Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

MANAGEMENT INFORMATION SYSTEMS

MASTER´S FINAL WORK

DISSERTATION

HOW PROCESS UNIFICATION ENHANCES AGILE DEVELOPMENT IN STARTUPS

BY JOÃO MOREIRÃO

10/2024

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SUPERVISION:
JESUALDO C. FERNANDES

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To all the people who
believed in me, yes, we've
finally made it.

GLOSSARY

BPS – Business Process Standardization

SaaS – Software as a Service

TaaS – Transport as a Service

CTO – Chief Technology Officer

UX – User Experience

ERP – Enterprise Resource Planning

SCRUM – (Agile methodology)

ABSTRACT, KEYWORDS AND JEL CODES

This study investigates the application of principles of Business Process Standardization (BPS) and the impact it has on product quality and the development of processes framed within Agile development applied to Company X, a technology startup in the technology and transportation sector present in Brazil, Portugal, Spain, Mexico, and the United States. Based on a qualitative analysis applied in a case study methodology with the assistance of MAXQDA, interviews were conducted with employees of the company in the technology sector. The results indicate a positive impact on product quality, reduction of complexity, and improvement in communication. However, the study also highlights the importance of flexibility as a relevant factor to meet the specific needs of the market.

KEYWORDS: Business Process Standardization (BPS); Agile Methodologies; Digital Transformation; Process Performance; Requirements Management; Operational Efficiency.

JEL CODES: D21; D23; L25; M15; O31; C81.

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1. INTRODUCTION

The mobility sector, as we know it today is undergoing a significant transformation with the advent of technology-based solutions in market models such as Software as a Service (SaaS) and Transport as a Service (TaaS) (Turienzo et al., 2022) . Despite the constant technological growth in the sector, startups – a small, dynamic, flexible, and high-risk companies (Santisteban et al., 2021) - continues to face challenges regarding their rapid development cycles and fast-changing markets. Company X, a technology-driven startup operating in multiple countries, including Brazil, Portugal, the United States, Spain (headquarters), and Mexico, exemplifies this scenario. Working in the technology sector, it struggles to fulfill all the necessary market needs.

While dynamic capability to quickly respond to market changes is a critical factor for the success of technology-driven startups (Santisteban et al., 2021), one of the most common difficulties in this scenario is the lack of internal processes, which creates friction between operations, causing delays and leading to inefficiencies. Moreover, the lack of proper standards among a startup doesn´t allow correct scalability and this can result in poor system performance, necessitating the reengineering or duplication of systems, manpower or processes (Bondi, 2000).

Business Process Standardization (BPS) aims at the unification of procedures and workflows to ensure that companies can operate efficiently and align with strategic goals, improving communication, product quality, and error reduction (Wüllenweber et al., 2008). The objective of applying BPS principles is to achieve a level of process standardization and make processes uniform across the levels of the value chain. By correctly applying these principles within the organization, startups would benefit from better quality, time efficiency, and cost-effective ways of achieving business process goals (Münstermann et al., 2010).

However, the adoption of standardized frameworks and processes can generate resistance especially within startups, particularly in organizational cultures that prioritize flexibility and continuous innovation. Employees and leadership often perceive standardization as a constraint that limits their autonomy and that also reduces their ability to quickly respond to market demands and states standardization creates work that is

physically and psychologically monotonous, which reduces interest in the job, motivation, and creativity (Poksinska, 2007).

This study investigated the benefits of process standardization and the implementation of Business Process Standardization (BPS) techniques in a case study applied to company X. Through semi-structured interviews conducted in an organizational context at different levels of the mentioned startup, the research aimed to understand how the unification of processes enhanced agile development and requirement management. The key research questions intended to be answered included: 1. What are the main benefits of BPS for organizations like company X? In other words, how did BPS function in the startup environment, ensuring strategic advantages and improving the organization in terms of overall product quality, cost optimization, and agility by reducing the time needed to understand procedures and product utilization, while enhancing the way the product was developed and delivered to the customer, particularly in the technological context? Another research question was: 2. "How could BPS improve product quality and operational efficiency?" This question aimed to understand the impact that standardization could have on the overall quality of the product by facilitating developments that became more specific and targeted toward the features the product required. Additionally, 3. "What specific advantages does BPS offer in agile settings?" This question sought to understand if, in agile environments, such as the SCRUM environment emphasized by company X, BPS principles had a more significant impact and better leveraged the benefits of standardization, particularly in the requirement management stage.

By applying the principles of BPS, companies operating in environments like that of Company X, particularly in the context of a growing startup, can benefit from adopting process standardization principles (Harmon, 2014). This approach can enhance requirements management, improve the development team's ability to create new product features tailored to a larger internal audience, and ultimately result in more customer-focused products. Consequently, this can lead to higher levels of success and quality while reducing potential extra costs by minimizing the number of unused developments.

This document benefited from the assistance of ChatGPT and Grammarly, which were used to refine and improve the cohesion and overall clarity of the text. Moreover,

all the interviews were transcribed using the help of the Turbo Scribe Transcription Software.

2. LITERATURE REVIEW

To understand the concept of BPS, it is essential to first grasp the underlying concepts and its origins. Davenport defines a business process as "a set of logically related tasks performed to achieve a defined business outcome" (Davenport & Short, 1990, p.4). In simpler terms, a business process consists of interconnected activities that work together to achieve a specific result. These activities are linked by clear inputs, outputs, and performance metrics. A company can effectively and efficiently meet its business objectives only if its people and other enterprise resources, such as information systems, collaborate seamlessly to support these processes (Weske, 2019).

Moreover, to standardize business processes, a standard must be in place. According to the International Standardization Organization (ISO), "Standards are documents, established by consensus and approved by a recognized body, that provide, for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at achieving the optimum degree of order in a given context" (ISO, 1996). In the context of processes, the standard refers to the master process, which serves as a reference for all others and is typically designed to be as efficient as possible.

BPS revolves around both concepts. The primary goal of BPS is to make process activities transparent and achieve uniformity across the value chain and firm boundaries (Wüllenweber et al., 2008), which ultimately enhances organizational efficiency. Numerous articles, books, and scientific publications highlight the importance of process standardization and its various benefits. BPS is commonly applied to reduce redundancies (Tregear, 2015) and improve the quality of products and services (Mahmoodzadeh et al., 2009). Furthermore, companies are increasingly investing in the standardization of their business processes (Goel et al., 2023).

This literature review is divided into three main segments. Firstly, it focuses on understanding the current BPS scenario and the benefits BPS brings to organizations. Secondly, it presents valuable data-driven scenarios that demonstrate how unified and

standardized teams work better in agile environments. Finally, it connects the previously discussed segments and establishes a correlation between them.

2.1 Current BPS scenario

Variability in Business is inevitable. While many suggest that complete uniformity is the ultimate goal of BPS (Romero et al., 2015), it has been empirically shown that a certain variability cannot be avoided (Frei et al., 1999). Maximizing the BPS levels allows the firm to exploit economies of scale (Beimborn et al., 2009) and is recognized in the literature as a driver of performance improvements in terms of cost, time, efficiency, effectiveness, quality, and responsiveness (Romero et al., 2015).

Numerous projects benefit from BPS. Hadfield (2007) reports that a successful process standardization project resulted in savings of £600 million. Moreover, BPS is playing and will keep playing a very important leading role as a tool for companies (Tsilvik, 2022) and numerous examples demonstrates the enormous effectiveness levels of standardization, such as IBM, which reported more than 9 billion dollars worth of saving and increased levels of quality and on-time deliveries by 75% due to the standardization of processes (Hammer & Stanton, 1999). As a tool, BPS has a significant impact on enhancing project performance and productivity, ultimately leading to market success by facilitating communication between departments and providing a means to compare performance (Davenport, 2005). This also increases transparency and control. BPS aims to achieve uniformity in process activities across the value chain and firm boundaries (Wüllenweber et al., 2008). With high levels of process standardization, firms benefit from improved quality, time efficiency, and cost-effective ways of achieving business process goals (Münstermann et al., 2010).

2.1.1 Value of process standardization

The objective of applying BPS principles is to achieve a level of process standardization and make them uniform across the levels of the value chain. By correctly applying these principles within the organization, there are a series of value-added benefits for companies, particularly in terms of improved communication, enhanced

product quality, reduction of errors, and better utilization of human capital. (Wüllenweber et al., 2008).Münstermann et al.(2010) also supports this value proposition and indicates that BPS directly impacts overall process performance, improving them in terms of cost, time, and quality. Based on previous studies by Wüllenweber et al., Münstermann (2008) summarizes the potential benefits of BPS in the table below.

Table 1 - Value generated by process standardization
Source: Münstermann & Weitzel (2008)

Value driver	**Description**
Improved process performance	• Reduced end to end time • Reduced process costs • Improved process quality • Increased performance measurability
Enhanced readiness	• To outsourcing business processes • To merge with or buy other companies • To react to market and external change and trends by increased process flexibility
Enhanced ability to react to regulatory changes	Founded in the enhanced readiness to react to external changes companies having standardized processes can easily react to regulatory changes.
Enhanced technical interchangeability	Standardizing processes, firstly, step by step detaches the processes from supporting IT and thereby, secondly, enables the use of standard hard- and software solutions.
Improved customer confidence	The more standardized processes are, the lower the probability for process-driven mistakes will be. Consequently, the overall quality and thereby customer confidence improves.

2.2 Standardization in Agile Environments

As a key driver of digital transformation, BPS not only influences but also enables the digital transformation process by ensuring high-quality standards. It is also recognized as one of the enablers of digital transformation (Morakanyane et al., 2017). Unified processes are particularly beneficial in Agile environments. Methodologies such as SCRUM particularly benefit from the high levels of process standardization as they foster a culture of customer collaboration, adaptability, and responsiveness to change (Kent Beck et al., 2001; Natarajan & Pichai, 2024). Without a certain level of process

standardization, challenges such as the lack of effective collaborative tools, global task boards, suitable bug and issue trackers, and globally accessible backlog tools can block the successful SCRUM implementation (Hossain et al., 2009). To address these challenges, SCRUM incorporates specific procedures that must be followed to achieve desired results, such as daily stand-up meetings, sprint planning, and regular retrospectives.

Yahoo!, a well-known service provider, serves as a prime example of the importance of standardization for the successful implementation of SCRUM. Yahoo! Answers, a large-scale, multi-team collaborative effort spread across two continents, faced significant challenges when transitioning from the traditional waterfall methodology to SCRUM. As Drummond and Unson (2008) note, "the Answers platform had many issues as the initial code base was not built as scalable production-quality code. To continue with the success of the Answers platform, a complete rewrite was deemed necessary." (p. 318) To address these challenges, training and process standardization were conducted by the same person using the same materials, ensuring that everyone adhered to the same standards. This approach aimed to reduce miscommunication and enable better-coordinated decision-making (Drummond & Unson, 2008).

In the case of Company X, the non-unification of processes brings several problems that touch on fundamental factors for the smooth operation of the development department, especially concerning the entire requirements management, making the work difficult and non-functional. By standardizing processes, the company can ensure that teams are aligned, which will reduce the complexity of managing requirements and enhance productivity.

As a key driver of digital transformation, BPS not only influences but also enables the digital transformation process by ensuring high-quality standards. It is also recognized as one of the enablers of digital transformation (Morakanyane et al., 2017).

2.3 BPS & Agile environments

In conclusion, BPS and agile performance are correlated concepts. BPS promotes high levels of process standardization, which benefits companies by providing quality, time efficiency, and cost-effective methods for achieving their business process goals (Münstermann et al., 2010), which is also the goal of implementing agile. With high levels

of process standardization, companies can reduce miscommunication and allow for better-coordinated decisions (Drummond & Unson, 2008). In the case of company X, BPS would enable better requirement gathering and alignment within the market that will enhance productivity to the agility teams, which would improve the usage of the company resources, resulting in more productivity, enhancing quality and capacity to deliver even more innovative solutions to their clients.

2.4 Challenges and Limitations of BPS

Although BPS has been proven to bring several advantages to companies that apply its principles, it is not a perfect approach. Depending on the company's context, some limitations can be identified, as cited in the Handbook on Business Process Management (2000), several challenges for the BPS are cited, namely:

Management Structure and Responsibility: With the implementation of new processes, power and authority shift for some individuals, and roles and responsibilities are significantly altered. Functional managers often transition into process managers, and many other positions undergo substantial changes, including shifts in duties. This makes adaptation challenging, leading to various problems.

IT Support: BPS is closely tied to the implementation of enterprise resource planning (ERP) systems, enabling cross-departmental integration through unified software systems. This integration distributes responsibility for data across various roles.

Enterprise Processes: Organizations typically focus on their internal end-to-end processes, but these processes often intersect with different levels of the supply chain. In many cases, it becomes challenging to define governance and establish standard models, particularly in determining who the true process owner is to set effective standards.

Impact on flexibility: Afflerbach (2016) also discusses that altough BPS positively influences process performance, such as time, cost, and quality (Münstermann et al., 2010), it also causes extra investment needs and may reduce an organization’s ability to meet customer, which decreases organizational flexibility level.

3. METHODOLOGY

Company X, a technology-driven startup operating in multiple countries, including Brazil, Portugal, the United States, Spain (headquarters), and Mexico, exemplifies the potential of such technology in the sector by providing innovative solutions to facilitate passenger transportation between the workplace and home.

Company X has a product development team based at its headquarters, responsible for all markets. To ensure development quality and meet customer expectations, the team has adopted an agile software development approach, specifically SCRUM, which operates on a two-week sprint cycle beginning on a Tuesday and concluding on the following Monday. The Company X development team is divided into three "squads" – Namely groups composed of one product owner and two or more developers - primarily focusing on specific projects that typically are developed over two to three sprints, during which new requirements from each market and key stakeholders are implemented.

Several products have been developed through this approach, including:

Dashboard: An online platform responsible for controlling and operating most of the operations, designing and programming routes, monitoring them in real-time, and providing clients with insights using live and historical data about the services performed.

App Users: A smartphone application that generates a QR code for each passenger (user), which can be scanned by the App Drivers to access transportation services. Additionally, the app enables trip booking and provides useful information, such as real-time bus tracking.

App drivers: An application designed for drivers employed by providers (bus operators using Company X's technology) to manage services, scan tickets, and provide tracking.

Providers: An online platform that assists providers in assigning drivers and vehicles to perform each service, creating an ecosystem that manages and adapts to the specific needs of passengers and operations.

With the company's expansion in recent years, new challenges have emerged in its development practices, particularly in product requirements management. Each market presents unique needs based on the types of clients it serves. For example, the Brazilian

market primarily works with blue-collar clients, who operate in shifts and require transportation solutions tailored to their specific schedules. Although the Brazilian operation also serves white-collar workers or "office" employees, who generally work from 9 AM to 6 PM, its operations and processes have been primarily designed to meet the needs of blue-collar clients first, before addressing white-collar requirements. In contrast, the Iberian market predominantly serves white-collar workers. Due to their standard office hours, these clients benefit from multiple public transportation options that can complement the services provided by Company X, thereby enhancing the transport network. Consequently, the Iberian operations are structured to prioritize the needs of white-collar clients.

Different client profiles, cultural contexts, and types of operations have led to the development of distinct processes, work methods, and product development requests in each market. As a result, there is a lack of standardization across markets, complicating requirements management and creating additional challenges for the product development team, which must maintain a global standard product that often includes new features utilized by only a portion of the clients.

Another challenge posed by globalization at Company X is the lack of standardized system usage. Although users are restricted in certain ways to use the system in specific formats, there is a degree of flexibility that makes each operation unique, with varying levels of human intervention required. It is not uncommon for different individuals to achieve the same result using different methods, system components, and external third-party programs. Moreover, the company's significant presence in different countries has led to challenges related to team collaboration, such as language barriers, particularly evident in the Brazilian market, where English proficiency is often limited. This language barrier complicates requirements gathering, not only in problem definition but also because solutions are problem-based, and failing to gather the correct requirements may result in solutions that are not fully aligned with actual needs.

Additionally, the lack of centralization exacerbates these issues. Teams tend to support their product needs based on the system usage specific to their market, which is not uniform, leading to multiple sources of input for the product, duplication of information, and extra work.

Considering, the challenges faced by Company X and the difficulties faced from the overgoing expansion, this chapter aimed to develop a methodology to answer the proposed three key research questions: (1) What are the main benefits of BPS for organizations like Company X? (2) How can BPS improve product quality and operational efficiency? and (3) What specific advantages does BPS offer in Agile environments?

A qualitative approach was selected due to the nature of the research questions, which requires understand deeper how the standardization levels affect each process and member of the organization. This type of approach addresses the research questions concerning 'how' and 'why' and allows a researcher to understand the context, phenomena, and experiences (Cleland, 2017). In the context of the study, it's important to consider that the most important aspect is to understand in depth the company context, answering questions about the correlation between BPS, the agile environment and how they correlate with each other, which in practical terms, is not easily quantifiable and, because of that, a quantitative approach, although being a compelling approach for analyzing numerical data and making generalizations, wouldn't be able to extract the data without the necessary context, because of that, a qualitative approach is appropriate (R. Yin, 1994). It's also important to consider that each participant in the context of company X could have different perspectives on the addressed issue, and this approach provides more flexibility and tools, ideal for analyzing this type of data.

3.1 Case Study

Yin (2018), an authority on case study research defines Case Study as "being an empirical method that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be evident" (p. 16), he also complements his definition – "In a case study, there will be more variables of interest than data points, and as one result benefits from the prior development of theoretical propositions to guide design, data collection, and analysis" (p. 13). Along with this definition, Yin's framework for designing and conducting case studies serves as a foundation for this methodological approach and as an ultimate base for this case study application.

Similarly, Eisenhardt (1989) has a similar definition that states the case study is a research strategy which focuses on understanding the dynamics present within a single setting. In his book, 'Case Study Research: Design and Methods', Yin also relates not only to the definition of a common understanding of the Case study but also what covers its applicability and when it should be applied rather than another research approach (see Table 1).

Table 2 - Relevant Situations for Different Research Strategies
Source: COSMOS Corporation. (R. Yin, 1994)

Strategy	**Form of Research Question**	**Require Control of Behavioral Events?**	**Focuses on Comtemporary Events?**
Experiment	How, why?	Yes	Yes
Survey	Who, what, where, how many, how much?	No	Yes
Archival analysis	Who, what, where, how many, how much?	No	Yes/No
History	How, why?	No	No
Case study	How, why?	No	Yes

Although the questions of this study also had 'What' questions, the most important research question that guided this study was a 'How' – "2. How can BPS improve product quality and operational efficiency?" – which outlines the exploratory background of this research and the Case study implementation. In the context of Company X, it's extremely important to reach depts of the causes of the problem and how can they be resolved within the application of the BPS principles, because of that, an explanatory Case Study research strategy was used, focused on understanding the causal relationships between BPS and the overall productivity of the product department.

3.2 Data collection

To collect the necessary data to perform an extensive analysis within the previously stated research questions, semi-structured interviews were used. While semi-structured interviews lie between the structured and unstructured types (see Figure 1) provide space for the researcher to spontaneously ask questions and have more freedom to interview without a very strict agenda, which guarantees a better development of the conversational flow. (Karatsareas, 2022b).

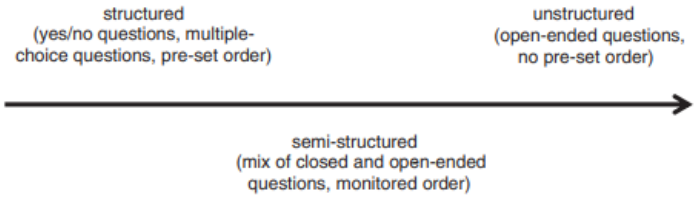

Figure 1 - Interview Structure levels

Source: Karatsareas (2022b)

Participants were selected using a purposive sampling methodology. Given the importance of understanding the impact of standardization on Agile improvement, key stakeholders related to the agile and technical fields were chosen based on both their relevant qualities and their ability to articulate expressively and reflectively (Etikan, 2016), maximizing the quality of the results. Due to time constraints and participants' availability, five employees from Company X were selected and interviewed, specifically:

Participant 1 Agile Team leader, mainly focused on APPS & Sites.

Participant 2 Agile Team leader, mainly focused on Dashboard.

Participant 3 Product Owner, mainly focused on Dashboard.

Participant 4 Product Lead.

Participant 5 Chief Technology Officer (CTO) of Company X.

Each interview was conducted online, lasting between 25 and 45 minutes. The interviews were primarily in English, except for one, made in Spanish and posteriorly translated due to a participant's language preference. All interviews were recorded via Google Meets and transcribed with the auxiliary help of the Turbo Scribe transcription Software tools. Each interview began with a structured set of six questions that addressed

the core research topics. Additionally, each question had a potential follow-up designed to provide further insight and help guide the participant's responses. The interviews were structured using the following methodology, as shown in Figure 2.

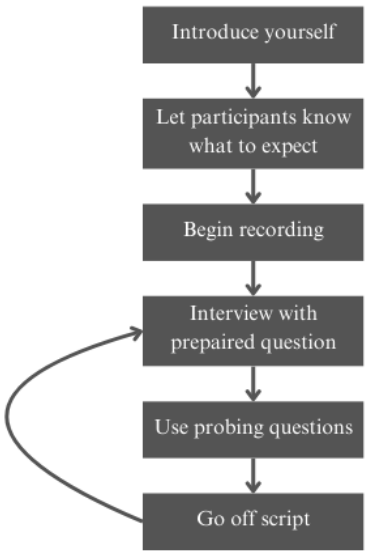

Figure 2 - Steps to Conduct Semi-structured Interviews

Source: Delve (2023)

The first two questions addressed the research question - What are the main benefits of BPS for organizations like company X? The questions were as follows:

1. Do you think that the standardization of processes of the markets can bring advantages/disadvantages to the product department?

Literature bases: Wüllenweber argues that standardization of processes reduces costs and decreases process errors, facilitates communication, and concludes a very solid relationship between business process outsourcing (BPO) and BPS techniques (Wüllenweber et al., 2008). Encouraged by that, the following question was formulated, seeking to explore the operational benefits of BPS in the Agile setup and subsequently, the cost saving with the optimization of the developments.

Follow up: Think about how the product department collected requisites before and after the Iberian unification, how do you think it affected aspects like the team workload and overall processes?

Key research question intended to be addressed: What are the main benefits of BPS for organizations like company X?

2. Consider the entire product development cycle, from when users interact with the system to when feedback is collected, and new tools are developed. How do you see BPS influencing this cycle? In your opinion, does BPS have an impact on this process, and if so, how?

Literature bases: (Romero et al., 2015) Argues that "the extent to which uniformity is achieved influences the extent to which business performance benefits associated with process standardization can be achieved" (p. 263), emphasizing that the level of uniformity directly affects the degree of benefits a company can extract from its BPS. By reducing risks related to inefficiencies and enabling smoother operations, this question aims to explore how much process standardization is needed to create a positive impact on the product development cycle.

Follow up: Can you imagine specific examples that BPS complicated or made a development easier?

Key research question intended to be addressed: What are the main benefits of BPS for organizations like company X?

The third and fourth questions were intended to address more specifically the second research question - How can BPS improve product quality and operational efficiency?

3. Standardization of processes is also perceived as a tool that directly impacts business. Have you noticed any change in product quality and operational efficiency as standardization methods are being applied?

Literature bases: In the article 'Factors that Determine the Extent of BPS and the Subsequent Effect on Business Performance', the authors had a very similar research question, namely "What is the effect of the extent of standardization on business performance?" (Romero et al., 2015). In the study, they argued not only direct effects such as time savings and cost but also cited by Björn Münstermann. (Münstermann et al., 2010), but also an impact on overall quality, efficiency, and effectiveness. Moreover, indirect effects on contractual governance were found: "Using process standards allows for a better understanding of how the business operates and can be improved" (Romero et al., 2015, p. 266), which improved operational efficiency and quality. This question addressed whether this improvement could also be seen in Company X and whether similar impacts were perceived.

Follow up: Think about very structured and standard processes according to markets, and other ones that completely differ on each market, how much easier is it to work on the standardized ones? Are these tools easier to develop and better in terms of overall structure and quality?

Key research question intended to be addressed: How can BPS improve product quality and operational efficiency?

4. How do you perceive Company X's growth in the next years? Is standardization across the markets the way to go?

Literature bases: Beimbern et al. highlight that process standardization allows the firm to exploit economies of scale and to improve in terms of cost and efficiency. Moreover, highlights consistency as a key across varying business units and claims that process standardization is an important complementary facet in the IT business and positively affects process performance, generating value. (Beimborn et al., 2009).

Follow up: Followed by the recent changes and market unification (Portugal and Spain), do you think it could be the case to unify at a certain level the other markets to create a unified ecosystem in Company X?

Key research question intended to be addressed: How can BPS improve product quality and operational efficiency?

Finally, the last two questions were intended to address the last research question - What specific advantages does BPS offer in agile settings – and how Agile could overcome difficulties by leveling uniformity and standardizing its processes to generate a better competitive advantage?

5. Does business standardization influence team performance in agile methodologies such as SCRUM?

Literature bases: (Hossain et al., 2009) Emphasizes the lack of effective collaborative tools, global task boards, and suitable bug and issue trackers as problems caused by teams across regions (not centralized). The author also emphasizes communication and the right tools as vital to the success of the operation, which can be reduced with BPS principles. (Münstermann et al., 2010; Wüllenweber et al., 2008). In the Yahoo case study, (Drummond & Unson, 2008) Provides an example of SCRUM's success, which relied on process standardization to reduce miscommunication. This research question intends to understand if in a different context (Company X) improvement can be found.

Follow up: Does Standardization help AGILE performance by improving processes and reducing complexity?

Key research question intended to be addressed: What specific advantages does BPS offer in agile settings?

6. Does market standardization cause any impact on teams' communication?

Literature bases: As (Wüllenweber et al., 2008) Concludes that communication, coordination, and consensus are positively affected by process standardization, and as AGILE methodologies, such as SCRUM, which relies on collaborative, and self-organized teams (Kadenic et al., 2023). This question seemed to understand the benefits

SCRUM can extract from BPS as if a correlation can be made to see if this relationship was affected positively by better standardization levels.

Follow up: Agile relies on collaboration and communication. Do you think BPS can foster better communication?

Key research question intended to be addressed: What specific advantages does BPS offer in agile settings?

After collecting data from the five interviews, a qualitative analysis was conducted with the assistance of MAXQDA software, which facilitated the development of a systematic coding framework to analyze and interpret the data. Finally, a critical review was performed to synthesize the findings. This process involved cross-referencing the coded themes with the research objectives to identify patterns and explore discrepancies and similarities in the insights from each interview, resulting in the findings presented in the following section.

3.3 Ethical Considerations

Participants were fully informed about the study objectives and its nature before the interview. Identifiable personal or organizational information was removed to guarantee confidentiality and anonymity, and the participants were informed about their right to withdraw from the study at any time.

3.4 Limitations

Several limitations could be found in the applied methodology that played a major role during the sessions, which were also described by Karatsareas. Firstly, the relationship between the interview and the participants, previous knowledge, and area of act played a major role and molded the answers of the participants (Karatsareas, 2022b). Also depending on these dynamics, participants may say what they believe the interviewer wants to hear (social desirability bias) regardless of what they truly believe (Karatsareas, 2022). (Karatsareas, 2022a) also states Codó (2008) and points out, ‘values, attitudes, beliefs, and motivations tend to be difficult to verbalize’.

4. RESULTS

Using MAXQDA, a qualitative data analysis software, to conduct a qualitative analysis on the results obtained after transcribing the interviews, coding was performed to identify the main themes and relevant topics for analysis. This coding resulted in 6 different main code categories, namely: Future Growth and Scalability; Communication; Agile Methodology; Impact on Product Quality; Operational Efficiency; and BPS. Additionally, and are summarized in the image below:

Code System	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5
Future growth and scalability	4	3	2	1	2
Communication	6	2	3	3	3
Agile Methodology		2	2	1	1
Impact on Product Quality	2	3	5	1	5
Operational Efficiency	9	2	2	5	
Business Process Standardization	21	17	9	11	20

Figure 3 - MAXQDA programmed codes
Source: MAXQDA

4.1 Business Process Standardization

During the interviews, it was generally noted that there is a very clear tendency to view process standardization as something positive. Statements like ‘if we apply the standards, it's going to be a really, really big improvement for the company’ (Interview 1, Pos. 53) or ‘The more standard, the better’ (Interview 2, Pos. 65), along with variations of these, were common and repeated throughout the different questions asked during the interview. It was also noticeable that participants who work directly with the development teams, particularly Participant 1 and Participant 2, showed a greater positive tendency towards the application of standardization methods, as when they stated, 'Standardization is the foundation for everything' (Interview 1, Pos. 109) and 'If we standardize criteria, ways of working, and everything, in the end, it is much easier to work together' (Interview 2, Pos. 25), which positively agreed with Münstermann statements ‘BPS brings high levels of process standardization, benefiting companies with quality, time, and cost-optimal ways of achieving the business process’s goal (2010).

In general, the interviewees corroborated three main positive aspects of standardization, namely: 1. BPS reduces problem complexity: By working with

standardized procedures, the interviewees mentioned that usually complex problems tend to have easier solutions, as, for example, when Participant 2 states, 'If we standardize criteria, ways of working, and everything, in the end, it is much easier' to work together (Interview 2, Pos. 25), statement that comprovates that BPS can be used to avoid (Tregear, 2015) and improve the quality of products and services (Mahmoodzadeh et al., 2009); 2. It facilitates feature development: Particularly by applying examples of developments they had already made at Company X, participant 2 mentioned, 'So, if we have everything more standardized and everyone works the same or practically the same, it is always much better for us to develop things and improve them' (Interview 2, Pos. 13); and 3. It's easier to transfer information: This last topic, among the already cited advantages, was the most commented on, mainly by the CTO of Company X, who stressed the overall importance of BPS in centralizing information and resources to keep the knowledge within the company rather than in the hands of employees who might leave and take their expertise with them. 'The mission is to create procedures and all of that in order that the company doesn't need me anymore. It's like if you put another CTO, another people there, the company will continue with any problems" (Interview 5, Pos. 31) and "I think that what it is to standardize everything is much better because in the end you have something easier to say I have this way of working or this way of everything and I work based on that" (Interview 2, Pos. 13).

On the other hand, among all participants, the disadvantages of non-standardization environments were also crucial problems that were dresses as the main points to adopt more centralized environments, mainly focused in the problems environments without BPS could have 'if you develop a function for one person, but it's not useful for another person, that won't make any sense' (Interview 1, Pos. 17), 'imagine that every employee of a Company X, is creating a route in a different way? And they are using one thing, and another employee uses one thing, for us, it's impossible to make a product' (Interview 3, Pos. 21) and in Participant 4 statement 'you cannot do anything if you don't have processes' (Interview 4, Pos. 9). Multiple input channels were also highlighted as a crucial problem that although could work in a very initial phase of the start-up, it tend to be more problematic with the more growth the company has as stated for example by participant 4 'imagine that [Employee A] is asking a thing in one channel, asking you a test in another one, and it's going to be a mess, you don't have two clients at the beginning, you know, it

was okay when our volume and company size was small, but right now, it's really difficult to maintain' (Interview 4, Pos. 41).

Moreover, the importance of flexibility was also very cited as critical to help company growth 'For me, that is one of the main things. And I think it's very important. You have many standards in the market, and you need to adapt the standards and the procedures in the markets, because not all the standards and procedures that you will see in the market are good' (Interview 5, Pos. 6). A consent among all participants was built that flexibility is important and as a key for a good product development, the product would have to maintain a certain "core" of procedures standardized with other parts being able to have flexibility to change among markets 'Flexibility to adapt very fast to another way of working, but you need to find the equilibrium […] Flexibility, but with some procedures' (Interview 5, Pos. 10). This concept matches exactly the same concept cited by Frei that states that a certain variability cannot be avoided (1999) and positively agrees that certain variability is necessary on any environment.

4.2 Operational efficiency

In terms of operational efficiency, the interviewees primarily converged on two main topics, namely improved processes through BPS and challenges with multiple markets. Regarding the first one, participants highlighted overall enhancements: "Yeah, it's easier if you have standards" (Interview 1, Pos. 33), and easier problem-solving due to the increased number of standards and documents that strongly supported the overall processes at Company X: "If you have a checklist, I need to create a rate, well, I go to Confluence, look for the document about rates. Okay, these are the steps to create rates. If all the countries use the same steps, if something weird happens, okay, something weird is really happening" (Interview 1, Pos. 49), and "It should be easier because if I receive a ticket saying the logins are not working, for example, for me it's like, okay, everyone uses the login the same way. For that reason, we have two error options, like, it's either this one or that one, and it should be easier if you have a structure in the background" (Interview 1, Pos. 85). These statements also show a greater ease in understanding when problems are caused by improper use of company products or due to any failures in the development process. Standardized procedures were more easily corrected, leading to

better and more efficient development, as also noted by Participant 2: "So, if we have everything more standardized and everyone works the same or practically the same, it is always much better for us to develop things and improve them" (Interview 2, Pos. 13).

On the other hand, Challenges with multiple markets were also stated. The interviewees stated difficulties to catch-up the markets problems with non-standardized processes ‘we are not understanding exactly everything that we are saying, as they are not talking and showing us examples, it's more difficult. We are always trying to understand what they are saying and not seeing it, like, okay, can you show me a client, can you show me? So, sometimes this is more difficult’ (Interview 4, Pos. 17). Moreover, due to the non-centralization of processes and the team disposition among countries, namely of the product team fully incorporated in the HQ in Barcelona, problems to understand market needs were also found more in other countries ‘If you talk about how, you feel about centralized product, right now it's centralized in Barcelona, okay. And I think it has a strong point, like, for example, we are all together, we understand the same things, we are doing the things the same, but the other part is like, as our clients in the market, sometimes we don't feel their pain’ (Interview 4, Pos. 13). This exacerbates a cultural factor that directly impacted on productivity and development of new features among countries, as participant 1 also stated ‘It's easier because it's like different points here. You have a similar way to work because it's a culture thing, too and that's important. Every market is different for the culture, too. That's a difference and it's easier, but it's easier because you have a similar way to work’ (Interview 1, Pos. 45).

Both concepts directly relates to Romero ideas (2015) when arguing that “the extent to which uniformity is achieved influences the extent to which business performance benefits associated with process standardization can be achieved”, as typically markets without standardized processes tend to extract less benefits from BPS and implies that if markets starts to standardizes more their overall processes, it could significantly improve the efficiency and effectiveness of its products, leading to faster and more reliable outcomes. With high levels of process standardization, markets could also reduce miscommunication and allow for better-coordinated decisions, as stated by Drummond & Unson (2008).

4.3 Impact on product quality

Among the participants, a general consensus emerged that BPS could positively impact product quality. This understanding is reflected in several statements, such as: "We need processes, and I think that it will help us to improve our quality" (Interview 4, Pos. 45), and from Participant 5: "If you have fewer procedures, fewer standards, you will have less quality. If you have more standards, more defined procedures, you will definitely have more quality" (Interview 5, Pos. 23). The impact on quality as defined by the participants can be summarized in the diagram below.

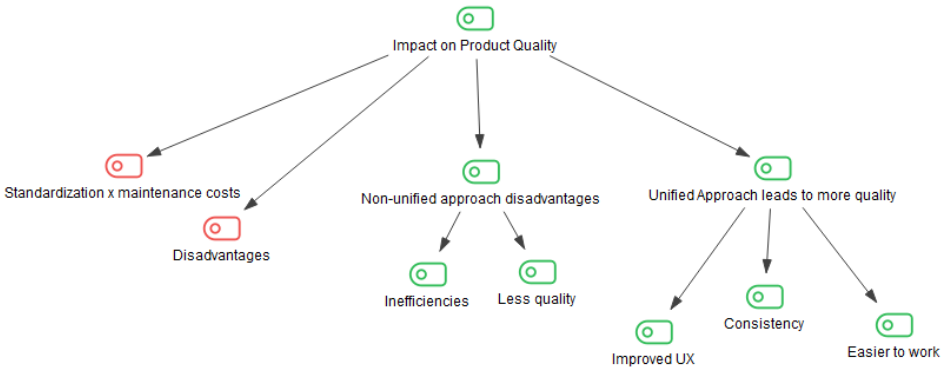

Figure 4 - Product quality codes
Source: MAXQDA

The Company X CTO states a general increase to the time needed in developments when standardization is applied: ‘for sure. It's like when you start to create these procedures, maybe you take more time’ (Interview 5, Pos. 23). Moreover, he proposes a trade off against maintenance costs ‘if you have a bad definition, a bad structure, a bad procedure, you will spend less time in the development, but you will spend a lot of time in maintenance and that is the gap that we have in our company that right now, we are trying to reduce’ (Interview 5, Pos. 23) and ‘two years ago, we spent a lot less time in the definition, to develop, put in production, but we spent a lot of time in maintenance’ (Interview 5, Pos. 23).

When questioned regarding the impact on product quality, the other participants were tendentially positives, as stated for example by participants 4 ‘We need processes, and I think that it will help us to improve our quality’ (Interview 4, Pos. 45) and 5 ‘If you have more standards, you have more procedures, more defined things, and you will have more quality’ (Interview 5, Pos. 23). As main improvements participants cited Improved user

experience (UX) ‘it's easier for us to understand how our team are using this, because they are using this in one way, so we can sit with them and understand, and it's much more easy for us to understand them and to improve UX and to have, as you say, a good quality product’ (Interview 3, Pos. 61), consistency, as described for example by participant 1 ‘It should be more easy because if I receive a ticket, the logins are not working, for example, and for me it's like, okay, everyone uses the login in the same way. For that reason, we have two error options, like, or this one or this one, and it should be easier if you have a structure in the background’ (Interview 1, Pos. 85) and an easier to work environment ‘if everybody use the tool in the same way, for us, it's easier to improve the product’ (Interview 3, Pos. 21). Moreover, the participants also pointed inefficiencies and less quality coming together with less BPS. ‘if you don't have a standardization process, you cannot organize the team, and organize the product, and organize the things that we should do and this is, it can become a mess’s (Interview 3, Pos. 57).

In conclusion, it can be said that the responses converge with Münstermann's conclusions. Although not supported in terms of cost benefits - likely because the participants have no direct involvement with financial areas - there are noticeable direct impacts on the efficiency and effectiveness of operations. This aligns with Romero’s theories, which state, “Using process standards allows for a better understanding of how the business operates and can be improved (2015).

4.4 Future Growth and Scalability

When asked about the company's future growth and scalability, participants generally provided positive responses regarding BPS. The CTO, for instance, highlighted that changes in the company often depend on human factors: "For sure, it's a reality right now and we are working on that. The only difficulty, like, and it's normal also that difficult, you know, doing this, you will see that all the company will change […] I also believe that you have people for all the steps of the company and some of them will be very good for some phase. And in the other phase, these people will go and leave the company because they don't work well in this kind of phase" (Interview 5, Pos. 31). Other participants, however, expressed more optimism about the model, suggesting a core of standardized processes with levels of flexibility: "We can't say a standard for everyone,

but that's why we need a standard with a little flexibility based on the needs of each market and I think that would be a bit of the future that we can have" (Interview 2, Pos. 77).

Overall, process standardization is seen as necessary for Company X, especially as the company continues to grow and consolidate: "Company X is getting bigger and bigger and bigger each time, it will be more difficult and more difficult if we don't standardize processes" (Interview 3, Pos. 65). Overall, the collected data complements Beimborn's ideas. While process standardization does allow for the exploration of economies of scale and the improvement of efficiency (Beimborn et al., 2009), it is also necessary to maintain, a certain level of flexibility to ensure that operations can adapt to different market needs as described by Frei (1999).

4.5 Agile Methodology

The conducted interviews align with the literature base. Hossain (2009) emphasizes the lack of effective collaborative tools, global task boards, and suitable bug and issue trackers as problems caused by teams spread across different regions (non-centralized), which was corroborated throughout the interviews. The interviewees mainly pointed out the lack of unified documentation and working environments as key areas for improvement with the application of BPS principles. This is exemplified by Participant 4: ‘Right now, we have a client, and we are developing a specific, not tool, but app for them, and I think we are facing a lack of processes. For example, for me, it would be super important when a new client development arrives, we have a super clear operational, I don't know if it's a document, like, okay, this is going to be circular routes with cross-selling, and they are going to need more than one ticket for going, one more ticket for returning, and this part can be done with the system, and this part cannot be done, so we have to think of a solution. And if everyone bringing a new client does this, and it takes like 20 minutes to do this document, I think we can improve or reduce a lot of time’ (Interview 4, Pos. 21).

Additionally, the application of BPS principles substantially improves the product: ‘if everybody uses the tool in the same way, for us, it's easier to improve the product’ (Interview 3, Pos. 21). It proves to be essential, particularly in how teams interact with

requirements. One of the main points raised during the interviews was the use of JIRA - a software created by Atlassian that manages the product backlog and serves as a unified portal for requesting new developments. The goal was to centralize all requirements management in one place and prevent information from flowing through secondary channels, potentially getting lost in the process: 'It's easier because we have the proper channels to do it, now, we have the Google chat, we have the Jira, […] we have the standardization of communication' (Interview 1, Pos. 93).

However, among the participants, the company's CTO demonstrated a more conservative stance, mentioning that in Agile environments, one must be cautious not to let procedures slow down development: 'when you escalate, when you have a huge team, you put more procedures, more restriction, the Agile is getting not agile, it's getting slow' (Interview 5, Pos. 37). Compared to the Yahoo! case, Company X seems to be on a similar path. By applying BPS principles - especially those that promote the use of a unified environment and general usage procedures - it will reduce miscommunication and allow for better-coordinated decisions, as described by Drummond & Unson (2008).

4.6 Communication

During the interviews, the theme of communication emerged mainly as a secondary topic, particularly when discussing the structuring of processes with BPS. In general, participants tend to weigh collaboration factors based on the current communication channels of Company X. Furthermore, some participants, having worked at the company for several years, have a more enhanced perspective, comparing what the company was like years ago to its current state and communication vehicles. Overall, the standardization of communication was seen as essential for process improvement: 'Comparing to the last year, one year ago, we didn't have the communication like we have right now. Now it's more controlled, this is the channel, and everyone is trying to do their best to tell you and reply to you in the correct place' (Interview 1, Pos. 97) and 'but for now, we are educating people to go to Jira and create a ticket' (Interview 1, Pos. 70). At the same time, there is concern about market needs, as each one tends to require different methods and communication vehicles: 'but you have this asynchronous communication, you create many channels, but it's difficult to adapt the channels to all the people, because

some of the people will read the email, some others need a demo, some others need the demo with the documentation, because they don't understand' (Interview 5, Pos. 42). However, generally, participants again return to the topic of flexibility, as previously described, working with a "centralized core" with differences depending on the market, as long as it doesn't change the overall concept: 'after that, maybe someone needs extra information and texting you in the chat is a plus, but we have the right way to do it, we have the ticket, and we have the standardization to the communication' (Interview 1, Pos. 93).

Additionally, communication was described as one of the main problems to be addressed by Company X, which has been implementing processes and standardizations for centralization: 'With Iberia, it's different because you have a process; for example, when it's Mexico, we receive, all of us, we receive WhatsApp messages, someone sends an email, someone calls the CTO, but no one creates a ticket. It's like, please, follow the process' (Interview 1, Pos. 66) and 'So, to have a glossary process that is clear for everyone, it will be magnificent for me; that's the first one' (Interview 4, Pos. 9).

Undeniably, Company X is aligned with Wüllenweber's statements, and the communication topic is positively affected by BPS principles. To support this, they base their transition on usable materials and standards that must be followed to reduce miscommunication, which also aligns with the statements of Drummond & Unson (2008).

4.7 Final Thoughts

In conclusion, the interviews revealed a strong relationship between BPS and nearly universal improvements among the development, IT, and product departments regarding efficiency, flexibility, organization, and communication. The participants, despite coming from different departments and varying levels of expertise within the company, positively converged in their responses regarding the adoption of BPS principles as an essential tool for future organizational growth, which is undeniably necessary to meet upcoming levels of organizational demand.

While BPS principles are accepted as advantageous for improving the quality of products and processes at Company X, there is also a concern regarding the necessary

levels of flexibility within the company, especially to continue meeting the diverse requirements of the markets in which it operates. In this regard, the interviewees converge on the idea of adopting a blend of mandatory standardization levels and some flexibility.

5. CONCLUSION

This research aimed to understand how the unification of processes enhanced agile development and requirement management through a case study conducted at Company X, a growing startup that is expanding into various markets and facing challenges due to a lack of standardization. Based on a qualitative analysis conducted through semi-structured interviews with Company X employees, we can answer the research questions.

Various authors have already highlighted the benefits of BPS to companies, such as increased transparency and control, cost, quality, and time optimization, improved process performance, enhanced readiness, better ability to react to regulatory changes, improved technical interchangeability, and greater customer confidence (Münstermann et al., 2010; Münstermann & Weitzel, 2008; Wüllenweber et al., 2008). With high levels of process standardization, firms benefit from improved quality, time efficiency, and cost-effective methods for achieving business process goals (Münstermann et al., 2010). In the interviews conducted in the context of Company X, the results support and align with the literature. Overall, BPS is seen as a process enhancer. Participants corroborate this view, citing advantages such as simpler information transfer, streamlined product development, and reduced work complexity. Additionally, BPS directly impacts the final product developed by the team, bringing consistency, improving UX, reducing inefficiencies, and promoting quality.

Overall, BPS does indeed improve product quality and operational efficiency. This is evident from the responses of the interviewees at Company X. Supported by the application of these principles in the Iberian market and the company's ongoing growth, they demonstrated a positive understanding of the standardization of processes, particularly through documented support and the use of integrated systems, such as JIRA. Responses like "It’s easier with standardization" were common and supported this idea. Additionally, the interviewees also shared examples from their own experiences and perspectives, stating that, in general, the tools that were easiest to identify, act upon, and

resolve problems, as well as implement new solutions, were those with higher levels of standardization.

In agile environments, which suffer from a lack of standardization and are the main source of challenges for Company X, the adoption of BPS principles makes the work simpler, provided it is properly supported by software capable of meeting the needs and that processes are adequately documented, allowing standardization to be passed on at all organizational levels. In general, tools with standardized usage tend to be easier to work with, as there are fewer "branches" and less need for customization, reducing the amount of necessary work and, consequently, the margin for error. Moreover, the adoption of BPS principles substantially improves team communication, as working with fewer channels and in a more organized manner allows for better information flow and more controlled developments.

However, it is important to note that although the participants were positive about the implementation of BPS principles, they expressed concerns regarding the adoption of these principles across the entire company at all levels, emphasizing that a certain level of flexibility is necessary to ensure that the company can meet the different demands of multiple markets. Furthermore, flexibility was often cited as a tool that supports agility in certain cases, and an excessive number of processes could lead to a slower environment if applied without real need. Overall, the participants suggested that the ideal way of working is by creating a "core" of centralized processes that function for the entire company, with small levels of flexibility emerging to respond to specific market segments.

In general, the adoption of BPS principles is seen as positive, and through both the interviews and the literature review, participants confirmed that the company's growth would be conditioned by process standardization. While the absence of such processes may have been functional during the company's earlier, more embryonic stages, as the company grows, processes become increasingly necessary to improve product quality, processes, and future developments. Therefore, standardization becomes essential for Company X.

5.1. Limitations and Future Work

This study has several limitations that need to be acknowledged. Firstly, the relationship between the interview and the participants, previous knowledge, and area of act played a major role and molded the answers of the participants (Karatsareas, 2022b). Also depending on these dynamics, participants may say what they believe the interviewer wants to hear (social desirability bias) regardless of what they truly believe (Karatsareas, 2022). (Karatsareas, 2022a) also states Codó (2008) and points out, ‘values, attitudes, beliefs, and motivations tend to be difficult to verbalize’.

Second, the research was conducted solely within the context of Company X, which, while providing a more objective and specific description applicable to this company, lacks generalizability. Additionally, due to the participants' schedules, the interviews had to be conducted within a reduced timeframe. For the same reason, part of the team could not be interviewed, resulting in a less favourable overview even within the context of the company.

Third, the study was executed in a less favourable temporal context. BPS processes tend to be applied gradually, and since Company X is in the early stages of implementing BPS, a before-and-after comparison cannot be made.

Fourth, the current literature provides little data applied to the organizational context of startups, which is a factor that limits comparisons with principles already adopted by other companies.

Also, the methodology applied is subjective, which may lead to potential biases. Participants' responses may be influenced by personal perspectives and may not represent the company as a whole. Additionally, the collected sample may not capture the full range of opinions within the company.

As future work, a more in-depth study over a longer time horizon applied to Company X would be necessary. Furthermore, conducting a study with a larger sample size would be ideal for generalizing the findings, especially across different departments to enable cross-departmental comparisons.

Additionally, a longitudinal study is needed to frame companies in contexts similar to Company X, which would provide greater context and allow for comparisons.

Finally, a post-implementation study of the principles in an organizational setting is necessary to better understand the impacts of the implementation, particularly regarding the level of adoption of the principles and organizational benefits.

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