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Original Article

Application of the scrum framework to improve the processing of extension projects in a federal institution of higher education: an analysis in light of process management

Aplicação do *framework scrum* na melhoria da tramitação de projetos de extensão em uma instituição federal de ensino superior: uma análise à luz da gestão por processos

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ABSTRACT

Purpose: This study aimed to analyze the application of the Scrum framework as a tool to improve the management of extension projects focused on service provision in a Brazilian federal institution of higher education, by integrating agile methods with business process management.
Design/methodology/approach: This study employed a qualitative approach with quantitative support using action research as the methodological strategy. The project process was mapped and redesigned using Business Process Model and Notation (BPMN), followed by the adapted implementation of the Scrum framework in selected projects. Performance indicators were collected to compare results before and after the intervention.
Findings: There was a 61.22% reduction in the average project processing time and a 71.42% reduction in the average number of review requests, demonstrating significant gains in efficiency, predictability, and procedural compliance. Hence, BPM and Scrum integration proved effective in improving administrative workflows.
Research limitations/implications: The study was limited to a small number of projects within a single institution, which restricts the generalizability of the findings.
Practical implications: Our findings provide practical insights for public and university managers interested in adopting agile methods adapted to administrative and academic project management.
Originality/value: This study provides empirical evidence for the integrated application of BPM and Scrum in the context of university extension activities, a setting that remains underexplored in public administration research.

Keywords: Project management; Agile methods; Scrum; Business process management; University extension

RESUMO

Propósito: Analisar a aplicação do framework Scrum como instrumento de melhoria da gestão de projetos de extensão do tipo prestação de serviços em uma Instituição Federal de Ensino Superior (IFES), articulando práticas de metodologias ágeis com a gestão por processos.
Design/metodologia/abordagem: O estudo adotou uma abordagem qualitativa com suporte quantitativo, utilizando a pesquisa-ação como estratégia metodológica. O processo de tramitação dos projetos foi mapeado e redesenhado por meio da notação BPMN, seguido da aplicação adaptada do framework Scrum em projetos selecionados. Indicadores de desempenho foram utilizados para comparar os resultados antes e depois da intervenção.
Conclusões: Os resultados indicam redução de 61,22% no tempo médio de tramitação dos projetos e diminuição de 71,42% no número médio de diligências, evidenciando ganhos significativos de eficiência, previsibilidade e conformidade processual. A integração entre BPM e Scrum mostrou-se eficaz para a racionalização dos fluxos administrativos analisados.
Limitações/implicações de pesquisa: A pesquisa concentrou-se em um número restrito de projetos e em uma única instituição, o que limita a generalização dos resultados.
Implicações práticas: O estudo oferece subsídios para gestores públicos e universitários interessados na adoção de metodologias ágeis adaptadas à gestão administrativa e acadêmica.
Originalidade/valor: O artigo contribui ao apresentar evidências empíricas sobre a aplicação integrada de BPM e Scrum no contexto da extensão universitária, ainda pouco explorado na literatura de Administração Pública.

Palavras-chave: Gestão de projetos; Metodologias ágeis; Scrum; Gestão por processos; Extensão universitária

1 INTRODUCTION

Public organizations are under increasing pressure to improve their management models to achieve greater efficiency, transparency, and service quality (Pollitt & Bouckaert, 2011). In federal institutions of higher education (IFES), these challenges are particularly evident in the management of university extension projects, which play a strategic role in linking universities to society and frequently face bureaucratic constraints, rework, and lengthy approval processes (Osborne, 2010). These challenges also reflect broader transformations in higher education governance, wherein institutions must balance increasing demands for efficiency, accountability, and innovation within traditionally bureaucratic structures (de Boer et al., 2020).

The literature on public administration highlights that highly bureaucratic organizational structures and excessively formalized processes tend to undermine

the responsiveness of public institutions, especially in environments characterized by multiple stakeholders, high complexity, and growing demands for innovation (Bresser-Pereira, 1998; Pollitt & Bouckaert, 2011). In this context, project management has emerged as a relevant tool for managing deadlines, resources, and organizational outcomes (Kerzner, 2011; Project Management Institute, 2017). However, traditional project management models, which rely on extensive upfront planning and sequential control, present significant limitations in environments marked by uncertainty and frequent change, such as higher education institutions (HEIs) (Shenhar et al., 2001).

As an alternative to these limitations, agile project management methods have been increasingly explored in various organizational contexts, including the public sector. Originating in software development, agile methods emphasize flexibility, collaboration, incremental value delivery, and continuous learning (Beck et al., 2001). Among these, the Scrum framework stands out for its simplicity and adaptability, grounded in the principles of transparency, inspection, and adaptation, making it particularly suitable for complex organizational environments (Schwaber & Sutherland, 2020).

Recent studies have indicated that the adoption of agile practices in the public sector can improve communication, reduce processing times, and enhance predictability of activities, provided these practices are appropriately adjusted to institutional, regulatory, and cultural constraints (Mergel, 2016; Mergel et al., 2019; Rigby et al., 2016). Nevertheless, empirical studies examining Scrum's application in administrative and academic contexts are still limited, particularly regarding the management of extension projects in IFES.

Business process management (BPM) has established itself as a relevant approach for analyzing and improving organizational processes in the public sector, supporting the identification of bottlenecks, redundancies, and opportunities for optimization (Dumas et al., 2018; Jeston & Nelis, 2014). Process modeling using Business Process Model and Notation (BPMN) contributes to workflow standardization and transparency, supports communication among stakeholders, and informs managerial

decision-making (Object Management Group, 2014). Evidence also suggests that integrating BPM with agile methods is promising, as it combines process clarity with flexibility and adaptive capacity (Trkman, 2010).

Recent studies have demonstrated growing academic interest in applying BPM in HEIs, particularly regarding process modeling, organizational analysis, and the use of BPMS tools in academic environments (Araújo & Gomes, 2022; Hoang et al., 2022). Additionally, BPM-based approaches in public academic organizations have facilitated process evaluation and performance analysis through cost and efficiency indicators (Kissa et al., 2023).

Given this context, we aimed to analyze the application of the Scrum framework to improve the approval workflow of service-oriented extension projects in an IFES by integrating agile project management practices with process modeling and redesign. Specifically, we investigated how the combination of BPM and Scrum can reduce processing time, minimize rework, and improve process efficiency without compromising institutional compliance. By adopting an action research approach with quantitative data, this study evaluated the effects of this integration using performance indicators. In doing so, it contributes to the literature by providing empirical evidence on the combined use of BPM and agile methods in public HEIs, a context where such integration remains underexplored.

2 THEORETICAL BACKGROUND

2.1 Project Management in the Public Sector

Project management is an important managerial instrument for accomplishing organizational objectives, as it enables greater control over time, resources, scope, and results (Kerzner, 2011; Project Management Institute, 2017). Nonetheless, the application of project management practices in the public sector faces specific challenges

stemming from regulatory rigidity, political interference, multiple stakeholders, and high levels of formalization in decision-making (Wirick, 2011).

Public organizations operate within environments characterized by legal constraints, accountability requirements, and limited managerial discretion, which often restrict flexibility and innovation in project execution (Pollitt & Bouckaert, 2011). Traditional project management models, which are largely based on linear planning, extensive documentation, and sequential control, tend to show limitations when applied to complex and dynamic organizational settings (Shenhar et al., 2001).

In IFES, such challenges are particularly evident. Extension projects frequently involve multiple administrative units, regulatory bodies, and external stakeholders, increasing process complexity and coordination costs. Rigid project structures may generate delays, rework, and inefficiencies, especially in settings where requirements evolve during project execution (Osborne, 2010). Consequently, there has been growing interest in more adaptive and flexible project management approaches capable of responding to uncertainty and organizational complexity.

2.2 Agile Methods and the Scrum Framework

Agile methods emerged as alternatives to traditional project management and software development models, emphasizing flexibility, collaboration, and iterative value delivery (Beck et al., 2001). The Agile Manifesto is based on principles such as responsiveness to change, customer collaboration, and continuous improvement, which contrast with rigid, plan-driven approaches. Among agile methods, Scrum stands out due to its simplicity and adaptability.

Scrum organizes work around defined roles, events, and artifacts, structured in short iterative cycles called sprints, and grounded in the pillars of transparency, inspection, and adaptation (Schwaber & Sutherland, 2020). These characteristics enable continuous feedback, early identification of issues, and incremental learning throughout the project lifecycle. Although Scrum was originally developed for software

projects, its application has expanded to non-technological contexts, including education, innovation management, and the public sector. Empirical research suggests that agile practices can enhance communication, engagement, and delivery speed in public organizations, provided they are aligned with institutional norms and governance structures (Mergel, 2016; Rigby et al., 2016).

In public sector environments, agile adoption often requires modifications to traditional Scrum practices, such as adjusting sprint duration, meeting frequency, and role assignment. Nevertheless, even partial or hybrid implementations of Scrum can yield improvements in coordination, predictability, and project performance (Mergel, 2016), thus reinforcing the relevance of investigating agile frameworks as viable alternatives for managing complex projects in IFES.

Despite potential advantages, the adoption of agile methods in the public sector has not always been successful. Rigid hierarchical structures, resistance to change, and regulatory constraints have been reported to hinder the effective implementation of agile practices (Mergel, 2016). These challenges highlight the importance of adapting agile frameworks to institutional contexts and integrating them with structured management approaches such as BPM.

2.3 Business Process Management and Business Process Model and Notation

Business Process Management encompasses a set of methods, techniques, and tools aimed at analyzing, designing, implementing, and continuously improving organizational processes (Dumas et al., 2018). It emphasizes a process-oriented perspective, focusing on value creation, efficiency, and alignment between operational activities and strategic objectives. Recent advances (e.g., process mining) have further reinforced the importance of data-driven analysis and continuous improvement in BPM initiatives, particularly in complex organizational environments (van der Aalst, 2021).

Beyond its operational focus, BPM is understood as a holistic management discipline comprised of interrelated organizational capabilities, including strategic

alignment, governance, methods, information technology, human resources, and culture (vom Brocke & Rosemann, 2013). This broad perspective highlights that process improvement initiatives are not limited to workflow optimization and depend on organizational alignment, governance arrangements, and contextual adaptation.

From this perspective, limitations observed in traditional BPM approaches, particularly their inflexibility in dealing with dynamic and uncertain environments, may be associated with insufficient integration across these capability dimensions. This reinforces the need to complement BPM with more adaptive approaches such as agile methods.

Recent studies have explored the application of BPM in higher education, including process modeling, workflow analysis, and simulation-based approaches for administrative optimization (Hoang et al., 2022; Renna & Colonnese, 2025). BPM-oriented approaches have also been applied in public academic organizations to support process evaluation and performance analysis with a focus on costs (Kissa et al., 2023). In the public sector, BPM is widely implemented to reduce bureaucracy, improve service quality, and increase transparency and accountability (Jeston & Nelis, 2014). By explicitly mapping processes and responsibilities, BPM helps organizations in identifying bottlenecks, redundancies, and non-value-adding activities, thereby supporting evidence-based managerial interventions.

As for BPMN, it provides a standardized graphical notation designed to represent business processes in a clear, consistent manner (Object Management Group, 2014), facilitating communication among stakeholders by providing a common language for process representation. The distinction between “as-is” and “to-be” process models allows organizations to compare current practices with proposed improvements and assess the impact of redesign initiatives.

Trkman (2010) highlighted the potential of integrating BPM with agile methods, suggesting that BPM provides structural clarity while agile approaches contribute flexibility and adaptability. This integration is particularly relevant in complex organizational contexts (e.g., IFES) where formal processes must coexist with dynamic project environments.

2.4 Integrating Agile Project Management and Business Process Management in Public Organizations

Integrating agile methods and BPM is a promising approach for addressing the limitations of traditional management models in public organizations. While BPM offers a systematic, process-oriented perspective, agile frameworks such as Scrum emphasize adaptability, collaboration, and incremental improvement (Dumas et al., 2018; Trkman, 2010). In public sector settings, this integration allows organizations to maintain compliance with regulatory requirements while enhancing responsiveness and operational efficiency. By aligning process redesign with agile project management practices, organizations can improve cross-unit coordination, reduce delays, and foster a culture of continuous improvement (Mergel, 2016).

Despite its potential, there is limited empirical evidence regarding BPM and Scrum integration in HEIs. Most studies have focused on software development or private sector settings, leaving an important gap in understanding how these approaches can be adapted to administrative and academic processes in IFES. Addressing this gap, this study examined the application of Scrum, supported by BPMN-based process redesign, to enhance the management and processing of extension projects in an IFES.

Badakhshan et al. (2019) highlighted the need to make BPM approaches more flexible and responsive to organizational changes, leading to the emergence of agile BPM, which combines process management with adaptive and iterative practices. These developments suggest that traditional BPM models may be limited in highly dynamic environments, reinforcing the relevance of integrating BPM with agile methods. In higher education, researchers have also explored simulation-based BPM approaches for optimizing complex academic and administrative activities (Renna & Colonnese, 2025).

The adoption of agile practices in public organizations has revealed important limitations. Institutional rigidity, hierarchical decision-making structures, and regulatory constraints reduce the effectiveness of agile methods or require significant adaptations (Mergel et al., 2019). These findings indicate that successfully applying

agile approaches depends not only on their technical implementation, but also on alignment with organizational context.

In the proposed model, BPM was used to structure and redesign the workflow by defining process stages, responsibilities, and decision points. Scrum was then applied as a project management layer within this redesigned process, organizing activities into iterative cycles and enabling continuous monitoring and adaptation. Thus, BPM provided structural clarity, while Scrum enabled dynamic execution and coordination.

3 METHODOLOGY

3.1 Research Design

This study adopted a qualitative approach with quantitative data, utilizing an action research strategy. Applied research is appropriate when the objective is to generate knowledge aimed at solving practical problems within a specific organizational context (Thiollent, 2011). The qualitative and descriptive nature of the study enables an in-depth understanding of the processes, interactions, and organizational dynamics involved in the management of extension projects. Action research was selected because it enables researchers to intervene directly within the organizational environment while simultaneously producing scientific knowledge (Coughlan & Coghlan, 2002; Thiollent, 2011). This approach is particularly well-suited to studies focused on process improvement, as it combines diagnosis, intervention, and evaluation in iterative cycles. In this study, the researchers actively participated in redesigning the extension project processing workflow and implementing the Scrum framework, thus facilitating systematic observation of changes and outcomes.

3.2 Unit of Analysis and Research Context

This study was conducted as a single-case study embedded within a Brazilian IFES located in Minas Gerais State (southeastern Brazil). The institution was intentionally selected based on three criteria: (a) the existence of recurrent operational problems

in the process, especially delays and rework; (b) the feasibility of organizational intervention during the study; and (c) the researcher's access to documentary sources and organizational actors involved in the process.

The case focused on an academic unit with consolidated extension activities and a formalized administrative structure, where service-oriented extension projects require approval by multiple organizational instances. The unit experiences a recurring volume of extension-related administrative demands, rendering project processing a relevant managerial issue. This context was considered appropriate as it combines high procedural formalization with practical demands for greater agility and coordination, thus providing a suitable context to examine the integration of BPM and the Scrum framework. To ensure institutional confidentiality and comply with the journal's blind review requirements, the names of the institution and academic unit are omitted. However, the contextual details provided are sufficient to characterize the empirical setting and delineate the scope of the findings.

The unit of analysis was the approval workflow for service-oriented extension projects. The empirical corpus comprised documentary records, participant observation, interviews with key actors involved in the process, and performance indicators extracted from administrative records. For the documentary analysis, researchers accessed institutional records for projects processed in the previous 12 months. From this universe, two service provision projects initiated during the research period were selected for the intervention phase, and their results were compared to two similar projects processed before the proposed model's implementation. This design enabled an in-depth qualitative understanding of the processes, supported by comparative performance analysis with quantitative indicators.

3.3 Data Collection Procedures

Data collection was based on methodological triangulation, combining participant observation, semi-structured interviews, and document analysis. Participant

observation was possible because the researcher was professionally embedded in the organization during the study, enabling close monitoring of routines, interactions, and process bottlenecks. Semi-structured interviews were conducted with key actors directly involved in the process, including academic managers, administrative staff, extension coordination representatives, and project proponents. Interviewees were intentionally selected based on their experience with project processing and direct involvement in relevant activities. Documentary analysis included institutional regulations, internal procedures, and administrative records related to extension projects, allowing the identification of formal requirements and extraction of performance indicators. This combination of data sources strengthened internal validity by enabling triangulation between perceptions, formal rules, and observed process outcomes.

3.4 Research Procedures

The research was conducted in four main stages, following the action research cycle. In the first stage, a diagnostic analysis of the existing process was carried out. Data collection involved document analysis, examination of institutional regulations, and analysis of administrative records concerning extension projects. Meetings with key stakeholders were held to understand activities, responsibilities, decision points, and recurring issues. Based on this information, the current process ("as-is") was modeled using BPMN, enabling visualization of the workflow and the identification of bottlenecks, redundancies, and critical points (Object Management Group, 2014).

In the second stage, the process was redesigned ("to-be") based on BPM principles and diagnostic findings. Redesign aimed to simplify the workflow, eliminate non-value-added activities, reduce intermediate decision points, and improve coordination among stakeholders, while maintaining compliance with institutional and legal requirements. The BPMN models served as a basis for defining clearer responsibilities and standardizing information required from project proponents (Dumas et al., 2018; Jeston & Nelis, 2014).

The third stage involved implementing the Scrum framework, adapted to the public and academic context of the IFES. Scrum roles, events, and artifacts were defined in accordance with organizational constraints, such as hierarchical structures and limited participant availability. The intervention projects were managed using iterative cycles (sprints), relying on product and sprint backlogs to organize and prioritize activities. Periodic meetings were held to monitor progress, identify impediments, and promote continuous adjustment, aligned with the principles of transparency, inspection, and adaptation (Schwaber & Sutherland, 2020).

In the fourth stage, the results of the intervention were evaluated by comparing performance indicators before and after the implementation of the redesigned process and Scrum-based management model.

3.5 Performance Indicators and Data Analysis

To assess the intervention's effectiveness, three key performance indicators were defined and calculated based on administrative records and institutional documents.

The duration performance index was used to measure process efficiency in terms of time. This indicator reflects the average number of days from project submission to the departmental board until final approval forwarding. The duration performance index was calculated as the arithmetic mean of total processing time for all projects analyzed in each period.

The diligence index per project assessed the conformity of submitted projects with institutional requirements. This indicator corresponds to the average number of revision requests issued per project throughout the process. It was calculated as the ratio of total diligences recorded to the number of projects analyzed in each period. A lower diligence index per project indicates greater compliance and fewer rework cycles.

The project effectiveness index was adopted as a composite indicator, integrating the duration and diligence indicator results. It provided an aggregate assessment of process performance, reflecting improvements in both efficiency and conformity

following the intervention. Comparing project effectiveness index values before and after implementation allowed for an overall evaluation of the impact resulting from integrating BPM and Scrum practices.

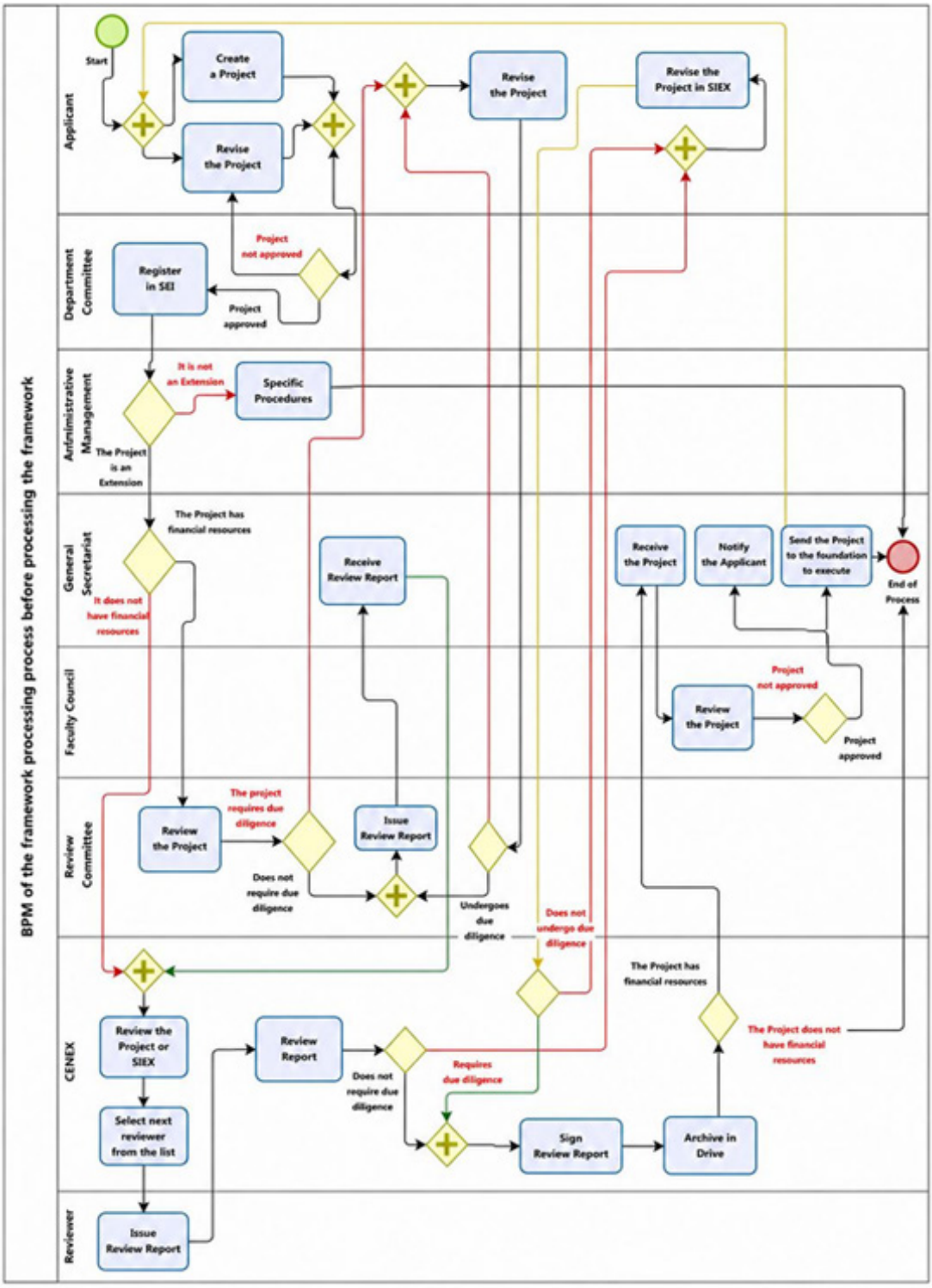
Data analysis was conducted by comparing indicator values observed before the intervention with those obtained after implementing the redesigned process and Scrum framework. This comparative analysis facilitated the identification of performance improvements attributable to the intervention, supporting an empirical assessment of its efficacy.

4 RESULTS AND DISCUSSION

4.1 Diagnosis of the Extension Project Processing Workflow (As-Is Situation)

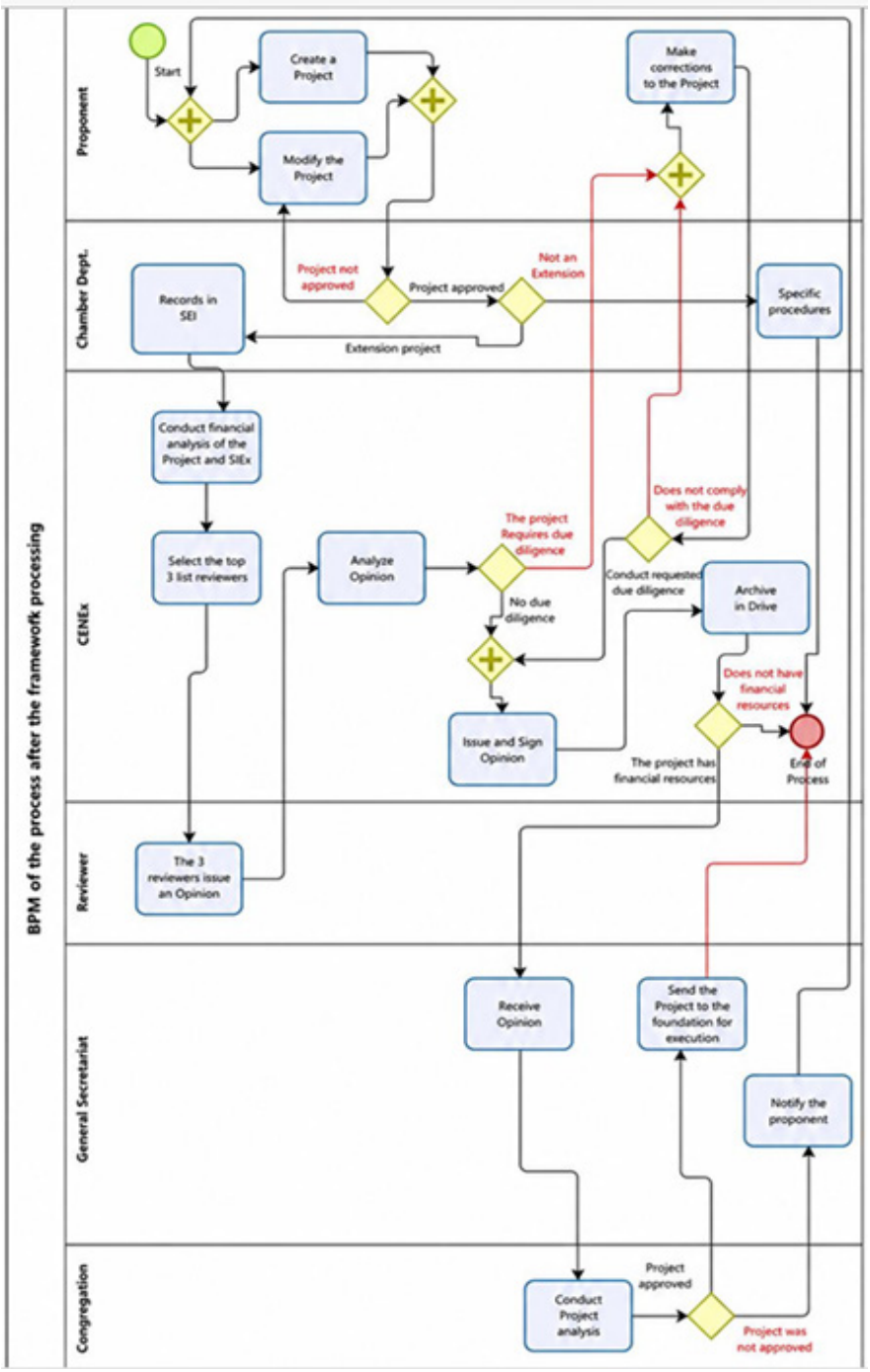
The diagnostic phase revealed that the process was characterized by excessive fragmentation, a high number of formal approval stages, and limited coordination among organizational units. The BPMN modeling of the as-is process highlighted multiple sequential decision points, redundant document checks, and recurrent requests for corrections. Together, these factors contributed to extended processing times and increased rework. Figure 1 presents the BPMN model of the current process (as-is), highlighting the sequence of activities, decision points, and main bottlenecks identified during the diagnostic phase. Administrative records indicated that, prior to the intervention, the average duration of the process was 24.5 days, measured from submission to the departmental board to forwarding for final approval. Additionally, the average number of diligences per project was 3.5, reflecting the low conformity of submitted proposals with institutional requirements and insufficient guidance during the preparation phase. These findings are consistent with studies that identified bureaucratic rigidity and process fragmentation as major sources of inefficiency in public organizations (Dumas et al., 2018; Pollitt & Bouckaert, 2011). In the context of IFES, such inefficiencies directly affect the responsiveness of extension activities and the institution's capacity to meet societal demands.

Figure 1 – As-is model of the extension project processing workflow.



Source: Prepared by the authors.

Figure 2 – To-be model of the extension project processing workflow after BPM redesign.



4.2 Process Redesign and Implementation of the To-Be Model

Based on the diagnostic analysis, the process was redesigned to simplify workflows, eliminate non-value-adding activities, and clarify responsibilities. The

to-be BPMN model reduced the number of intermediate approval stages and incorporated standardized information requirements, enabling earlier identification of inconsistencies in project proposals. Figure 2 illustrates the redesigned (to-be) process, emphasizing the structural changes implemented, reduction of intermediate approval stages, and reallocation of responsibilities throughout the workflow. A key modification was the reorganization of technical analysis activities within the extension coordination unit, which reduced dependency on multiple committees and minimized idle time between process stages. This redesign aligns with BPM principles that emphasize process simplification and end-to-end responsibility as mechanisms for performance improvement (Dumas et al., 2018; Jeston & Nelis, 2014). The redesigned process served as a structural foundation for implementing the Scrum framework, allowing agile practices to be embedded within a formally defined and institutionally compliant process.

4.3 Application of the Scrum Framework in Extension Project Management

The Scrum framework was applied to two extension projects selected for the intervention phase. Due to the public and academic context, adaptations were made to traditional Scrum practices, including adjustments in sprint duration, meeting frequency, and role allocation. Despite these adaptations, the core Scrum principles of transparency, inspection, and adaptation were maintained (Schwaber & Sutherland, 2020). The use of product backlogs and sprint backlogs improved task prioritization and visibility, while periodic meetings facilitated communication among stakeholders and early identification of impediments. These practices contributed to greater coordination and reduced uncertainty during project execution. Consistent with prior research on agile adoption in public organizations, our findings suggested that even partial implementations of Scrum can produce meaningful improvements when aligned with institutional constraints and governance structures (Mergel, 2016; Rigby et al., 2016).

4.4 Performance Indicators Analysis

Intervention effectiveness was assessed through comparative analysis of performance indicators before and after implementation. Figure 3 compares the main performance indicators observed before and after implementing the redesigned process and Scrum framework, highlighting improvements in processing time and reductions in the number of diligences per project.

Figure 3 – Comparison of performance indicators before and after the intervention (2021-2022).

INDICATORS: Projects Submitted in 2021

Item	CENEx Entry Date (SEI)	Department	Extension Activity	Modality/Classification	Department Board Approval Date	Faculty Council Approval Date	Project Start Date	Project End Date	Days to Approval	Project Value	SIEX Status	CENEx Revisions	CAP Revisions	Funding Source
1	X	DCCV – Department of Veterinary Clinical Medicine and Surgery	Service Provision (SP)	Occasional Service	29/09/2021	19/10/2021	30/04/2022	31/12/2022	20	171.524,54	Active	X	4	Third-party Funding
2	X	DCCV – Department of Veterinary Clinical Medicine and Surgery	Service Provision (SP)	Occasional Service	22/11/2021	21/12/2021	01/05/2022	01/05/2023	29	420.412,50	Active	X	3	Third-party Funding
									49	591.937,04			7	
Considering these projects:			IDN	7/2=3,5 Dilig.		Total projects by DCCV Department	591.937,04							
			IDD	49/2=24,5 Dias		Total projects with third-party funding	591.937,04							
			IPA	No data available		Total Service Provision projects	591.937,04							
			IPR	No data available										

INDICATORS: Projects Submitted to SEI in 2022

Item	CENEx Entry Date (SEI)	Department	Extension Activity	Modality/Classification	Department Board Approval Date	CENEx Approval Date	Project Start Date	Project End Date	Days to Approval	Project Value	SIEX Status	Apoiex Revisions	CAP Revisions	Funding Source
PS1	16/02/2022	DCCV – Department of Veterinary Clinical Medicine and Surgery	Service Provision (SP)	Occasional Service	16/02/2022	25/02/2022	30/04/2022	31/12/2022	9	102.743,90	Active	2	5	Third-party Funding
PS2	13/04/2022	DMVP – Department of Preventive Veterinary Medicine	Service Provision (SP)	Occasional Service	04/04/2022	14/04/2022	01/05/2022	01/05/2023	10	573.325,00	Active	0	7	Third-party Funding
									19	676.068,90		2	12	
			Before Scrum	After Scrum										
Considering these projects:			12/2=6 Dilig.	2/2=1 Dilig.		Total projects by DCCV Department	102.743,90		Comparison:	2021	2022	Results		
		IDD	19/2=9,5 Dias	19/2=9,5 Dias		Total projects by DMVP Department	573.325,00		IDN	3,5 Dilig.	1 Dilig.	Improved, reducing revisions by 71.42%		
		IPA	No data available	No data available		Total projects with third-party funding	676.068,90		IDD	24,5 Dias	9,5 Dias	Improved, reducing approval time by 61.22%		
		IPR	No data available	No data available		Total Service Provision projects	676.068,90							

Source: Prepared by the authors.

The duration performance index substantially improved, with average processing time decreasing from 24.5 days to 9.5 days, a 61.22% reduction. This indicated a significant gain in process efficiency and confirmed the effectiveness of combining BPM-based redesign with agile project management practices. Similarly, the revision requests index per project decreased from an average of 3.5 to 1.0 revision requests per project, a 71.42% reduction. This improvement reflected increased conformity of project submissions and reduced rework, suggesting that the redesigned process and Scrum-based coordination improved clarity and guidance for project proponents. As for the project effectiveness index, which was used as a composite indicator, there was a clear improvement in overall process performance by integrating gains in both duration and conformity. The combined reduction in processing time and diligences

indicated that the intervention accelerated the process and improved its quality.

These results corroborate research highlighting the role of agile methods in improving efficiency in complex organizational environments (Mergel, 2016; Rigby et al., 2016). They also support recent arguments in favor of more adaptive and flexible process management approaches (e.g., agile BPM), which seek to combine structural clarity with iterative adaptation (Badakhshan et al., 2019). Unlike prior studies, our findings showed that such improvements are especially relevant when agile practices are embedded within a formally redesigned and institutionally compliant process.

Despite these positive results, implementation was not free of challenges. Adapting Scrum to a highly formalized public sector context required compromises such as reduced meeting frequency, role accumulation, and limited flexibility in decision-making. Regulatory requirements and formal approval stages restricted the extent to which agile principles could be fully implemented.

Resistance to changes in established routines and the need for cultural adaptation were also relevant challenges, reinforcing the argument that process improvement initiatives are not purely technical but also organizational and behavioral (Mergel et al., 2019; vom Brocke & Rosemann, 2013).

The results suggest that the effectiveness of Scrum in public organizations depends less on strict methodological fidelity and more on its ability to coexist with institutional constraints. This interpretation is consistent with recent BPM research conducted in public and university organizations, which have explored the use of process-oriented approaches, performance indicators, and optimization mechanisms in academic administrative contexts (Kissa et al., 2023; Renna & Colonnese, 2025). In this regard, this study indicates that BPM initiatives may yield better results when combined with adaptive coordination mechanisms capable of operating within institutional constraints.

5 FINAL CONSIDERATIONS

This study analyzed the application of the Scrum framework to improve the processing of extension projects in a Brazilian IFES, integrating agile project management practices with BPM. Using an action research approach with quantitative support, the study combined process diagnosis, redesign, implementation, and performance evaluation.

Our findings indicated that integrating BPM and Scrum led to significant improvements in process efficiency, reducing both processing time and rework levels. From a theoretical perspective, the study advances the understanding of how agile methods can be effectively integrated with structured process management approaches in highly formalized public sector contexts. By demonstrating the complementarity between BPM and Scrum, this study moves beyond the traditional dichotomy between flexibility and control, showing that these dimensions can be combined rather than treated as mutually exclusive.

From a practical perspective, the results provide actionable insights for public and academic managers seeking to improve administrative processes without compromising regulatory compliance. The proposed model illustrates how agile practices can be adapted and embedded within formal organizational structures, offering a feasible pathway for reducing bureaucratic inefficiencies while preserving institutional control.

Despite these contributions, this study has limitations. The analysis was restricted to a single case and a limited number of projects, constraining the generalizability of the findings. Additionally, the study focused primarily on efficiency-related indicators, neglecting qualitative dimensions such as stakeholder satisfaction and long-term organizational impacts.

Future research could extend the application of the proposed model to different institutional contexts and types of projects, as well as incorporate qualitative performance measures. Longitudinal studies would be particularly valuable for assessing the sustainability of agile practices in public sector environments. Comparative studies

involving different agile frameworks may also contribute to a more comprehensive understanding of their relative effectiveness.

Overall, the results suggest that the effectiveness of integrating BPM and Scrum depends not only on methodological adoption but also on alignment with organizational context and institutional constraints. This reinforces the importance of contextualized managerial innovation in public organizations. In this sense, this study highlights that combining structured process management with adaptive practices represents a promising approach for improving administrative performance in public HEIs. In conclusion, aligning agile project management with structured process redesign represents a promising pathway for enhancing administrative performance in public HEIs, reinforcing the role of managerial innovation as a strategic element in public sector modernization.

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3. Formal analysis	√	
4. Funding acquisition		
5. Investigation	√	
6. Methodology	√	√
7. Project administration	√	√
8. Resources	√	√
9. Software		
10. Supervision		√
11. Validation		√
12. Visualization		√
13. Writing – original draft	√	
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