” to the customer” (E1).

E15 states, based on their experiences, that agile methodologies can be used in the public sector with adaptations: “doing as in the quarterly payment approach for *sprints* is not in disagreement with the law and I believe it is possible to apply”, that is, it is necessary to on the one hand, understanding the specificities of the public sector as exemplified by E8 when stating that there are, in some cases, difficulties in the process:

“No way. Here is planning from 2015 to 2020. During this period, the judiciary has 3 terms (every two years it changes). Of course, he is bored. Each manager changes the plan.”

In all cases, the client needs to know and understand the process, committing to it and actively participating in meetings and presentations, adding value to it and reducing the likelihood of future problems that waste time and budget.

TRAINING AND KNOWLEDGE: ABOUT TRAINING, INTEREST AND MOTIVATION FOR THE APPLICATION OF AGILE METHODOLOGY

Regarding the training of IT professionals and other professionals, the answers were quite diverse: for some, the information is easy to access, but they lack interest in knowing and applying something new (SANTOS *et al*, 2010).

This is because guarantee, stability and complacency are rooted in the organizational culture of the public sector, preventing the knowledge and development of these methodologies. Many government agencies already invest in continuing education, but new ideas still find resistance. According to E5, there is no lack of knowledge, but a willingness to change, leading contents and techniques to be shelved:

“Yes. They are because managers have this knowledge, but most are tied to the schedule in Excel. Few people understand what a Sprint is (...). Many are of a certain age and have not done recycling” (E5).

And, for those who already have formal or academic knowledge, they lack the practice and motivation to start it. This is the case for newcomers. Therefore, it is necessary to eliminate subjectivity in estimates; include short breaks between *sprints*; overcome difficulties in maintaining interactions; avoid or reduce the interferences that disturb the real priorities.

SCOPE: ABOUT HOW TO WORK THE SCOPE USING AGILE METHODOLOGIES

The following factors were identified: the scope as a limiting factor in the implementation of the agile methodology for the following reasons: changes during development in the middle of a *sprint*; non-compliance with the *Scrum Master* role; abrupt and sudden change in the system close to the deadline; Customer demands from the team are determining factors in this process that can lead to success (or not).

For some of the interviewees, it is not feasible to work with a fixed scope and innovation. Either something previously determined is followed or it is created and modified throughout the process (SOUZA, 2015). For E14 there are two incompatible practices that need to be known and analyzed throughout the process:

“Not because fixed scope doesn't work in environments that require adaptation. We use agile when the problem is not fully known, in which case we do a front-end approach with design thinking or design sprint or when the problem is known and the solution is not. And in either case there is no fixed scope” (E14).

In relation to the product, the customer's participation is decisive. He will be the user and can suggest the inclusion or exclusion of items that are unnecessary. Therefore, quick and frequent meetings are the basis of the routine for exchanging ideas, criticisms, suggestions and sharing information, leading the project / product to gain functionality requested by customers at the end of the process, which will be of the size and complexity of the project (AGOSTINHO, 2015).

FINAL CONSIDERATIONS

In this work, the main factors necessary for the implementation of agile methods in public organizations were presented based on a theoretical framework and interviews carried out with different actors from the public, private and mixed economy sectors who reported their experiences and difficulties (with and in the public sector) in the process of designing and implementing projects with agile methodologies.

The research included only professionals who work in the Brazilian market, as the objective was to understand and analyze different interpretations and experiences of applying the agile methodology in the national public sector, presenting its main characteristics, difficulties, challenges, expectations and advances, thus adding a diversity of ideas, suggestions and reported examples.

This way, it was possible to identify ideas, suggestions and impressions from the

experiences shared by the interviewees. They are quite diversified, that is, from the most optimistic ones who already perceive an agile movement in that sector to those who see bureaucracy and organizational culture as a broad challenge. Agile methodologies are already present in the public sector, with success in companies such as, for example, Serpro. Also, it was possible to conclude that both in direct and indirect administration the difficulties are the same.

Therefore, projects that applied the agile methodology began to be seen from a new perspective in which agile practices and principles are based on the following factors: interaction with the client, flexibility even in projects with a fixed scope, among others, thus developing greater adaptability, more transparency in its phases, in addition to maintaining, supporting and ensuring continuous improvement of the process, the team and the final result.

REFERENCES

- ABEL, A. Agile software development in the public sector-the case of digital learning resources portal e- Koolikott. 2017. Disponível em: < digi.lib.ttu.ee>. Acesso em: 26 de outubro de 2019.
- AGILE MANIFESTO- 2011 “Manifesto for Agile Software Development”. Disponível em: <http://www.agilemanifesto.org/>. Acesso em: 22 de outubro de 2019.
- AGOSTINHO, M.C. Mitigação de dificuldades na implantação de métodos ágeis de desenvolvimento de software no SERPRO. UFRS: Especialização em Gestão Pública, 2015.
- DANTAS, V. F. Uma Metodologia para o Desenvolvimento de Aplicações Web num Cenário Global. Dissertação. Universidade Federal de Campina Grande, 2003.
- EDER, S., CONFORTO, E. C., AMARAL, D. C., & SILVA, S. L. Diferenciando as abordagens tradicional e ágil de gerenciamento de projetos. São Paulo: Production, 2014.
- FEITOSA, L.V.S, COSTA, C. E. S. Inovações no setor público: a resistência à mudança e o impacto causado no comportamento do indivíduo. V SINGEP Simpósio Internacional de Gestão de Projetos, Inovação e Sustentabilidade. 2016
- GODOY, A.S. Pesquisa Qualitativa Tipos Fundamentais. Revista de Administração da Empresas, Mai/jun. 2005.
- GOMES, F. P.; Araújo, R. D. Pesquisa Quanti-Qualitativa em Administração: Uma Visão Holística do Objeto em Estudo. Seminários em Administração, v.8, 2005.
- HIGHSMITH, J. Agile Project Management, Creating innovative products. Addison Wesley, 2004.

- HIGHSMITH, J. & COCKBURN, A.** Agile Software Development: The Business of Innovation. Computer, 2004.
- KEINERT, T.M.M.** Os paradigmas de administração pública no Brasil (1900-1992). Revista de Administração de Empresas, São Paulo, v.34, n.3, p. 41-48. 1992.
- KOSCIANSKI, A.** Qualidade de Software: Aprenda as metodologias e técnicas mais modernas para o desenvolvimento de software. 2ª ed. São Paulo: Novatec Editora, 2007.
- LARMAN, C.; BASILI, V. R.** Iterative and Incremental Development: A Brief History. In: Computer 36. nº 6, 2003.
- RAINEY, H. G.** Understanding and Managing Public Organizations. 2nd ed. São Francisco: Jossey- Bass Publishers, 1997.
- RASSWEILER, Jens J.; TAILLY, Geert G.; CHAUSSY, C.** Progress in lithotripter technology. *EAU Update Series*, v. 3, n. 1, p. 17-36, 2005. RIGBY, D.K.
- RISING, L.; JANOFF, N.** The Scrum software development process for small teams. In: *IEEE*, v. 17, nº 4, 2000.
- PRESMANN, R. S.** Engenharia de Software: Uma abordagem Profissional. Porto Alegre: Bookman, 2011.
- SILVA, R. F.** Implantação de equipamentos de Manufatura em Indústrias de Bens de Consumo por uma metodologia de gestão de projetos. Monografia. UNITAU, 2009.
- SOARES, L. P.** Cultura organizacional e adoção de práticas ágeis: uma análise exploratória. Porto Alegre: Universidade Federal do Rio Grande do Sul, 2011. Disponível em: <<https://www.lume.ufrgs.br/handle/10183/31950>>. Acesso em: 02 de junho de 2020.
- SOMMERVILLE, I.** Engenharia de Software. São Paulo: Addison Wesley, 2004.
- SOUZA, E.G.; REINHARD, N.** Uma revisão bibliográfica dos fatores ambientais que influenciam a gestão de projetos de sistemas de informação no setor público. Revista de Gestão e Projetos-GeP, v. 6, n. 2, p. 27-41, 2016.
- STEVEN, R.M.** Technology Portfolio Management. For Project Managers. SRM Consulting. Disponível em: <www.standishgroup.com>. Acesso em: 12 outubro de 2019.
- TAVARES, A.** Gerência de Projetos com PMBOK e SCRUM – Um estudo de caso. Faculdade Cenecista Senhora dos Anjos. Gravataí – RS, 2008.
- VACARI, I; PRIKLADNICKI, R.** Metodologias ágeis na administração pública: uma revisão sistemática da literatura. In: Embrapa Informática Agropecuária-Artigo em anais de congresso (ALICE). In: WORKSHOP BRASILEIRO DE MÉTODOS ÁGEIS, 5., 2014, Florianópolis. Resumos. São José dos Campos: INPE, 2014.
- VACARI, I.** Um estudo empírico sobre a adoção de métodos ágeis para desenvolvimento de software em organizações públicas. 2015. Disponível em: <<http://tede2.pucrs.br/tede2/handle/tede/6189>>. Acesso em: 22 de outubro de 2019.
- YIN, R.** Estudo de Caso: Planejamento e Métodos. Porto Alegre: Artmed Editora, 2015.