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Return on Investment of Agile Implementation

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Master in Business Administration

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November, 2021

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Abstract

In the current business environment, companies need to be constantly adapting either to economic circumstances or to the increasingly fast technology advancements to gain competitive advantage. This adaptation comes from Culture and how processes inside a company are managed and Agile appears as the answer for it. Hence, this research aims to determine how worthy is it for a company to adopt Agile Culture in combination with its methodologies and practices, while also considering barriers and success factors of implementation. A series of interviews were conducted with employees from distinct departments, with different roles and ranks of a company that has been implementing Agile, granting a 360-degree view of the implementation. Results reveal that the company improved its multidisciplinary projects by taking down barriers between departments, having a positive impact on its efficiency in delivering value to the client. In addition, it was possible to determine that the employees perceive the implementation of Agile as having a very good impact on their day-to-day work, increasing their motivation.

Keywords: Business Process Management, Return on Investment, Agile Culture, Agile Methodologies

JEL Classification System Code: M14 – Corporate Culture; Diversity; Social Responsibility; O22 – Project Analysis

Resumo

No atual ambiente empresarial, as empresas têm de estar constantemente a adaptar-se quer às circunstâncias económicas, quer aos avanços tecnológicos que acontecem a um ritmo cada vez maior, a fim de obterem vantagem competitiva. Esta adaptação vem da Cultura e como os processos dentro da empresa são geridos e o Agile aparece como a resposta para isso. Esta investigação visa determinar se vale a pena para uma empresa adotar a Cultura Agile em combinação com as suas metodologias e práticas, ao mesmo tempo que considera as barreiras e os fatores de sucesso. Uma série de entrevistas foram conduzidas com colaboradores de departamentos distintos, com diferentes funções e posições de uma empresa que tem vindo a implementar a Agile de forma a ter uma visão de 360 graus do processo. Os resultados revelam que a empresa melhorou o seu trabalho multidisciplinar, derrubando barreiras entre departamentos, tendo um impacto positivo na sua eficiência na entrega de valor ao cliente. Além disso, foi possível determinar que os colaboradores consideram a implementação do Agile um impacto muito bom no seu trabalho diário, aumentando a sua motivação.

Palavras-Chave: Gestão de Processos de Negócio, Retorno de Investimento, Cultura Agile, Metodologias Agile

Classificação JEL: M14 – Cultura Empresarial; Diversidade; Responsabilidade Social; O22 – Análise de Projetos

Index

Acknowledgements	i
Abstract	iii
Resumo.....	v
1. Introduction	1
2. Literature Review.....	3
2.1 Business Process.....	3
2.2 Business Process Management (BPM).....	3
2.2.1 Process Modelling	3
2.2.2 BPM Maturity	4
2.2.3 BPM Life Cycle	5
2.3 Agile	6
2.3.1 Scrum	7
2.3.2 Kanban	8
2.3.3 Scrumban.....	8
2.4 Return on Investment.....	8
2.4.1 ROI Formula	9
2.4.2 ROI Methodology	9
2.4.3 ROI Process Model	10
3. Research Methodology.....	11
3.1 Key Research Question	11
3.2 Sub-research Questions	11
3.3 Research Technique.....	12
4. Data Analysis	15
4.1 Characterization of the Sample.....	15
4.2 Questions Analysis	15
4.2.1 Q1 Analysis	15
4.2.2 Q2 Analysis	16

4.2.3	Q3 Analysis	17
4.2.4	Q4 Analysis	19
4.2.5	Q5 Analysis	20
4.2.6	Q6 Analysis	21
4.2.7	Q7 Analysis	22
5.	Discussion and Findings.....	25
6.	Conclusion.....	29
	Limitations	31
	References	32
	Appendix A	37

Index of Figures

Figure 3.1 - Pereira Problem-Solving Diagram (Pereira et al., 2021).....	13
Figure 4.1 - Word Frequency List – Q1	16
Figure 4.2 - Infographic View of the Answers to Q1.....	16
Figure 4.3 - Word Frequency List - Q2.....	17
Figure 4.4 - Co-Occurrence Network - Q3	18
Figure 4.5 - Infographic View of the Answers to Q3.....	18
Figure 4.6 - Co-Occurrence Network – Q4.....	19
Figure 4.7 - Infographic View of the Answers to Q4.....	20
Figure 4.8 - Word Frequency List - Q5.....	20
Figure 4.9 - "Scale" Word Association - Q5	21
Figure 4.10 - Word Frequency List - Q6.....	21
Figure 4.11 - Text Clustering - Q6.....	22
Figure 4.12 - Bar Chart of Q7	23
Figure 5.1 - Pereira Problem-Solving Diagram with Results of the Research.....	27

1. Introduction

In the last decades, business environment suffered several crises where it was necessary for companies to adapt to new circumstances since these almost always lead to either change in clients' demand, or to problems in the supply chain. Nevertheless, it is not only crises that companies must adapt to, but it is also technology.

With the increasing advancement of technology and the new ways people relate themselves with it, demands that companies also keep up to date to the latest improvements, not only in their core business but globally.

Therefore, companies need to focus on innovation to gain competitiveness while also be aware of the uncertainty of next possible crisis to survive. Considering this thought, some companies are beginning to reshape their culture to become more efficient in their way of work and to deliver the best value in time to their customers. Some companies see Agile as the solution for this.

In the literature review it was possible to find papers regarding the implementation of Agile, its success factors and barriers and how it can improve a company's day-to-day work to bring more value to the customer (Rasnacis & Solvita, 2016; Küpper et al., 2017; Holbeche, 2019; and Beerbaum, 2020). However, literature on the Return on Investment of an implementation of Agile Culture and its methodologies is scarce.

Hence, the main purpose of this study was to determine if it is worthy or not to implement Agile in a company, by analysing how business was conducted before the implementation and after the decision of implementing. Hence, the Key Research Question is: *Is it worthy to adopt Agile in a company?*

To answer the Key Research Question, 20 interviews were conducted to employees of a company that has been implementing Agile. With the interviews it was intended to uncover the history behind the adoption of Agile mainly: the reasons that lead to the adoption, understand what other methodologies or practices were priorly used, the main success factors that facilitated the adoption as well as barriers, the main impacts and, in the end, the interviewees are asked to evaluate the implementation with a Likert Scale of 1 to 10.

Regarding the thesis structure, literature review was intended to address how companies manage their processes to achieve efficiency and the many methodologies, practices, or mindsets to follow. Because in the end it is important to determine if a company will have a

return on what it invested and to measure its success the ROI Methodology was also studied. This methodology not only evaluates an investment based on the pecuniary value invested but also on a qualitative side.

Concerning the Research Methodology, a qualitative analysis was chosen in the form of one-on-one interviews to gather the most relevant data relative to the study. In the chapter “Data Analysis” the content of the interviews is analysed using Text Mining, including tools like Word Frequency lists and Co-Occurrence Networks. Results are discussed afterwards in the following chapter “Discussion and Findings” where the results are interpreted and presented, in addition to describing the contributions for theory and practice. The last chapter is “Conclusion”, where the main findings and contributions will be systematised.

2. Literature Review

2.1 Business Process

A Process is the basis of all business models. They are made of a chain of activities and procedures that help an organisation achieve its goal, transforming inputs and producing outputs to bring value to the customer. Each Business Process has individual goals that are affected by events in chain with other Business Processes (Alotabi & Liu, 2016). Although processes are no longer viewed as merely a chain of activities since companies are gradually viewing Business Processes as an asset where they need to invest in its development (Ongena & Ravesteyn, 2019).

2.2 Business Process Management (BPM)

For a company to run its business appropriately and have a stable organization, having effective and efficient business processes is a key requirement (Arapovic, Biskupic & Juric, 2018). In fact, BPM has grown on that same need, as it offers more options than Business Process Reengineering, where it is expected to focus on solving bottlenecks radically to achieve the desired improvements in cost and quality (Janssen et al, 2015; Klun & Trkman, 2018).

Business Process Management has roots in several highly researched management concepts and is seen by literature as a holistic part of management, with an evolutive definition throughout the decades (Houy, Fettke & Loos, 2010; Klun & Trkman, 2018). BPM is a combination of practices supported by technologies – such as Six Sigma, Lean Management and Agile - that provide and optimizes business processes to increase a firm's capability and intends to align the aspects of the company to the customers' needs, promoting effectiveness and efficiency (Hernaus, Vuksic & Štemberger, 2016; Klun & Trkman, 2018; Ershadi, 2020). It helps companies obtain the agility and maturity to identify possible bottlenecks in a process chain, structures, or systems, linking the inputs to outputs properly by eliminating those bottlenecks (Enriquez, Troyano & Romero-Moreno, 2019).

The end goal of BPM optimization is improving the companies' products and services and add value to the company and the customer (Ubaid & Dweiri, 2020).

2.2.1 Process Modelling

Designing a process model is crucial for BPM. Process Modelling is one of the tools in mapping the interaction of processes throughout the companies and improve through frequent adaptation to cope with emerging needs. This creates diagrams from end to end, describing every process from top management to the operations teams and it is essential in a new business environment

of rapid organizational change and a very competitive market (Martins & Zacarias, 2017; Tbaishat, 2017).

Despite the existence of several other modelling and notation languages, the most used tool in BPM modelling is the Business Process Model and Notation (BPMN) (Wisniewski, Kluza & Ligeza, 2018). The most basic form of this modelling language uses essentially four elements to model Business Processes, which are: lanes; flow objects, such as events (something that occurs during the process), activities (tasks performed), and gateways (control the merge or split of the flow between tasks); and connecting objects (Kluza et. al., 2017; Dumas, et. al., 2018). Furthermore, according to Kluza et. al. (2017), practitioners differentiate BPMN elements according to their degree of detail and by who the model is to be used by. The levels can be descriptive, being this the basic level, analytical, dedicated to professionals who use complex process architectures, and the executable level for technicians.

As a part of the BPM Life Cycle, companies use process modelling to document, redesign and develop new systems and analyse interactions between process owners. This helps understand how the organizations work and help better understand what enhancements must be added to assure continuous improvement (Tbaishat, 2017).

2.2.2 BPM Maturity

Due to the importance of BPM, companies are increasingly increasing investment and development of their processes' maturity. The origin of maturity models is traced back to the Capability Maturity Model and there has been an increase in literature around the subject (Ongena & Ravesteyn, 2019).

Maturity of BPM, as stated by Janssen et al. (2015), is obtained by measuring the company's capabilities to process efficiency. The maturity model used by most companies to evaluate maturity has six key factors (Janssen et. al., 2015; Dumas et. al. 2018):

- Strategic Alignment, which measures the impact and which role business strategy has on BPM and vice-versa;
- Culture aims to identify the extent to which the organization supports the BPM project and its responsiveness to process change;
- People, accounts for those directly involved in BPM projects but also those who are affected by it, but the key take here is acknowledge the training, collaboration and communication needed to develop a successful BPM project;

- Control, delineate BPM roles and responsibilities and assure a performance measurement system;
- Method, how good and effective are the systems of identification and analysis to monitor the BPM project;
- IT is an important part of any BPM project as it will assist technicians in conceiving the process models.

The assumption is that a company with a high BPM maturity will have higher process performance and higher the performance, higher the value added to the organization. This is proven in the paper of Janssen et al. (2015).

2.2.3 BPM Life Cycle

Another concept of BPM is its Life Cycle. As process management strategy is focused on the continuous improvement of business processes, it is important to keep track of each stage of its cycle (Fernández, Fernández & García, 2019). Hence, the BPM Life Cycle was created.

Throughout the years, several BPM Life Cycles were created but the one that is mostly used and referenced in the literature is the one proposed by ABPMP (Costa & Pádua, 2014).

According to Galina & Pádua (2016) and Dumas et. al. (2018), the stages that compose the life cycle are described as follows:

- Planning and Strategy: where it is required that the organisation establishes a process-oriented strategy and plan future BPM decisions;
- Analysis of Business Processes: understand, identify and classify the current process flow by using different methodologies, such as identifying the bottlenecks that need to be solved and what should be done to do so;
- Design: after careful analysis, design new processes, analyse which adjust better to the solution and adjust the specifications that better matches the defined objectives;
- Process Implementation: implement the new model where is necessary process automation, that involves the reconfiguration of an IT system to support the new processes, and organizational change management, the set of activities that must change for the implementation to be successful;
- Control and Monitoring: collect relevant data and compare the results achieved with the objectives planned and suggest changes for continuous improvement;
- Refining: make the considered improvements to achieve a better cycle feedback.

Through this life cycle, it becomes easier for companies to follow the implementation of a BPM initiative (Morais et al., 2014). Although, to properly promote BPM, it is important to factor the external actors that constitute the Critical Success Factors for the implementation of BPM.

2.3 Agile

Agile became relevant in the late 1990's / early 2000's as a more collaborative method for software development when the traditional methods were incapable to deliver high quality products to the clients in time (Brown, 2013). One of those traditional methods that was used was the Waterfall Method that works in an array of plan where a project only starts when the designing phase is completed, assuming a deductive approach (Bhardwaj, Srivastava & Saraswat, 2017; Beerbaum, 2020). This posed several disadvantages for projects as it was challenging for development teams to detect and act upon issues early in the process, adapt to new requirements during the development, hence resulting lower quality products or longer time needed to complete them, in addition to the risk of (Brown, 2013; Beerbaum, 2020).

As a result of these problems, several new methodologies were tested to improve lead time and quality of products that reached the end client, like Scrum and Extreme Programming. To help the spread of agile methodologies, the Agile Manifesto was published in 2001 as a set of 4 values and 12 principles, to help guiding companies towards achieving business agility (Brown, 2013; Campanelli & Parreiras, 2015). Since its publication, Agile practices have been evolving, being the most used methodologies: Extreme Programming, Scrum – the most used one –, Kanban and Lean. Each have their own way of delivering the Agile Manifesto's values and principles (Campanelli & Parreiras, 2015).

Despite its origin in software development, Agile also gained traction in Project Management, especially in environments linked to innovation and prediction and based on the principles of collaboration and communication and practices of how products should be delivered and more than being a methodology, it became a Mindset or a Culture that companies adopted (Küpper et al., 2017; Gannod et al., 2018; Beerbaum, 2020).

Agile functions with iterations called “Sprints” set by a manager during a, usually fixed, daily meeting creating an output-oriented workflow, promoting continuous learning and improvement, communication and collaborative teamwork while also encouraging autonomy and a culture of self-responsibility. This leads to an incremental better product where it is continuously improved through a loop of quick feedbacks until the final product is conceived

and delivered to the client, in addition of a better control over project budget (Brown, 2013; Campanelli & Parreiras, 2015; Gannod et al., 2018; Beerbaum, 2020).

Although its positive effects and scalability, it is complex for a company to adopt Agile (Campanelli & Parreiras, 2015). As several authors noted, Agile implementation success factors include management support, where resistance to change a company's culture can cripple the process as it is important their sponsorship and active involvement, hence the already established culture is considered a success factor; people, as their soft skills are considered very important for the change, since they need training and need to be resilient to overcome the necessary changes; and the customer base (Rasnacis & Solvita, 2016; Küpper et al., 2017; Beerbaum, 2020). Furthermore, Holbeche (2019) states that the shared purpose is one of the most important factors for an organization to be successful the implementation.

2.3.1 Scrum

As mentioned before, one of the most used and well know Agile methodology is Scrum. It was developed in the 1990's as an interactive methodology and incremental approach in software development (Campanelli & Parreiras, 2015).

It follows the principles and values of the Agile Manifesto mainly transparency, adaptation, and close iterations to deliver high quality products in incremental approaches with a multidisciplinary team (Beck et al., 2001; Beerbaum, 2020). Each team has a Scrum Master, the Product Owner, and the Development Team. The role of the Scrum Master is to remove any bottlenecks that might appear and help the project move forward. The Product Owner is responsible for gathering the data that is required for project development and to assign tasks for the team, as well as maintaining the product backlog¹. The Development Team is involved in the activities of the project (Brown, 2013; Bhardwaj, Srivastava & Saraswat, 2017; Mohammed & Karri, 2020).

Scrum is ruled by several events. Before the beginning of any task, a sprint planning is scheduled to determine the tasks the team is going to work on the next 1 to 4 weeks. Throughout the Sprint, the team meets and debates, in so called "Daily Stand-ups", what has been done and what is to do, in order to increase communication and feedback through iteration in an efficient way. At the end of the sprints a retrospective is done, where the team discusses what was done and what was not done, what went wrong and what went well in the sprint. This event requires the team to give honest feedback and open communication, which are values of the Agile

¹ Repository of deliverables that can help the project in the future but are not considered at that moment.

Methodology (Brown, 2013; Rasnacis & Solvita, 2016; Beerbaum, 2020; Mohammed & Karri, 2020)

2.3.2 Kanban

Kanban is one of the oldest methodologies that exist today, dating back to the 1940s. It means “visual card” in Japanese, its country of origin and was first used to improve the Just in Time method used by Toyota’s factories (Saleh, Huq & Rahman, 2020).

The main element that was brought from that early form of Kanban was the Kanban Board. This board is divided by columns of tasks that are due, work in progress and done, guiding the team towards its goals, and avoiding being stuck on meaningless tasks (Brown, 2013; Mohammed & Karri, 2020).

2.3.3 Scrumban

This methodology is a hybrid between Scrum and Kanban methodologies, first mentioned by Corey Ladas, and it combines the features of Scrum, like working in short cycles, with the Kanban’s board to get an overview of the project while the cards gain a rank of priority. This method is widely used in fast paced business environments and specially start-ups (Brown, 2013; Patil & Neve, 2018; Chovanova, Husovic, Babcanova & Makysova, 2020).

2.4 Return on Investment

As mentioned in the topics before, all Business Process Management implementations require an investment in capital made by companies. As costs for these projects that improve the companies’ efficiency grows, they become a target for other departments that seek to increase their own budget at the expense of departments that head BPM projects, so it is important to find the right indicators that sustain their importance (Phillips & Phillips, 2007). Among the most used indicators that measure the return on the invested capital is Return on Investment (ROI).

This metric is used by companies to assess if the return on a certain investment – either a project or an asset, for example – is positive or negative, and how to better use the company’s resources, being this value shown in monetary terms (Phillips & Phillips, 2007; Zamfir, Manea & Ionescu, 2016).

ROI became key to organizational success, using BPM initiatives, controlling losses and focusing on continuous improvement. Companies need to be on a constant search for improvement, to eliminate costs, hence the use of ROI (Hatakeyama & Oliveira, 2016).

2.4.1 ROI Formula

The ROI is calculated by subtracting the *Revenues after the Investment* and the *Amount Invested* (Operating Costs), then dividing the result by the *Amount Invested* and then multiplying by 100 to give a percentage.

$$ROI = \frac{\text{Revenues after investment} - \text{Amount Invested}}{\text{Amount Invested}} \times 100$$

The result from this equation expresses always if a certain investment returns profit or not as a rate (Zamfir, Manea & Ionescu, 2016). For example, if the result is 25% it means that for each 1€ invested in the project, the ROI is 1.25€. Hence, higher the rate more profitable will be the project.

2.4.2 ROI Methodology

As mentioned before, the result of the ROI formula is shown in monetary terms, but there is more into it than just the result. For the ROI analysis to be accurate and add value for decision making purposes, it is important to have a methodology for which data to analyse, what is its objective and the timing for when to evaluate the projects' ROI.

One method that is widely used and recognized is the one created by ROI Institute, which is implemented in most of the Fortune 500 companies, among others, according to their website (ROI Institute, 2021).

According to Phillips & Phillips (2007), this methodology is built in 5 levels of data measurement – from 1 to 5 – and is put a great emphasis on the data monitorisation as it enriches the outcome of the ROI analysis.

The first level, Level 0, is related to the commitment of a company in a project and the activity associated with it – how many people are needed and for how many hours, focus and cost. This type of data is regarded as an intangible benefit, thus not converted to monetary value.

The Level 1 is the Reaction and Perceived Value in which is captured the involvement of the stakeholders in the project, in favour or against, and its relevancy. From this data, the company is already able to iterate on the project implementation.

Learning and Confidence is Level 2, where it is intended to measure the level of skill and knowledge the team project has on the matter to ensure that all team can execute their tasks.

Level 3, Application and Implementation is one of the most important categories and where companies tend to fail implementation. It is at this stage where the measurement of tasks completed, use and successful use of skills is done to assess the as-is of the project.

The next level, Level 4, is called Impact and Consequences. As the name suggests, at this level it is shown the output of the project and isolated the consequences of the project in the company.

The last step, Level 5, is the ROI. At this level, it is shown the monetary benefits of the project compared with the cost of the project, being necessary the conversion of the data gathered in Level 4 to monetary values.

2.4.3 ROI Process Model

To help companies make sense of the data that is collected with the ROI Methodology, Phillips & Phillips (2007) created a model with 3 phases where companies can iterate step by step the aforementioned methodology.

The first phase is called Evaluation Planning, where it is necessary to understand why the project is being done – for example, to improve efficiency in a certain process –, the feasibility of the approach – which defines the needs along the Five Levels and the objectives – and the data collection plan.

The second phase is the Data Collection, where hard and soft data are gathered by surveys, tests, interviews or among other methods of data observation.

After the desired data is collected, begins the third phase, Data Analysis. The first step on this phase is Isolating the Effects of the Project, where strategies are explored to control the output directly linked to the project. This increases the accuracy and credibility of the analysis. The next step is Converting Data to Monetary Values that, as mentioned before regarding Level 4, is a critical step to calculate the ROI as well as Tabulating the Project's Costs and Identifying the Intangible Benefits. The last step of this phase is Calculating the Return on Investment using the formula mentioned before, where the net benefits are divided by the project costs times 100 to give a ratio.

The last phase is Reporting where it is developed report about the impact of the analysis.

3. Research Methodology

3.1 Key Research Question

Literature reveals that Agile helps companies become more efficient in their path of bringing value to their customers by delivering products gradually while also progressively solving issues or adapt products to bring more customer satisfaction.

Hence, this research has the main purpose to determine the Qualitative ROI by answering the Key Research Question: *Is it worth it to adopt Agile principles in a company?*

Therefore, to achieve this goal, sub-questions were defined to help deconstruct the main one and help obtain relevant data to answer the Key Research Question.

3.2 Sub-research Questions

Based on the Literature Review and to achieve the data necessary to answer the Key Research Question, the Sub-questions are the following:

Q1 - What were the main reasons for the implementation of the Agile Culture in the company?

As literature has shown, Agile aims to help organizations achieve efficiency in many ways – either by promoting multidisciplinary teams, promoting more communication or take down barriers between departments. By understanding the main reasons why this company started the implementation of Agile, it is a starting point to understand what were the difficulties that the company felt.

Q2 – What other methodologies were used in the company?

After understanding the pains of the company, with this question it is intended to understand what other methodologies were used and that were not satisfying the needs of the company.

Q3 – What were the main barriers and difficulties felt?

The aim of this question is to understand what the main difficulties were when introducing Agile in the company. As literature shows, a change in a company's culture is a hard task, especially in traditional companies.

Q4 – What were the main success factors?

As literature mentions, some implementations fail when success factors – such as Top Management sponsorship – are not met. Hence, it is important to know which success factors were met during the implementation of Agile in the company.

Q5 – What is the next step towards maturity?

This question aims to understand the next step needed to strengthen the Agile Culture in the company.

Q6 – With Agile, what are the main impacts and gains felt in the company?

After learning about the main barriers and the success factors, it is important to know the impacts that the employees felt after the implementation – if the impacts were positive or negative and what were they.

Q7 – In a scale from 1 to 10, how do you evaluate the implementation of Agile practices in the company?

This final question aims to evaluate the success of the implementation of Agile practices in the company to help reach a Qualitative ROI and conclude if it is worth it or not to implement Agile practices in a company.

3.3 Research Technique

The type of research conducted in this dissertation will be a Qualitative Research approach, since, as Bryman (2016) states, it is the best approach to gather relevant and detailed explanation to a complex problem answering the “why?” and “how?” questions. This will be achieved through a series of structured interviews with employees of a company that started implementing Agile Mindset in 2017. To obtain relevant data, the sub-questions mentioned in the prior sub-chapter were used with the aim of deconstructing the before and after Agile and its impacts, as well as barriers and success factors.

Furthermore, to organize the data retrieved from the interviews and show the global analysis the Pereira Problem-Solving Diagram (Figure 1) will be used. This integrative and intuitive diagram, as mentioned in Pereira et al, 2021, aims to guide businesses and management through problems of inefficiency and ineffectiveness, helping them to find an optimal solution.

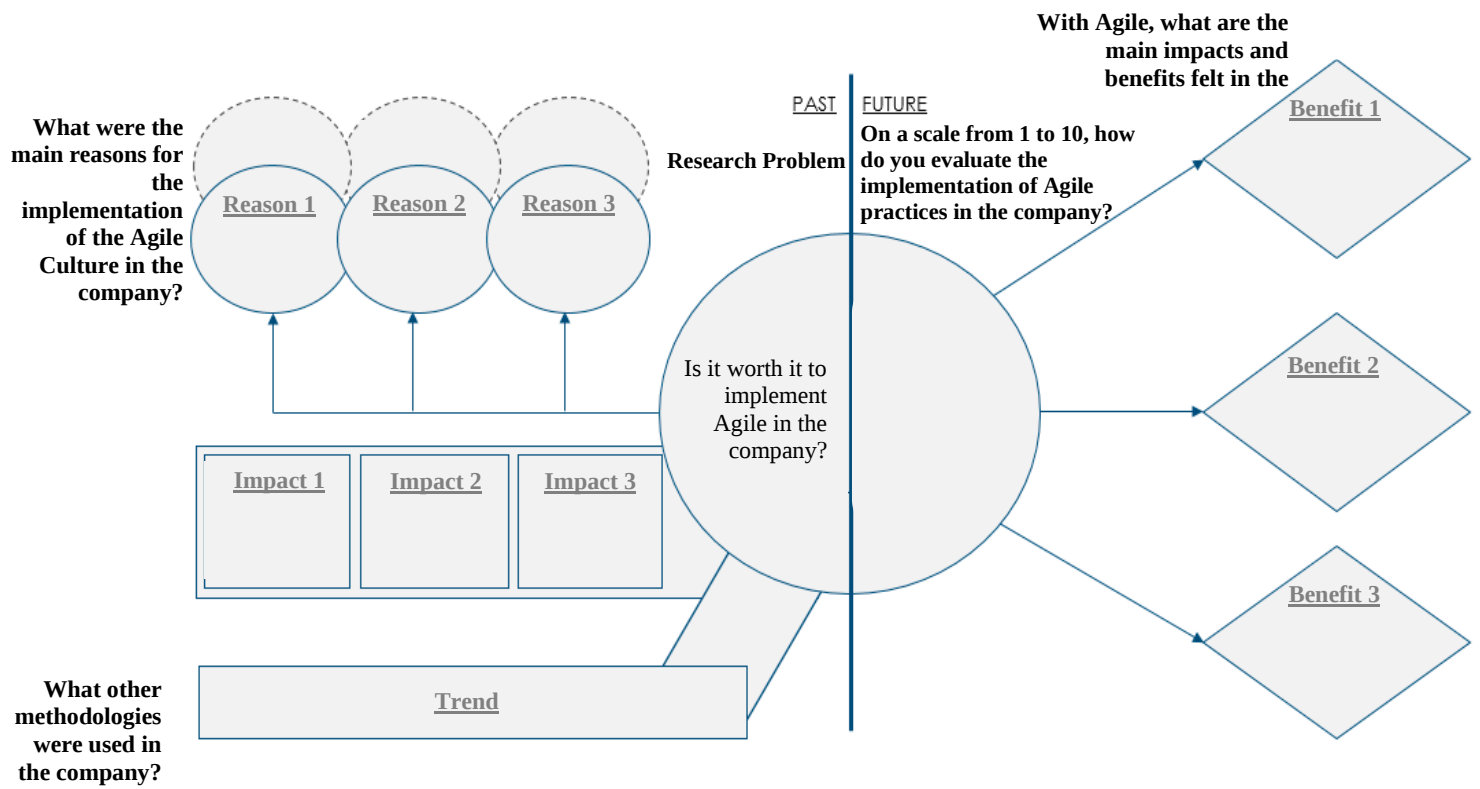


Figure 3.1 - Pereira Problem-Solving Diagram (Pereira et al., 2021)

4. Data Analysis

4.1 Characterization of the Sample

Between the 1st of October of 2021 and the 5th of November, 20 interviews were conducted in one-on-one online meetings and recorded by note-taking.

A non-probability purposive sampling was performed through selection and invitation by the author to each employee. The target population for the interviews were employees of the company that either participated or currently participate in the implementation of the Agile Culture or those whose daily work was impacted by it. Furthermore, it was also intended to interview people from a variety of departments and with distinct roles. The reason for this procedure was to have a 360-degree view of the implementation so that the analysis would not be biased by a top-bottom view or vice-versa. Hence, the functions interviewed were the Chief Executive Officer, the Head of the IT Department, the Head of Business Agility Department and Team Leaders, Product Owners and Professionals from departments such as: IT, Marketing, Contact Centre, Project Development, Operations, Business Agility, Commercial Support and Human Resources.

4.2 Questions Analysis

During the interviews, it was possible to obtain the desired information mentioned above. The interviewees shared their own views and takes on the Agile Culture implementation in the company, granting the 360-view of the topic that was intended to identify and analyse.

The following analysis was carried out question by question using Text Mining and different tools, according to which were more relevant to analyse each question. For some questions, infographics was also used to illustrate and gain more depth of the information obtained during the interviews.

4.2.1 Q1 Analysis

The first question was “*What were the main reasons for the implementation of the Agile Culture in the company?*”.

For this question the tool used to analyse the answers of the interviewees was Word Frequency Table. This tool allows to visualize the words that were most used for this specific question, as it is shown in Figure 4.1.

#	Word	POS / Conj.	Frequency	
1	project	Noun	20	
2	lengthy	Adj	8	
3	client	Noun	6	
4	company	Noun	6	
5	deliver	Verb	6	
6	necessary	Adj	6	
7	need	Noun	6	
8	time-to-market	Noun	6	
9	lose	Verb	5	
10	methodology	Noun	5	
11	business	Noun	4	
12	multidisciplinary	Adj	4	

Figure 4.1 - Word Frequency List – Q1

In Figure 4.2, it can be observed that the most used word was “project” followed by “lengthy”. This shows that the main pain of the company was that projects were too lengthy. Looking more in depth to the answers, due to this pain, the interviewees felt that the company could not deliver the best value to the client as they lost the right time-to-market. Moreover, as shown in Figure 3, it was also mentioned in the answers to this question the “lack of efficient multidisciplinary projects” which is a problem that the Agile Culture intends to tackle and help companies break barriers between teams.

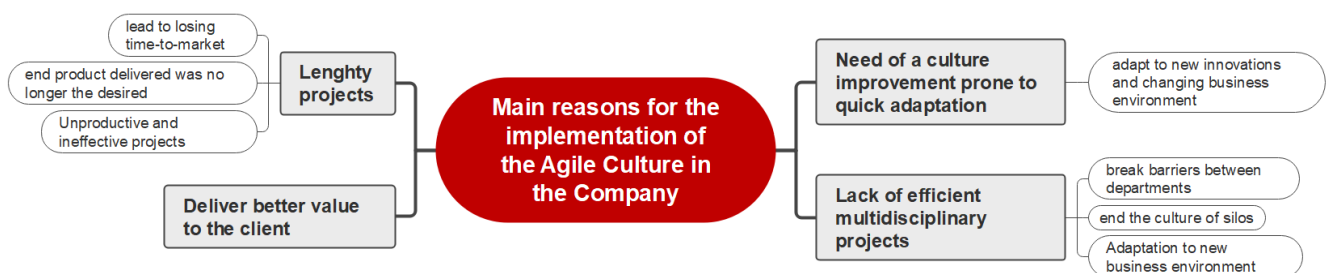


Figure 4.2 - Infographic View of the Answers to Q1

4.2.2 Q2 Analysis

The second question was “*What other methodologies were used in the company?*”.

For this question a simple Word Frequency List was used to analyse which methodology was the most used by the company prior to the introduction of the Agile Culture and Agile Methodologies.

As Figure 4.3 shows, the most common word mentioned was “Waterfall” followed by “tradicional” and “methods”. From this, it is easy to conclude that prior to Agile, the company

used essentially the Waterfall Methodology and other Traditional Methods. These, as already mentioned in the literature review, have some disadvantages such as complexity and lack of iterative practices that lead to lack of quality in delivering value to the customer (Brown, 2013; Beerbaum, 2020).

Despite this, during the interviews was also mentioned that, particularly in the IT department, the Agile Culture is having a spill over effect resulting in several teams working in an Optimized Waterfall.

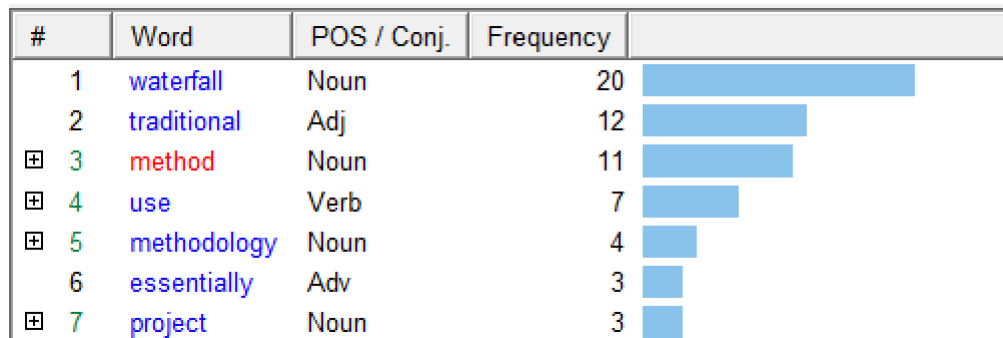


Figure 4.3 - Word Frequency List - Q2

4.2.3 Q3 Analysis

The third question was “*What were the main barriers and difficulties felt during implementation?*”.

For the third question, a new tool in Text Mining was used: The Co-Occurrence Network. This tool is especially important in text analysis because it allows to observe specific patterns and relationships between words that can lead to interesting conclusions (Yan et al., 2019).

The network, in Figure 4.4, is divided by subgraphs and the circles’ size show the frequency that those words are used during the interviews. Analysing the map, it shows the Subgraph 01 with words associated to “time” interlinked with words “lack”, “consuming” and “ceremony”.

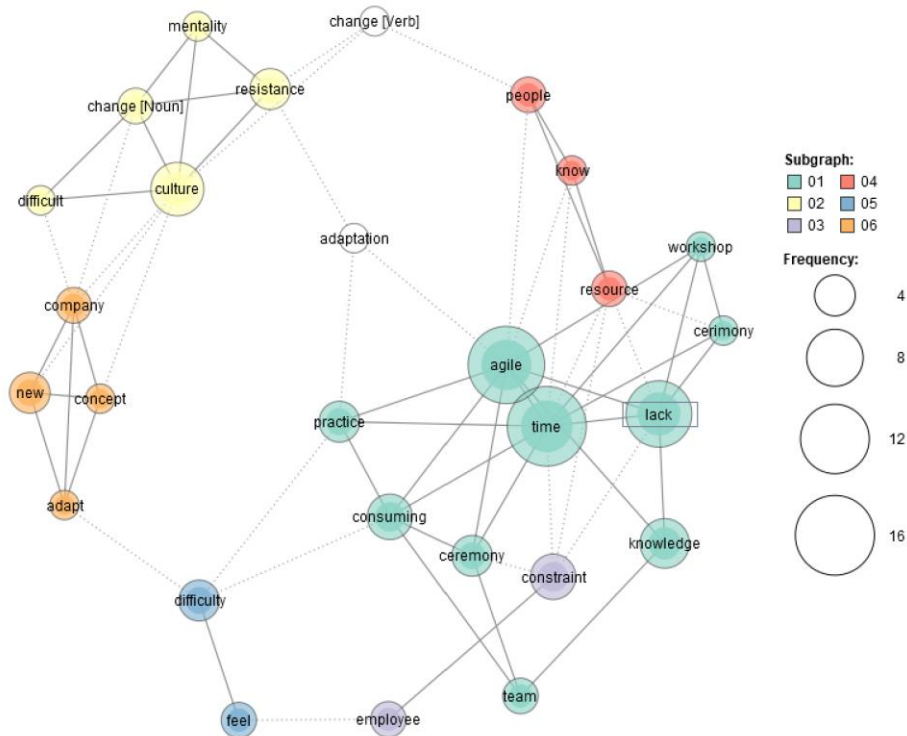


Figure 4.4 - Co-Occurrence Network - Q3

From this we can analyse that one of the difficulties felt by the employees was the constraints in time to accomplish all the ceremonies and practices promoted by Agile.

Regarding Subgraph 02, what is interesting to retrieve from it is interlink of “culture” and “resistance”. This also points to one of the barriers felt by companies, as literature mentions, which is the resistance to change the culture of work that was established for many years.

With Figure 4.5, it is possible to observe the main difficulties felt by the employees. As already mentioned, difficulties related to culture change are well documented (Rasnacis & Solvita, 2016; Küpper et al., 2017; Beerbaum, 2020). “Time constraints” and “New concepts”, according to the interviewees, were essentially felt in the beginning but once the teams felt more involved with the Agile practices these were mitigated.



Figure 4.5 - Infographic View of the Answers to Q3

4.2.4 Q4 Analysis

The fourth question was “*What were the main success factors?*”.

As the analysis to the previous question, for this one a Co-Occurrence Network was also performed (Figure 4.6). Starting with the Subgraph 06, it is possible to see that the word “sponsorship” is strongly interlinked with the word “CEO”, “Executive” and “Committee”. Hence, the important information to retain here is that the sponsorship from the form the CEO and the Executive Committee was one of the main reasons why Agile has been successful in the company. This aligns with literature which states that, for companies to successfully adopt another methodology, it is very important to have the support from top management (Rasnacis & Solvita, 2016; Küpper et al., 2017; Beerbaum, 2020). In this case the support came directly from the CEO.

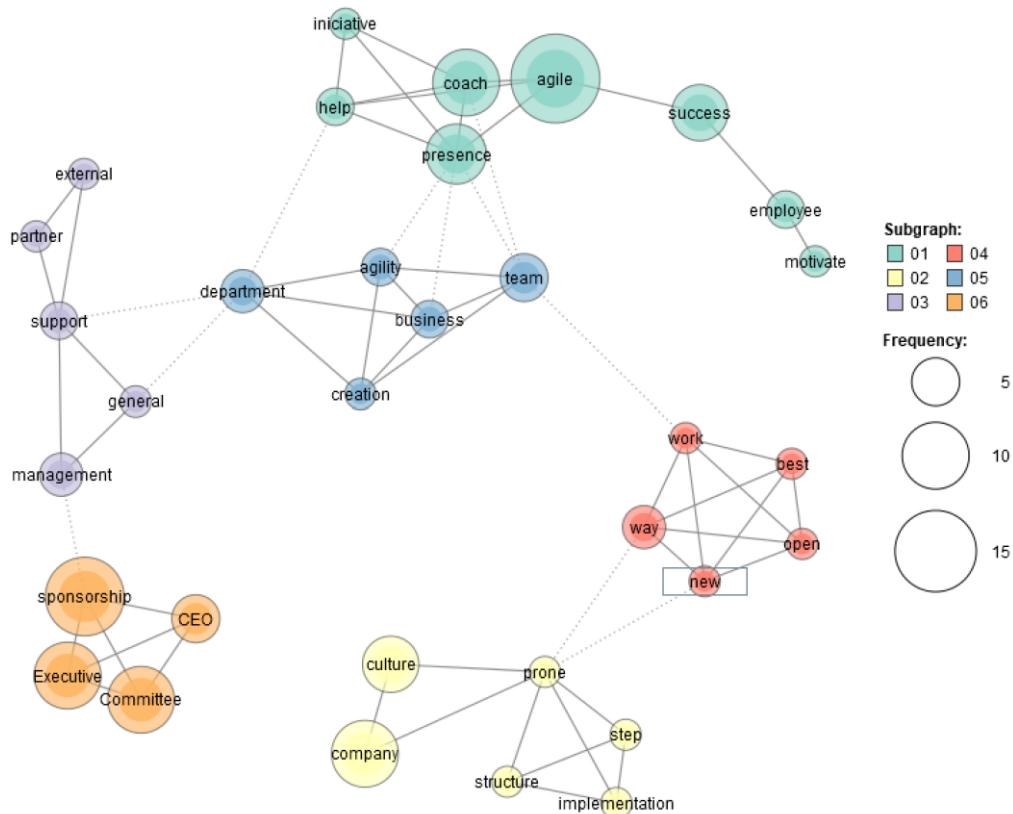


Figure 4.6 - Co-Occurrence Network – Q4

Concerning the Subgraph 01, what comes to attention are the words “agile”, “coach” and “presence”. This results from the fact that many employees reported that the support of Agile Coaches during certain ceremonies and workshops presented by them facilitated the involvement of the teams with Agile. Complementing that success factor, Subgraph 05 shows that the presence of an “agility” “department” contributed for the spread of knowledge of Agile throughout the company.

Lastly, in Subgraph 03, although it has less expression, it was also mentioned the presence of an “external” “partner” as key for promoting Agile inside the company.

The success factors can be seen in depth in Figure 4.7.

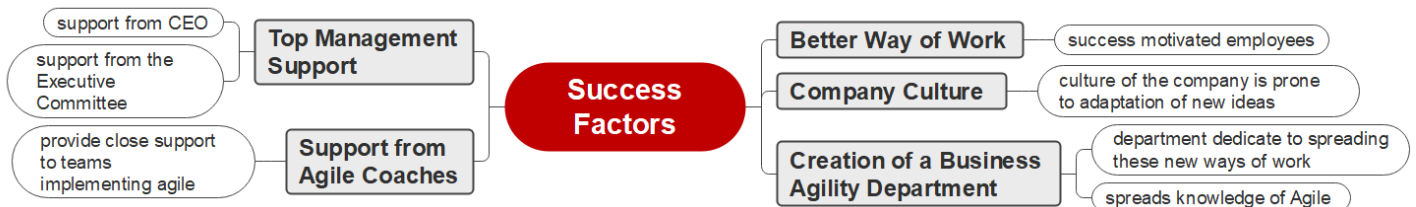


Figure 4.7 - Infographic View of the Answers to Q4

4.2.5 Q5 Analysis

The fifth question was “*What is the next step towards maturity?*”.

For this question the Word Frequency List was also used. As it is shown in Figure 4.8, the most used word was “Scale”, meaning that, for the company to be more mature in Agile, it needs to invest in the scalability of the Agile knowledge throughout the company.

#	Word	POS / Conj.	Frequency	
1	Scale	ProperNoun	15	
2	department	Noun	11	
3	agile	Adj	9	
4	company	Noun	8	
5	area	Noun	3	
6	empowerment	Noun	3	
7	project	Noun	3	
8	promoter	Noun	3	
9	alignment	Noun	2	
10	culture	Noun	2	

Figure 4.8 - Word Frequency List - Q5

To strengthen this affirmation, another tool was used: Word Association. This tool helps unveil which words are most often associated with each other and thus analyse the most pertinent topics mentioned in a qualitative research (Schmitt, 1998). Hence, by performing this analysis with the most frequent word “Scale”, it is mostly paired with “department” and “area” (Figure 4.9).

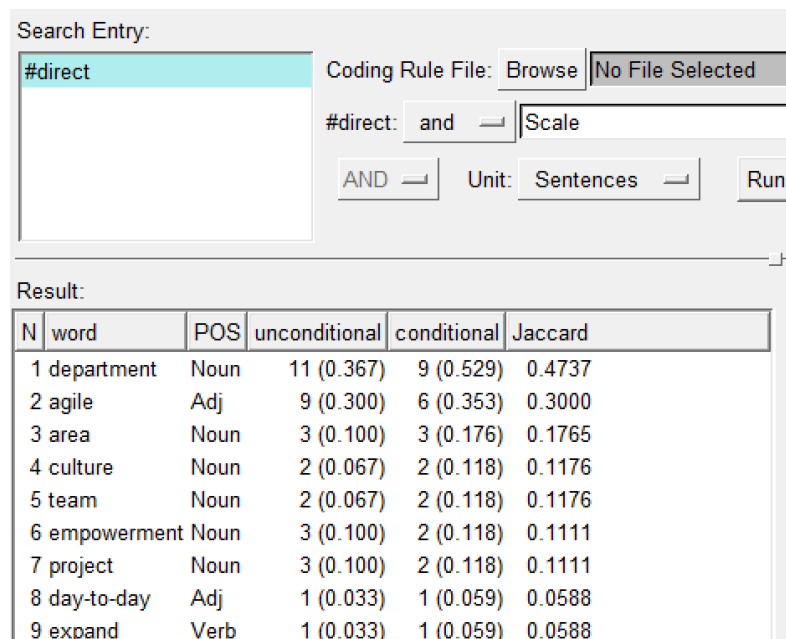


Figure 4.9 - "Scale" Word Association - Q5

4.2.6 Q6 Analysis

The sixth question was *"With Agile, what are the main impacts and benefits felt in the company?"*.

For this question, the Word Frequency List was used to infer what the main topic was. With no surprise, as it is shown in Figure 4.10, "communication" appears as a top benefit felt by the employees of the company, since this is one of the main values the Agile Manifesto promotes (Beck et al., 2001).

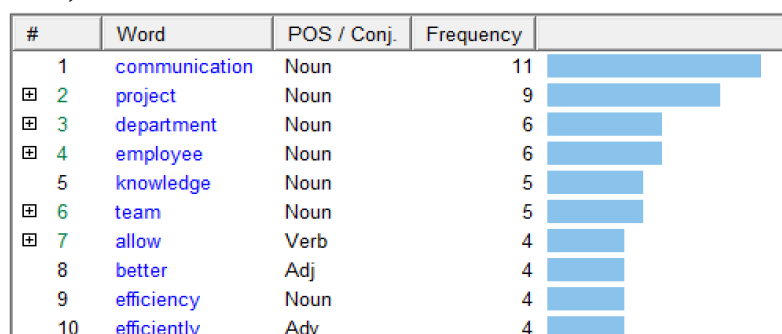


Figure 4.10 - Word Frequency List - Q6

In addition to the Word Frequency List, another type of analysis was performed. For this the Text Clustering was used. This tool allows to correlate all the words associated to the question and follow the links between them.

Hence, by analysing Figure 4.11, it is shown that the adjective "better" is directly linked to "communication" but also linked to "teamwork", which demonstrate improvements in the

company. Analysing the green cluster forward, “motivation” is also linked to “knowledge” and “share” which is also something valued by Agile values.

Furthermore, the biggest cluster (purple) focuses on “project” and here we see that this word is linked to “prioritization”, “efficiently” and “involvement” which were some of the pains mentioned in the first question that needed to be tackled. Looking closer, also shows that the words “approximation” and “department” are linked to the purple cluster, strengthening the affirmation that Agile helped break barriers between departments.

In addition, the blue cluster also strengthens the affirmation that Agile helped in bringing “effectiveness”, “efficiency” and “value”, since these three words are directly linked.

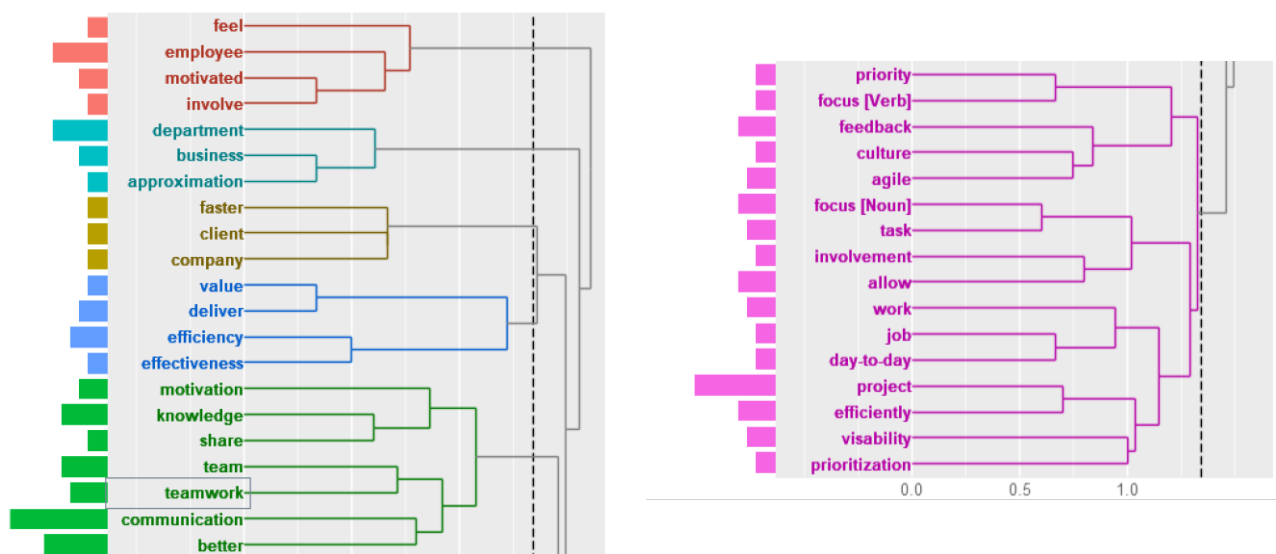


Figure 4.11 - Text Clustering - Q6

4.2.7 Q7 Analysis

The seventh and final question was “On a scale from 1 to 10, how do you evaluate the implementation of Agile practices in the company?”.

From the 20 interviewees, everyone answered this quantitative question. This question aimed at evaluating the employee’s perspective of the implementation in terms of quality where 1 is “Very Poor” and 10 “Excellent”. By descending order, the evaluation was the following: 2 employees answered “9” (10%); 12 employees answered “8” (60%); 3 employees answered “7” (15%); 1 employee answered “6” (5%); 1 employee answered “5” (5%); and 1 employee answered “4” (5%). This data is also plotted in a bar chart in Figure 4.12.

In general, all employees answered positively to their experience with the implementation of Agile and with the Agile practices in the company, always referring that it is still a process and has much room to improve.

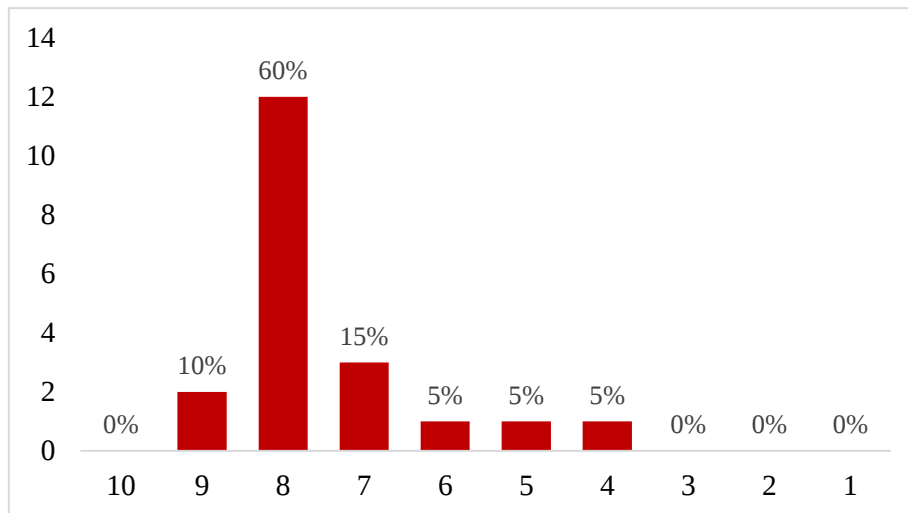


Figure 4.12 - Bar Chart of Q7

Since the data gathered in this question is considered ordinal data, a mean calculation was used as the measure of central tendency in Excel (Jamieson, 2004). The result was 8.

This corroborates with the feedback obtained during the interviews where the employees had a positive view of Agile but still think it can be better adapted to the company as well as extending its knowledge to the whole company.

5. Discussion and Findings

While analysing the literature, a common reason why companies began searching for new ways of working and new ways on how to manage their processes and projects, not only in an efficiently, but also effectively is the need to adapt to market behaviour. This adaptation is highly influenced by new technologies and innovations that have been pouring from every corner of the globe. Hence, companies need a Culture more than just methodologies and this is consistent with the results obtained from the research.

For instance, company's employees report as the main causes for the adoption of Agile the fact that the projects were slow and not too prone to changes while they were undergoing. Of course, in the end, since the process was lengthy and meanwhile market changed, this led to the final product not corresponding to what the customer needs – or, after the product entering the market, it had to be removed due to errors found. Between employees this leads to demotivation because they must do double the job. These are all disadvantages of mentioned by Bhardwaj, Srivastava & Saraswat (2017) and Beerbaum (2020) regarding Waterfall, the methodology most used by the company, as reported by the employees.

In addition, the lack of a common mindset of communication and knowledge sharing across the company did not facilitated multidisciplinary projects inside the company, leading to a culture of silos that posed as a barrier in the project's progress.

While implementation underwent in the company, some barriers were found. One of the barriers was a resistance to a culture shift inside the company. Being a company with many years and with people that have been working there since they first entered the job market, with already deeply established ways of work, this was a tough change. Some employees also mentioned that Agile practices took too much of their time and could not keep up with dailies, weeklies, and retros. Plus, these new concepts and new tools that Agile brought were completely unknown for most of the employees that struggled to learn what they meant and what the supposed outcome was. These difficulties are aligned with the literature (Rasnacis & Solvita, 2016; Küpper et al., 2017; Beerbaum, 2020) which states that the adoption of Agile is a complex process and it requires a lot of work like coaching people in the Agile ways of work, methodologies, and tools.

On the other hand, when employees were asked what success factors contributed positively to the implementation of Agile the majority mentioned the sponsorship of the CEO / Executive Committee. In fact, Holbeche (2019) mentions that one of the main barriers in developing an

Agile Mindset is the “(...) linear thinking (...) and focused mostly on short-term (...)” goals and risk-averse of top management. In this case, it was possible to see that many employees view their top management as a facilitator in this implementation, with openness to failure and learn with that failure.

Furthermore, the interviewees also mentioned the presence of Agile Coaches and the fact that the company created a department dedicated to business agility as two of the main success factors. In addition of showing a great financial effort from the Executive Committee in hiring specialized people in Agile, these two factors tackled one of the main barriers felt by the employees – the lack of knowledge of the concepts of Agile. The Coaches act like teachers of Agile, facilitating, helping teams to get acquainted with the ceremonies and what was their purpose, provide tools and workshops.

Another success factor mentioned was the intrinsic culture within the company. Although some employees stated that there was a cultural shift resistance, some employees also mentioned that once people understood that Agile really helped the company to deliver more quality products to the client, there was a general openness to it.

Finally, another success factor mentioned by the employees was the own success of Agile in the company. When people started to see the results of the implementation, they were motivated to continue with the practices as they saw they were beneficial not only for them individually but also for their department. Interestingly, this was not listed as a success factor in the literature but, as stated by Manganelli et al. (2018), employees that work in a motivating environment, facilitate optimal workplace functioning.

When interpreting the results from the sixth question, regarding the impacts of implementation, it is easy to understand that the impacts were overwhelmingly positive. The most mentioned impact was the fact communication is better, not only inside the departments but also an approximation between the departments. This, of course, facilitates knowledge sharing and the processes become more clearer for every stakeholder. Another consequence of communication is also better teamwork, another impact mentioned by the employees.

As one of the reasons of the implementation was the inefficiency and lengthiness of the projects, Agile came to tackle those problems. Interviewees stated that there is a better prioritisation of the projects, feel more focus and can deliver a better value to the client. This is also possible due to the iteration promoted by the Agile practices, facilitating small adjustments to the product until the final version is reached, granting faster time-to-market. Plus, as it is easier to

keep up with the market expectations, employees feel more prepared to adapt to new innovations.

These impacts corroborate with Rasnacis & Solvita, 2016; Küpper et al., 2017; Holbeche, 2019; and Beerbaum, 2020 on what an Agile company must be: be aware of continuous innovations; be flexible and adaptable; promote engagement between the employees, specially through communication and knowledge sharing.

Regarding what the next step should be to achieve a more mature company in Agile, the unanimous answer was *scalability*. In fact, this is written in literature as one of the advantages of Agile (Campanelli & Parreiras, 2015). Despite being an advantage versus the other methodologies, in large companies – like the one used as a subject – it can be a problem, as mentioned by Boehm et al. (2019). Hence, the company is gradually scaling Agile so that the work done until now is not damaged.

Lastly, when employees were asked how they evaluated the implementation in the company, the majority evaluated with an 8 in a scale of 1 to 10, being 1 “Very Poor” and “Excellent”. Hence, the implementation is perceived very positively by the employees.

Bearing in mind this chapter of analysis and the findings, it is summarized in Figure 5.1.

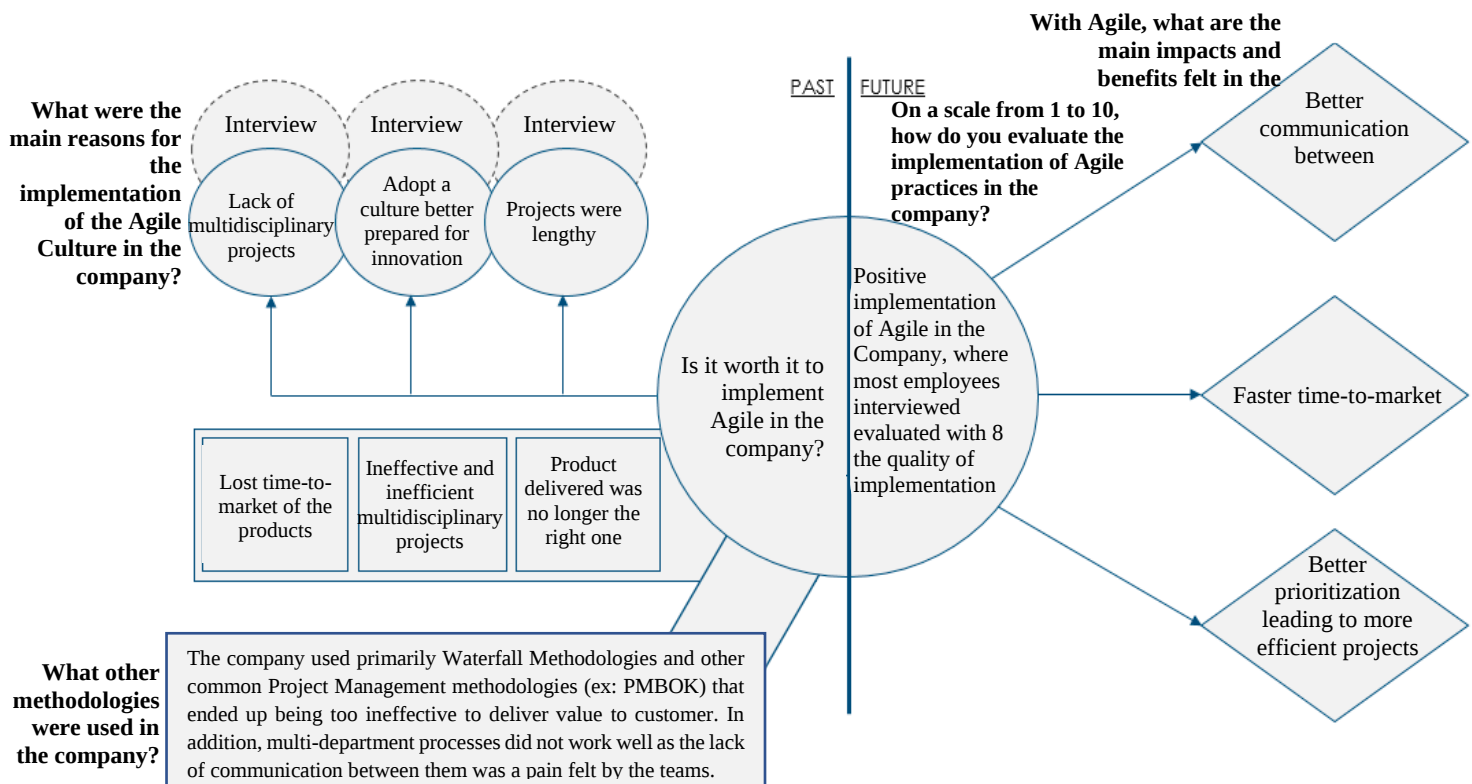


Figure 5.1 - Pereira Problem-Solving Diagram with Results of the Research

6. Conclusion

The present research took a different perspective on the common Return on Investment of an implementation by evaluating not the actual money involved in its investment but evaluating the quality of the implementation. This was done by interviewing 20 employees from different departments and with different roles of a company that began working with Agile in 2017 and across the whole company in 2019.

The results suggest that, with Agile, the company improved its ability to deliver value to the customer by shortening time-to-market of their products while being able, internally, to become more efficient and effective in their projects.

Additionally, despite the barriers that appeared in the way of the implementation, the success factors brought more positive things than the difficulties. For instance, on this topic, it was possible to confirm that the sponsorship of the CEO / Top Management of a company is seen as vital for the successful implementation, among the other factors mentioned in the previous chapter such as investment in Agile coaching and company culture alignment (Rasnacis & Solvita, 2016; Küpper et al., 2017; Holbeche 2019; and Beerbaum, 2020).

In addition, another success factor was mentioned by the employees that is not considered in literature, which is motivation. This was brought up regarding the positive results that the company achieved with Agile, that was visible by all and thus, motivated people to either continue their coaching in Agile or to adopt it.

This research also allowed to validate one of the most difficult things that Agile requires, which is scalability (Boehm et al., 2019). As it is a big company, the scaling of Agile inside the company must be done gradually, hence it is one of the things mentioned by the employees as the next step to achieve maturity.

Additionally, it was also possible to validate literature (Rasnacis & Solvita, 2016; Küpper et al., 2017; Holbeche 2019; and Beerbaum, 2020) that stated the benefits of Agile in the company, especially those regarding efficiency, communication, knowledge sharing, task prioritisation and faster time-to-market due to faster product releases.

Furthermore, this research can be viewed as a steppingstone for companies to start looking equally for the Qualitative side of ROI, in the long term, and not only in the Quantitative side on the short-term.

With all the data gathered, it was possible to infer that Agile Implementation in this company was worthy.

For future research could focus more on accompanying more closely the process of implementation of Agile Culture and its Methodologies in a company and analyse both Qualitative and Quantitative Return on Investment. This way, a more complete assessment could be done and even used as a framework for companies that are thinking of adopting Agile.

Limitations

During the elaboration of this study, some limitations emerged. First, was related to the interviews, it was difficult to schedule with more than 20 people due to time constraints.

On that note, although interviews are considered a great way to obtain quality information, since the company used for this research is a big company, the 20 interviews conducted might be considered short. With a larger sample, the affirmations would have been strengthened or even reach out to more conclusions, especially in the topic of barriers and difficulties.

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Appendix A

Interview Guideline

- 1- What were the main reasons for the implementation of the Agile Culture in the company?
- 2- What other methodologies were used in the company?
- 3- What were the main barriers and difficulties felt?
- 4- What were the main success factors?
- 5- What is the next step towards maturity?
- 6- With Agile, what are the main impacts and gains felt in the company?
- 7- In a scale from 1 to 10, how do you evaluate the implementation of Agile practices in the company?