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PROJECT MANAGEMENT PRACTICES IN RESIDENTIAL RENOVATION: A CASE STUDY OF A BRAZILIAN CONSTRUCTION MICRO-ENTERPRISE

PRÁTICAS DE GERENCIAMENTO DE PROJETOS EM REFORMA RESIDENCIAL: ESTUDO DE CASO DE UMA MICROEMPRESA BRASILEIRA DE CONSTRUÇÃO

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ABSTRACT: Micro and small enterprises (MSEs) constitute a crucial component of the Brazilian economy, representing approximately 99% of all businesses and accounting for about 30% of the national gross domestic product (GDP). Among these enterprises, approximately 1% operates in architecture and engineering services. Despite their economic relevance, MSEs often face difficulties in adopting formal management practices, which can limit their competitiveness. Project management provides a structured approach to achieving organizational objectives, fostering growth, and promoting innovation. This study assesses the project management practices adopted by a Brazilian micro-enterprise operating in the residential renovation sector, using the process groups defined in the PMBOK Guide as an analytical framework. Data were collected through a structured questionnaire, semi-structured interviews, and document analysis. The findings indicate that, although the company adopts some recommended practices – such as project charter development and scope planning – these practices are applied informally and incompletely. Significant deficiencies were identified in risk management, which contributed to project delays and financial losses. The study underscores the importance of disseminating project management knowledge among MSEs as a means of enhancing organizational performance and maturity.

KEYWORDS: Project management; Management practices; Micro and small enterprises; Renovation; PMBOK.

RESUMO: Micro e pequenas empresas (MPEs) são cruciais para a economia brasileira, representando 99% de todos os negócios e contribuindo com 30% do PIB nacional. Entre estes, 1%, aproximadamente, são de serviços de arquitetura e engenharia. Apesar de sua importância, as MPEs muitas vezes enfrentam desafios na adoção de práticas formais de gestão, limitando assim sua competitividade. O gerenciamento de projetos oferece uma abordagem estruturada para atingir objetivos e promover o crescimento e a inovação. Este estudo avalia as práticas de gestão de projetos utilizadas por uma microempresa brasileira no setor de reforma residencial, utilizando os grupos de processos definidos no Guia PMBOK como uma estrutura analítica. Os dados foram coletados por meio de questionário, entrevistas semiestruturadas e análise de documentos. As descobertas indicam que, embora a empresa adote algumas práticas recomendadas, como o levantamento de requisitos e o planejamento de escopo, elas são aplicadas de forma informal e/ou incompleta. Deficiências significativas foram observadas na gestão de riscos, o que contribuiu para

atrasos no projeto e perdas financeiras. O estudo ressalta a importância de disseminar o conhecimento de gerenciamento de projetos entre os MPEs para melhorar o desempenho e a maturidade organizacional.

PALAVRAS CHAVE: Gerenciamento de projetos; Práticas de gerenciamento; Micro e pequenas empresas; Renovação; PMBOK.

1. INTRODUCTION

Renovation projects have gained increasing relevance in recent years, as urban densification, changes in household composition, and sustainability concerns have intensified the demand for adapting existing buildings rather than replacing them (Shahi *et al.*, 2020). In the Brazilian context, residential renovation represents a significant and growing market segment. A national survey indicated that approximately 69% of respondents intended to carry out some type of renovation in their homes in 2024 (AGP, 2023). According to ABNT NBR 16280 (ABNT, 2022), renovation projects encompass any intervention aimed at modifying, improving, restoring, or expanding an existing building, involving technical, managerial, and regulatory complexities that distinguish them from new construction projects.

Residential renovation projects are predominantly developed by micro and small enterprises (MSEs), particularly architecture and engineering offices operating with reduced teams and limited resources (Joblot et al., 2019). These organizations are typically characterized by a small number of employees, restricted production capacity, limited economies of scale, and low bargaining power (Jucá Júnior; Conforto; Amaral, 2010). In Brazil, MSEs account for approximately 99% of all active companies, contribute around 30% of the national gross domestic product, and generate more than half of formal employment (SEBRAE, 2020). Despite their economic relevance, MSEs frequently operate with a high degree of informality and limited technical and managerial knowledge, particularly with respect to structured project management practices (Neves *et al.*, 2014; Melo; Carneiro; Telles, 2022).

The competitive environment in which MSEs operate has become increasingly complex due to globalization, rapid technological change, and growing client expectations regarding quality, cost, and deadlines (Mannan; Khurana; Haleem, 2016). In this context, project management has been widely recognized as a managerial approach capable of improving organizational performance by structuring decision-making processes, aligning stakeholder expectations, and enhancing control over scope, time, cost, and risks (PMI, 2017). Empirical studies have consistently associated the adoption of project management practices with improved project success rates, productivity gains, and financial performance across different sectors and organizational sizes (Patah; Carvalho, 2009; Badewi, 2016; Fernandes et al., 2019; Kaufmann; Kock, 2022).

The Project Management Body of Knowledge (PMBOK Guide), developed by the Project Management Institute (PMI), consolidates internationally recognized best practices in project management and organizes them into five process groups: initiating, planning, executing, monitoring and controlling, and closing (PMI, 2017). Although the PMBOK Guide emphasizes that its practices should be tailored to the organizational context, firm size, and project characteristics, studies indicate that micro and small enterprises (MSEs) face difficulties in adopting formal and systematic project management processes due to limited resources, lack of specialized knowledge, and the perceived bureaucracy associated with standardized frameworks (Turner; Ledwith; Kelly, 2010, 2012).

Previous research has examined project management practices in MSEs across different industries, highlighting patterns of informal adoption, selective use of tools, and adaptations driven by organizational constraints (Turner; Ledwith; Kelly, 2009; Pollack; Adler, 2016; Owalla *et al.*, 2022). However, the existing literature reveals two notable gaps. First, there is a limited number of empirical studies focusing specifically on the residential renovation sector, which presents distinctive characteristics such as high levels of uncertainty, strong stakeholder involvement, frequent scope changes, and elevated exposure to risk. Second, within the Brazilian context, studies addressing project management practices in micro-enterprises operating in residential renovation remain scarce, particularly those adopting an in-depth qualitative approach.

In response to these gaps, this study investigates how project management practices are applied in a Brazilian architecture and engineering micro-enterprise operating in the residential renovation sector, using the PMBOK Guide process groups as an analytical framework. Rather than proposing or validating a project management maturity model, the study adopts an exploratory and diagnostic perspective, aiming to assess the extent to which the company's practices comply with, partially comply with, or diverge from the practices suggested by the PMBOK Guide.

Accordingly, the research is guided by the following research question: How are project management practices applied in a Brazilian micro-enterprise operating in residential renovation projects, and to what extent do these practices align with the PMBOK process groups? To address this question, a qualitative single-case study was conducted, combining data from a structured questionnaire, semi-structured interviews, and document analysis.

The contributions of this research are twofold. From a theoretical perspective, it advances the understanding of project management practices in micro-enterprises within the underexplored context of residential renovation, reinforcing the discussion on the need to adapt established project management frameworks to small organizational settings. From a practical perspective, the study provides a structured

diagnostic approach that can support micro and small enterprises in identifying strengths, weaknesses, and opportunities for improvement in their project management practices.

This paper is structured as follows. Section 2 presents the literature review on project management in micro and small enterprises and in the construction and renovation sector, highlighting the main research gaps. Section 3 describes the research methodology, including the case study design, data collection instruments, and analysis procedures. Section 4 presents and discusses the results of the case study. Finally, Section 5 outlines the main conclusions, limitations, and directions for future research.

2. LITERATURE REVIEW

2.1. PROJECT MANAGEMENT IN MICRO AND SMALL ENTERPRISES

Micro and small enterprises (MSEs) play a fundamental role in economic development; however, they exhibit organizational characteristics that differ substantially from those of large corporations, particularly with regard to the formalization of managerial processes. In project-based environments, MSEs typically operate with lean organizational structures, limited financial and human resources, and a strong reliance on the tacit knowledge and experience of founders or owner-managers (Turner; Ledwith; Kelly, 2009).

Empirical evidence suggests that, although MSEs generally acknowledge the relevance of project management, the adoption of formal methodologies tends to be selective, informal, and highly contextualized. Turner, Ledwith, and Kelly (2010, 2012) argue that standardized project management frameworks are often perceived by small firms as excessively bureaucratic and misaligned with their operational realities. Consequently, project management practices in MSEs are frequently adapted in a pragmatic manner, focusing primarily on short-term operational concerns such as cost control, deadline compliance, and client satisfaction (Pollack; Adler, 2016).

Despite these constraints, the literature consistently demonstrates that the adoption of project management practices – when appropriately tailored – can generate significant benefits for MSEs. Several studies associate project management with improved organizational performance, enhanced decision-making processes, greater predictability of outcomes, and increased project success rates (Patah; Carvalho, 2009; Badewi, 2016; Fernandes *et al.*, 2019; Kaufmann; Kock, 2022). These findings indicate that the main challenge faced by MSEs is not the lack of relevance of project management, but rather the need to adapt established frameworks to their

specific scale, resource limitations, and maturity levels.

2.2. PROJECT MANAGEMENT IN CONSTRUCTION AND RESIDENTIAL RENOVATION PROJECTS

The construction industry is widely recognized as a project-based sector characterized by high levels of complexity, uncertainty, and interdependence among multiple stakeholders. Within this industry, residential renovation projects present additional challenges when compared to new construction projects, including incomplete or unreliable information about existing buildings, frequent scope changes, regulatory constraints, and close and continuous interaction with end users (Shahi *et al.*, 2020).

The literature highlights that renovation projects require flexible and adaptive management approaches capable of addressing uncertainty and supporting iterative decision-making processes (Joblot *et al.*, 2019). However, in practice, residential renovation projects – particularly those conducted by micro and small enterprises (MSEs) – are often managed informally, relying heavily on experiential knowledge rather than on structured planning, risk management, and control mechanisms (Daniotti et al., 2022). This informality tends to intensify common project-related problems, such as delays, cost overruns, rework, and conflicts with clients and suppliers.

Although project management has been extensively studied in the construction sector, a substantial portion of the literature focuses on large-scale projects, infrastructure developments, or the implementation of advanced digital tools, such as Building Information Modeling (BIM). Comparatively fewer studies address small-scale residential renovation projects, especially from the perspective of managerial practices adopted by micro and small enterprises. This imbalance limits the understanding of how established project management frameworks can be realistically applied and adapted to the specific constraints and characteristics of this segment.

2.3. RESEARCH GAPS AND POSITIONING OF THE STUDY

The literature review reveals two interrelated research gaps. First, while project management practices in small and medium-sized enterprises (SMEs) have been widely examined, empirical studies focusing specifically on micro-enterprises remain limited, particularly in developing countries, where structural and resource constraints tend to be more pronounced. Second, within the construction domain, residential renovation projects carried out by small firms have received relatively little scholarly attention when compared to new construction and large-scale projects.

In the Brazilian context, these gaps are even more evident. Existing studies tend to address project management in MSEs in a broad and generic manner or focus primarily on technical, regulatory, and technological aspects of renovation projects, with limited integration between managerial and sector-specific perspectives. Consequently, there is a lack of in-depth qualitative research examining how project management practices are actually implemented in micro-enterprises operating in the residential renovation sector and how these practices align with internationally recognized frameworks, such as the PMBOK Guide.

Positioned at the intersection of these gaps, the present study adopts the PMBOK Guide process groups as an analytical lens to conduct an exploratory and diagnostic assessment of project management practices in a Brazilian architecture and engineering micro-enterprise. By focusing on a single case, the study seeks to contribute to the theoretical discussion on the adaptation of project management frameworks to small organizational contexts and to provide practical insights for micro and small enterprises involved in residential renovation projects.

3. MATERIALS AND METHODS

3.1. RESEARCH DESIGN

This study adopts a qualitative research approach based on a single-case study strategy. Case studies are particularly suitable for exploratory investigations that seek to understand contemporary phenomena within their real-life context, especially when the boundaries between the phenomenon and its context are not clearly defined (Yin, 2021). In the present research, the case study design enables an in-depth examination of project management practices as they are actually applied in a micro-enterprise operating in the residential renovation sector.

The choice of a single case is justified by the exploratory nature of the research and by the limited availability of empirical studies addressing project management practices in Brazilian micro-enterprises engaged in residential renovation projects. Rather than aiming for statistical generalization, this study seeks analytical generalization by generating insights that may be transferable to organizations with similar characteristics (Yin, 2021).

3.2. CASE SELECTION AND CHARACTERIZATION

The selected case is a Brazilian architecture and engineering micro-enterprise located in the state of Santa Catarina, which has been operating in the residential renovation market since 2018. According to Brazilian legislation (Brasil, 2006), a micro-enterprise is defined as a firm with annual gross revenue of up to BRL 360,000. At the

time of data collection, the company met this criterion and employed two professionals – a civil engineer and an architect – who are also its co-founders.

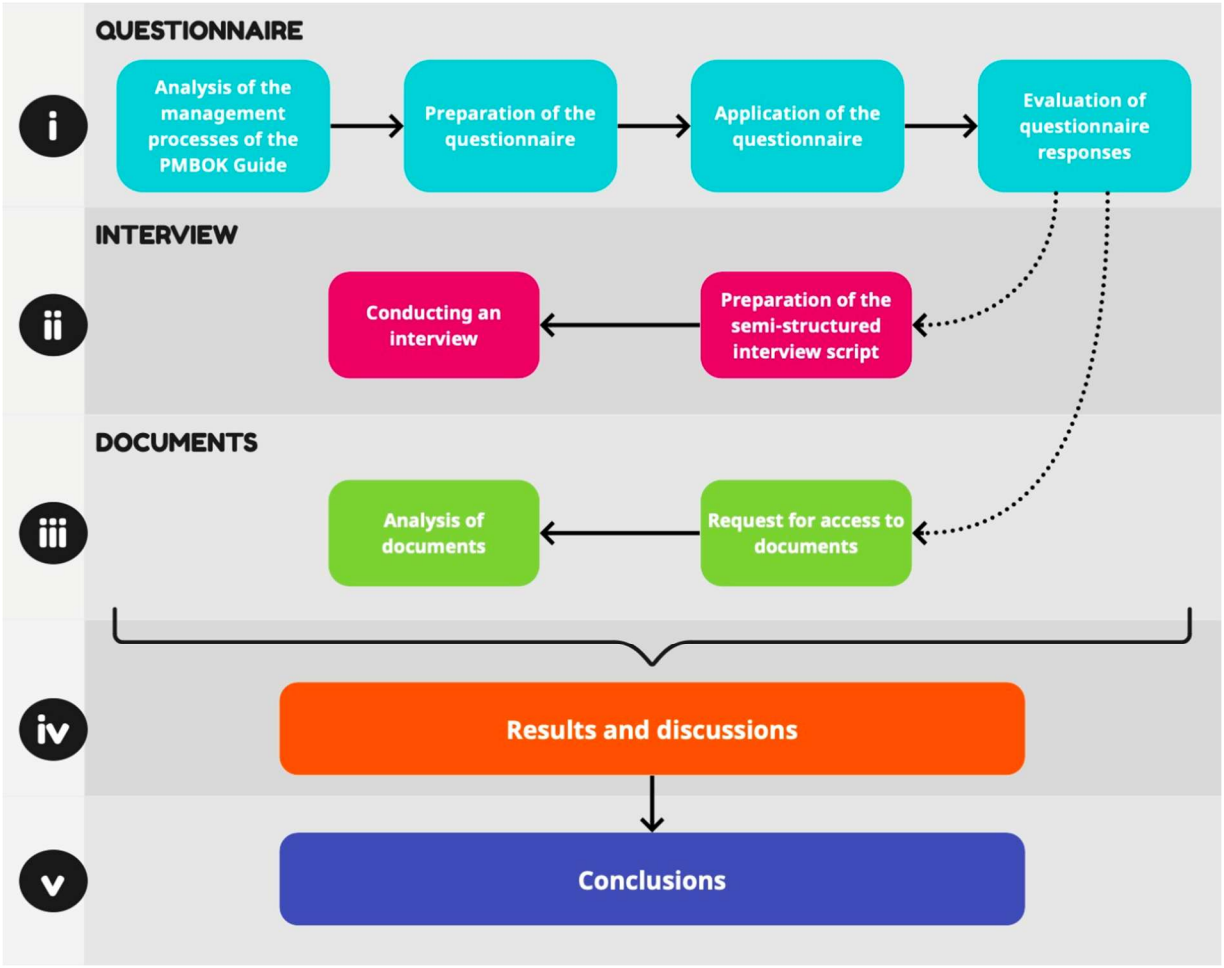
The company develops residential renovation projects covering both design and execution management and had completed 14 projects between 2018 and 2021, which constitute the empirical basis of this study. Prior to data collection, preliminary interactions with the company indicated the absence of formal project management methodologies, standardized procedures, or documented project management plans. Project-related decisions were primarily based on professional experience and informal coordination practices, which makes the company a relevant and information-rich case for achieving the objectives of this research.

3.3. DATA COLLECTION PROCEDURES

Data were collected through the triangulation of three sources: a structured questionnaire, semi-structured interviews, and the analysis of project-related documents. The use of multiple sources enhances the validity of the findings by enabling cross-verification of information and reducing the risk of bias associated with reliance on a single data collection method (Yin, 2021).

The data collection process followed five sequential phases: (i) application of the questionnaire; (ii) development and conduction of semi-structured interviews; (iii) document analysis; (iv) integrated analysis, synthesis, and interpretation of the collected data; and (v) conclusions and final considerations (Figure 1).

Figure 1. Study development flowchart



3.4. DEVELOPMENT OF THE QUESTIONNAIRE

The questionnaire was developed using the PMBOK Guide (PMI, 2017) as an analytical framework. Specifically, the five process groups – initiating, planning, executing, monitoring and controlling, and closing – were used to structure the instrument. The questions were derived from the processes and principal outputs associated with each process group, aiming to assess whether the company performed activities conceptually aligned with the practices recommended by the PMBOK Guide.

Rather than evaluating the respondents' technical mastery of project management terminology, the questionnaire focused on the existence of practices and routines corresponding to PMBOK processes, translated into operational and accessible language suitable for a micro-enterprise context. In total, the questionnaire comprised two sections: (1) six general questions related to company characterization

and research consent; and (2) fifty-eight specific questions distributed across the five PMBOK process groups.

The response format was dichotomous (“yes” or “no”), indicating whether the company performed the described practice. Although Likert-type scales can provide a more nuanced assessment of partial adherence, the dichotomous format was intentionally adopted to ensure clarity, reduce respondent ambiguity, and facilitate consensus-based responses between the two partners of the company. Partial compliance with PMBOK recommendations was subsequently inferred through the aggregation of responses at the process group level, expressed as percentages, in accordance with the analytical scale presented in Table 1.

Table 1. Classification criteria by process group

Percentage	Evaluation
0 - 40%	Diverge
41 - 70%	Partially comply
71 - 100%	Comply

3.5. SEMI-STRUCTURED INTERVIEWS

Based on the questionnaire results, a semi-structured interview guide was developed to deepen the understanding of the company’s practices and to clarify ambiguities identified in the responses. Semi-structured interviews were selected due to their flexibility and suitability for exploratory research, as they allow respondents to elaborate on their experiences and perceptions beyond predefined questions (Knott *et al.*, 2022).

The interviews were conducted with the two co-founders of the company, lasted approximately 30 minutes each, and were carried out online. With the participants’ consent, the interviews were recorded and subsequently transcribed. Data analysis followed a thematic approach, focusing on confirming questionnaire responses, identifying informal practices, and understanding the practical consequences of the absence or partial adoption of project management processes.

3.6. DOCUMENT ANALYSIS AND AGGREGATION OF RESULTS

Document analysis was conducted to verify the existence and characteristics of project outputs reported by the company, as well as to identify undocumented

practices. The analyzed materials included contracts, schedules, cost estimates, drawings, reports, and project closure documents related to the 14 projects completed during the study period. This procedure enabled a comparison between declared practices and actual project artifacts, thereby strengthening data triangulation and increasing the reliability of the findings.

Data analysis combined the quantitative aggregation of questionnaire responses with the qualitative interpretation of interview and document analysis findings. For each PMBOK process group, the number of affirmative responses was divided by the total number of questions in that group, resulting in a percentage score. These scores were classified as low, medium, or high compliance according to predefined thresholds (Table 2).

Table 2. Overall evaluation criteria

Percentage	Evaluation
0 - 40%	Low compliance
41 - 70%	Medium compliance
71 - 100%	High compliance

The overall evaluation of the company's project management practices was obtained by aggregating the results across the five process groups. It is important to note that the interviews and document analysis did not generate additional numerical scores; instead, they provided qualitative evidence to support, explain, and contextualize the questionnaire results. This integrative approach enabled a comprehensive and nuanced assessment of project management practices within the studied micro-enterprise.

4. RESULTS AND DISCUSSION

The analysis of the questionnaire responses indicates that the studied company applies several project management practices in an informal and non-systematized manner. Although the company does not possess formal training in project management nor adopts standardized methodologies, practices aligned with the PMBOK Guide are partially present across all five process groups. This finding corroborates previous studies suggesting that small firms often implement project management practices intuitively, driven more by practical necessity than by formal methodological awareness (Turner; Ledwith; Kelly, 2012; Pollack; Adler, 2016).

The overall level of compliance with PMBOK recommendations was classified as medium, based on the aggregation of the scores obtained for the five process groups. It is important to emphasize that this classification does not constitute a project management maturity assessment; rather, it represents a diagnostic snapshot of the company's current practices, derived from the relative frequency of activities aligned with PMBOK processes.

4.1. INITIATING PROCESS GROUP

The initiating process group comprises the processes performed to formally characterize and authorize a new project, with the primary objective of aligning stakeholder expectations with project objectives and defining their involvement throughout subsequent phases (PMI, 2017). Within this process group, initial project definitions are established, and preliminary financial forecasts are developed. For the purposes of this study, four questions related to the initiating process group were included in the questionnaire, and the corresponding responses are presented in Table 3.

Table 3. Initiating process group

Question	Yes	No
Before starting the project, do you discuss with clients their expectations, assumptions, deadlines, possible solutions, constraints, and personal preferences to be considered during project development?		
Before starting the project, is a document prepared that defines the project's purpose, objectives, characteristics, assumptions, requirements, preliminary financial forecast, and constraints guiding project development?		
Before the start of project activities, is a meeting held with the team to discuss proposed solutions, ideas, and project requirements?		
Before the start of project activities, are the people, teams, and suppliers involved in the project – both internal and external to the company – identified?		
Result	75%	25%

According to the interviews conducted with the company's partners, the initiating process effectively begins after approval of the initial budget and the signing of the contract. Document analysis revealed that the contract functions as the main mediating instrument between the company and its clients. When compared with the

concepts presented by the PMBOK Guide (PMI, 2017), the contract assumes a role analogous to that of a project charter, as it authorizes the start of the project and outlines its purpose, objectives, expected results, as well as key assumptions and constraints guiding project development.

Based on the questionnaire responses, it was observed that the company does not formally define or document project stakeholders prior to the commencement of planning processes. However, during the interviews, the partners emphasized that stakeholder identification is treated as an iterative activity. As stated by one of the respondents: “Although it is recommended to define all those involved in the project before its start, in the construction industry we depend on specifications and the availability of teams, labor, and supplies, which makes this stage iterative throughout project development.” This perception is consistent with the literature, which highlights the dynamic nature of stakeholder involvement in construction projects and the benefits of early and continuous stakeholder engagement for project performance and success (Davis, 2017).

Among the five PMBOK process groups, initiating presented relatively higher compliance. The company consistently performs informal project authorization, identifies key stakeholders, and defines initial objectives through direct interaction with clients. This behavior reflects a typical characteristic of micro-enterprises, in which decision-making is highly centralized and stakeholder relationships are managed personally by the owners. Nevertheless, the absence of a formal project charter and a documented stakeholder analysis may increase exposure to risks, particularly in residential renovation projects, where client expectations frequently evolve during execution. Interview data indicated that misunderstandings regarding scope occasionally resulted in renegotiations and rework. To mitigate these issues, the adoption of simplified initiation artifacts – such as a one-page project charter or a basic stakeholder register – could enhance clarity and alignment without imposing a significant administrative burden on the company.

4.2. PLANNING PROCESS GROUP

The planning process group comprises the processes responsible for establishing the initial project baseline. Within this group, the project scope is defined, objectives are refined and detailed, the activities required to achieve these objectives are identified, and the documents necessary for project development are prepared (PMI, 2017). Planning is inherently iterative and subject to continuous revision throughout the project life cycle, particularly in dynamic environments such as construction and renovation projects (PMI, 2017). To assess this process group, seventeen questions related to the processes suggested by the PMBOK Guide were

included in the questionnaire, and the corresponding responses are presented in Table 4.

Table 4. Planning process group

Question	Yes	No
Before starting project planning, is a document prepared that formalizes how the project will be developed, monitored, controlled, and closed?		
Is a meeting held with the team to define the main guidelines and methodologies to be adopted for project development?		
Based on client requirements and the organization's technical capacity, are the guiding requirements for project development documented? Does this document include client requests, scope boundaries, technical specifications, site context, and applicable legal constraints?		
Is a document prepared detailing all the work to be performed during project development and the deliverables to be produced until project closure?		
Is the included and excluded deliverables from the project scope documented and made available to all relevant stakeholders?		
Are project deliverables decomposed into work packages and organized in a visual structure that indicates dependencies among them?		
Are the activities required to produce the project deliverables defined and documented?		
Are the activities required to produce the project deliverables organized in a logical sequence of execution?		
Is the duration required to complete each project activity estimated?		
Is a schedule or timeline prepared to represent the timing and sequence of project activities?		
Is the cost of each project activity estimated?		
Is an estimate of the total project cost prepared?		
Are the main resources – such as personnel, materials, equipment, and supplies – required to perform each activity estimated?		
Are potential project risks, uncertainties, and sources of risk identified?		
Are identified risks, uncertainties, and sources of risk categorized according to their probability of occurrence?		
Are the potential impacts of identified risks and uncertainties on the project		

Table 4. Planning process group

Question	Yes	No
assessed? In the event of risk exposure, is a response plan defined that specifies alternatives and/or strategies to be implemented?		
Result	53%	47%

Analysis of the questionnaire responses revealed that the company answered “no” to the questions related to the development of a project management plan and to the collection of requirements. The project management plan establishes the foundation for all project work and defines how the project will be executed, monitored, and controlled, while requirements collection provides the basis for defining and managing project scope (PMI, 2017). The absence of these processes indicates a lack of structured guidance for project planning, which becomes evident in subsequent stages and results in ambiguity regarding what should be done and how it should be accomplished (Pollack; Adler, 2016).

The company also answered “no” to all questions related to risk management processes, including risk identification, qualitative analysis, quantitative analysis, and response planning. Deficiencies in risk management among small firms have been widely reported in the literature. Turner, Ledwith, and Kelly (2012), for instance, observed that only 43% of the small businesses analyzed in their field study had risk management established as a standard organizational process. This limitation may be explained by the risk appetite commonly observed in firms of this size, as well as by a lack of knowledge and familiarity with formal risk management practices (Ngah; Wong, 2020).

During the interviews, the partners were asked to elaborate on the absence of a formal project management plan and documented requirements. Regarding the project management plan, they stated that they were unaware of this process as defined in the PMBOK Guide but expressed openness and interest in adopting it as a standard practice within the office. Concerning requirements documentation, the partners indicated interest in implementing this process in the future, particularly in the event of organizational growth and team expansion. With respect to risk planning, the partners reported that none of the formal risk management processes were performed and that they did not perceive an immediate need to systematically map risks. Nevertheless, they acknowledged having experienced negative consequences – such

as delays, rework, and increased costs – directly associated with the absence of risk identification and response planning. This finding is consistent with the literature, which associates the lack of risk management in MSEs with schedule delays and higher operational costs (Testorelli; Ferreira; Verbano, 2022).

Document analysis corroborated the questionnaire and interview findings. No documents were identified that indicated the existence of processes related to the development of a project management plan, requirements definition, or risk management activities. Additionally, although cost estimates and schedules were prepared for all projects, these artifacts were not documented within a structured planning framework and did not follow the sequence recommended by the PMBOK Guide (PMI, 2017). Despite this informality, the resulting schedules were generally complete and detailed, reflecting the company's reliance on experiential knowledge.

Overall, the planning process group exhibited partial compliance, with significant gaps in scope definition, risk management, and communication planning. While cost estimation and scheduling practices are consistently applied, they are not integrated into a formal project management plan. Instead, planning activities are conducted independently and revised reactively as problems emerge. This fragmented approach is particularly problematic in residential renovation projects, where unforeseen conditions – such as hidden structural issues or outdated building systems – are common. The absence of formal risk identification and response planning increases the company's exposure to cost overruns and schedule delays. From a practical perspective, the adoption of simple planning instruments – such as basic requirement checklists and risk registers derived from prior projects – could substantially improve planning effectiveness without imposing excessive complexity or administrative burden on the micro-enterprise.

4.3. EXECUTING PROCESS GROUP

The executing process group involves coordinating resources, managing stakeholder engagement, and performing project activities in accordance with the established plan, with the objective of delivering the project outcomes in line with defined requirements (PMI, 2017). The assessment of this process group was conducted through a questionnaire comprising sixteen questions, as presented in Table 5.

Table 5. Executing process group

Question	Yes	No
Are project teams guided and led in the execution of assigned activities?		

Table 5. Executing process group

Question	Yes	No
Is the company's existing knowledge effectively applied during project execution?		
Is the knowledge generated during the project documented and stored to support future projects?		
During project execution, are deliverables monitored to ensure the quality of the final outcomes?		
When required for project execution, is the hiring of personnel and the acquisition of equipment, materials, and/or supplies supervised?		
Is the development and improvement of team skills encouraged and/or supported?		
Is the work performed by the team monitored, and is the performance of individual members evaluated?		
Does the company promote a culture of feedback within the project team?		
Is there a standardized internal channel for exchanging project-related information with the team?		
Is there a standardized channel for exchanging project-related information between the company and external stakeholders?		
Is project-related information systematically organized and archived?		
When project problems arise, are the solutions typically anticipated or previously defined?		
Are suppliers predominantly selected by the company?		
Is communication with suppliers primarily managed by the company?		
Is communication with stakeholders planned and conducted on a regular basis?		
Is there a standardized channel for keeping stakeholders informed about project status and progress?		
Result	50%	50%

Analysis of the questionnaire responses indicates that two processes within this group were particularly deficient: communication management and stakeholder engagement management. Communication management is responsible for collecting,

storing, distributing, and managing project information to ensure an efficient and effective flow of information among the project team and stakeholders, while stakeholder engagement management focuses on communicating and working with stakeholders to obtain support and minimize resistance throughout the project life cycle (PMI, 2017). Given their interdependence, deficiencies in one process tend to directly affect the other. Both were identified as weakly implemented in the studied company.

During the interviews, the partners were asked to describe how project communication is conducted internally and externally. The findings revealed that the company does not adopt standardized communication procedures. Communication with team members, clients, and other stakeholders is primarily conducted through instant messaging applications, which are also used for personal communication. As a result, project-related information is exchanged informally, without systematic organization or documentation, leading to the loss of relevant information over time. Similar communication shortcomings have been associated with negative impacts on project performance in small organizations, particularly affecting coordination and stakeholder alignment (Carvalho; Patah; Bido, 2015). The partners reported having experienced communication-related problems during project execution, which subsequently affected other project management processes.

Conversely, two processes within the executing group were positively highlighted: quality management and procurement management. According to the questionnaire responses and interview data, the company closely monitors the execution of activities to ensure that deliverables meet the expected quality standards. Internal quality criteria are informally applied to verify project outputs. Regarding procurement, the company actively selects suppliers and products that meet its quality requirements and supervises purchasing, negotiation, and verification activities, indicating a relatively structured approach despite the absence of formal procedures.

The results also suggest that project knowledge management is only partially implemented. Interview data revealed that knowledge generated during projects remains largely tacit and individualized, with no formal documentation or repositories to support organizational learning. While this approach may be adequate for the company's current size and structure, it poses limitations for scalability and continuity. As organizational growth occurs, the concentration of knowledge in individuals may hinder performance and resilience. The literature emphasizes that documenting and sharing knowledge enhances decision-making efficiency and prevents the need to repeatedly recreate solutions (Shinoda; Maximiano; Sbragia, 2015; Ngah; Wong, 2020).

As expected, the implementation of risk response actions during execution was found to be nonexistent, reflecting the absence of risk management processes during

the planning stage. This finding reinforces the interdependence between planning and execution and highlights how deficiencies in earlier process groups propagate throughout the project life cycle.

Overall, the executing process group demonstrates a mixed performance. The company exhibits strong capabilities in team coordination and client interaction, which can be attributed to its small size and the direct involvement of the partners in daily operations. Informal communication and close relationships facilitate rapid decision-making and flexibility. However, the heavy reliance on tacit knowledge and the absence of standardized documentation create vulnerabilities. Interview data suggest that knowledge transfer is limited and that the lack of execution records could negatively affect performance in scenarios involving team expansion or temporary unavailability of key individuals. From a practical standpoint, the adoption of simple execution logs, shared digital folders, or standardized templates for recurring activities could help convert tacit knowledge into explicit organizational assets, strengthening execution without imposing excessive administrative complexity.

4.4. MONITORING AND CONTROLLING PROCESS GROUP

The monitoring and controlling process group aims to collect project performance data and compare actual performance with the planned baseline, generate and disseminate performance measurements, analyze deviations, and support process improvements. This group encompasses the processes required to monitor, analyze, and regulate project progress and performance, identify the need for changes to established plans, and initiate the corresponding corrective or preventive actions (PMI, 2017). The assessment of this process group was conducted through a questionnaire comprising eighteen questions, as presented in Table 6.

Table 6. Monitoring and controlling process group

Question	Yes	No
Is the execution of project activities regularly monitored?	■	
Is the monitoring of project activities based on predefined performance indicators?		■
Is a project status report regularly produced, comparing actual progress with the planned baseline?		■
Are stakeholders regularly informed about project progress?	■	
When deviations from the plan occur, are corrective actions implemented in a timely manner?	■	

Table 6. Monitoring and controlling process group

Question	Yes	No
Is there a standardized document or procedure for requesting changes to an ongoing project?		
Are change requests subjected to feasibility analysis before approval?		
Are partial project deliverables reviewed to verify compliance with specified requirements?		
Are project execution activities periodically reviewed to ensure adherence to approved plans?		
Are project activities and deliverables regularly monitored to verify compliance with the planned schedule?		
Is the actual project cost regularly monitored and compared with the planned budget?		
Are deliverables regularly inspected to ensure completeness, correctness, and compliance with quality requirements?		
Is the early acquisition of resources carried out to ensure that activities can be executed as planned?		
Is the consumption of resources during project execution monitored and compared with estimated values?		
Are potential project risks regularly monitored?		
Are identified project risks periodically reviewed and updated?		
Is stakeholder engagement monitored to ensure active participation throughout the project?		
Is the satisfaction of project stakeholders monitored and assessed?		
Result	72%	28%

Based on the questionnaire responses, it can be concluded that the company regularly monitors and controls project execution, albeit in an informal manner. Processes such as scope validation, schedule control, cost control, quality control, resource control, and stakeholder monitoring were reported as being performed. The process of monitoring and controlling project work was also indicated as implemented, with the exception of practices related to the use of performance indicators and the adoption of standardized documents to track project status. These findings, when considered in conjunction with the results from other process groups, suggest that the

company does not employ standardized documentation templates nor performance indicators to support systematic monitoring and control activities.

The absence of standardized documentation and performance indicators limits the organization's ability to codify and retain project-related knowledge. The literature emphasizes that when both tacit and explicit knowledge are structured and formalized within an organization, organizational learning is enhanced, and knowledge becomes accessible in an explicit and reusable form (Saratchandra; Shrestha, 2022). As observed in previous process groups, risk monitoring and control were indicated as nonexistent, reflecting the absence of formal risk management practices during the planning stage.

During the interviews, the company's partners were asked to elaborate on the lack of document standardization and the non-use of indicators for project monitoring. Both confirmed that the company has few standardized documents, which results in additional workload, as documents are developed from scratch for each project. Regarding performance indicators, the partners stated that this was a management tool previously unknown to the company and expressed their intention to acquire knowledge about indicators and implement them for project monitoring and decision-making in the near future.

Overall, the monitoring and controlling process group exhibited lower levels of compliance, particularly with respect to performance measurement and change control. Although project progress is continuously observed through direct involvement of the partners, there are no formal metrics or systematic comparisons between planned and actual performance. Client-requested changes are typically managed informally, increasing the likelihood of scope creep. Given the dynamic and uncertain nature of residential renovation projects, the absence of structured change control mechanisms may result in cumulative impacts on project cost and schedule. From a practical perspective, the adoption of simplified control tools – such as basic performance indicators and a change request register implemented in spreadsheet format – could enhance transparency, support decision-making, and improve negotiation with clients without imposing excessive administrative demands on the micro-enterprise.

4.5. CLOSING PROCESS GROUP

The closing process group comprises the processes required to formally finalize and close the project, with the objective of completing all project-related activities and formally terminating contractual and administrative obligations (PMI, 2017). Within this group, the company concludes contracts with external stakeholders and formally delivers the project outputs. The closing process group also includes relevant internal

activities, such as conducting a meeting with the project team to reflect on project execution, document lessons learned to support future initiatives, and update organizational performance indicators. The assessment of this process group was conducted through a questionnaire consisting of three questions, as presented in Table 7.

Table 7. Closing process group

Question	Yes	No
Are formal project closure documents prepared at the end of the project?		
Is a post-project meeting held with the team to discuss project execution and document lessons learned?		
Are productivity, resource consumption, and organizational quality indicators updated at the end of the project?		
Result	33%	67%

Based on the questionnaire responses, it was observed that although the company formally concludes its projects, it does not conduct structured internal discussions with the project team, nor does it update performance indicators at the end of the project. The absence of internal meetings to reflect on project execution and document lessons learned results in the loss of valuable knowledge that could inform and improve future projects. The literature highlights that systematically documenting experiences related to suppliers, materials, techniques, and decision-making processes plays a critical role in facilitating learning and supporting more effective decisions in subsequent projects (Shinoda; Maximiano; Sbragia, 2015).

Document analysis revealed that the company adopts a standard project closure document in which stakeholders formally acknowledge the receipt and completion of the project. This document serves as a formal record of project delivery between the company and its stakeholders and provides legal protection against potential disputes, in line with the recommendations of the PMBOK® Guide (PMI, 2017).

Overall, the closing process group exhibited the lowest level of compliance among the five PMBOK process groups. While projects are considered completed once construction activities are finalized and payments are settled, formal closure practices – such as systematic documentation of lessons learned, post-project evaluations, and performance indicator updates – are largely absent. This limitation constrains organizational learning and the continuous improvement of project

management practices. In the context of a micro-enterprise, the consistent recording of lessons learned at the end of each project represents a low-cost and high-impact practice, particularly in a sector characterized by repetitive project types and similar execution patterns, such as residential renovations.

4.6. OVERALL EVALUATION

For the overall evaluation of the company, the partial results obtained for each PMBOK process group were aggregated, and an overall average level of compliance was calculated. The partial scores for each process group, as well as the final overall result, are summarized in Table 8.

Table 8. General evaluation of the company

Process groups	Yes	No
Initiating	75%	25%
Planning	53%	47%
Executing	50%	50%
Monitoring and controlling	72%	28%
Closing	33%	67%
General evaluation	59%	41%

Based on the questionnaire data, the company was classified as presenting an average level of compliance with the practices suggested by the PMBOK process groups (PMI, 2017). It is important to emphasize that this classification does not represent a project management maturity assessment. Rather, it reflects the extent to which practices aligned with the PMBOK Guide are present in the company's routine. Even in the absence of formal training or explicit knowledge of structured project management methodologies, the company applies several PMBOK-recommended practices in the execution of its projects, albeit informally and, in some cases, incompletely.

The analysis revealed a low level of process standardization within the company, which results in additional time being spent on activities that could otherwise be streamlined through standardized procedures. This lack of standardization was corroborated by document analysis, which showed that similar processes were documented differently across projects, with no consistent templates or formats.

During the interviews, the partners acknowledged that the absence of standardized processes constitutes a recurring challenge for the organization.

By triangulating data from the questionnaire, interviews, and document analysis, it was possible to identify a direct relationship between the absence of specific project management processes and the operational difficulties reported by the partners. For instance, the lack of formal stakeholder identification and the absence of a project management plan were associated with difficulties in defining responsibilities and allocating tasks among team members (Davis, 2017). Similarly, deficiencies in communication management were reflected in challenges related to information exchange between the project team and external stakeholders, as reported by the partners (Testorelli; Ferreira; Verbano, 2022).

All processes related to risk management were indicated as nonexistent in the questionnaire results. The limited adoption of risk management practices by micro-enterprises has been widely reported in the literature (Turner; Ledwith; Kelly, 2009). Although the absence of formal risk management is relatively common in organizations of this size, the interview data revealed that this deficiency had tangible negative consequences for the company, including decisions that adversely affected project schedules and costs.

Finally, the partial implementation of knowledge management practices was found to affect several other process groups. The lack of systematic mechanisms to capture and disseminate knowledge limits the organization's ability to leverage lessons learned from previous projects. Knowledge management enables organizations to reflect on accumulated experience, record insights for future use, and disseminate them among team members, thereby supporting more informed decision-making and continuous improvement (Shinoda; Maximiano; Sbragia, 2015; Saratchandra; Shrestha, 2022)

4.7. DISCUSSION AND IMPLICATIONS

The results indicate that the company's project management practices are strongly shaped by its micro-enterprise characteristics, particularly centralized decision-making, heavy reliance on experiential and tacit knowledge, and a low level of formalization. These features are widely reported in the literature on small organizations and project-based micro-firms (Turner; Ledwith; Kelly, 2009; Pollack; Adler, 2016; Ngah; Wong, 2020). Such characteristics explain both the strengths observed in the case – namely flexibility, rapid decision-making, and close relationships with clients – and the weaknesses identified, including limited documentation, reactive planning, and reduced capacity for organizational learning.

These weaknesses are further intensified by the specific context of residential

renovation projects. Unlike new construction, renovation projects are marked by high levels of uncertainty, incomplete information about existing conditions, frequent scope changes, and continuous interaction with end users (Joblot et al., 2019; Shahi et al., 2020; Daniotti et al., 2022). In this environment, the absence of structured initiation, planning, and change control processes increases the likelihood of cost overruns, schedule delays, rework, and conflicts with clients. As evidenced in the case study, informal management practices – while viable for small and less complex projects – tend to become bottlenecks as project complexity and stakeholder interdependence increase.

From a theoretical perspective, the findings reinforce the argument that established project management frameworks, such as the PMBOK Guide, should not be applied rigidly or in their entirety within micro-enterprises. Prior studies emphasize that excessive formalization may be perceived as bureaucratic and misaligned with the operational realities of small firms (Turner; Ledwith; Kelly, 2012; Pollack; Adler, 2016). Instead, the evidence supports a contingency-based and selective adoption of project management practices, in which only those processes that generate clear value are formalized and adapted to the organization's scale, resources, and maturity level (Patah; Carvalho, 2009; Badewi, 2016; Kaufmann; Kock, 2022).

From a practical standpoint, the study demonstrates that significant improvements in project performance do not necessarily require the full implementation of formal methodologies. Rather, micro-enterprises operating in the residential renovation sector can benefit substantially from the adoption of a limited set of simplified and low-cost practices. These include basic project authorization documents, minimum scope definition, simplified risk identification based on prior projects, standardized communication channels, and systematic recording of lessons learned. Similar recommendations are found in the literature on project management in small organizations, which highlights the effectiveness of incremental and context-sensitive improvements (Shinoda; Maximiano; Sbragia, 2015; Testorelli; Ferreira; Verbano, 2022).

To synthesize these findings and translate them into actionable guidance, Table 9 presents a set of practical implications organized by PMBOK process group. The table consolidates the main deficiencies identified in the case study and proposes feasible improvement actions aligned with the operational constraints of micro-enterprises in residential renovation projects.

Table 9. Practical implications by PMBOK process group for micro-enterprises in residential renovation projects

Process groups	Main Issues Identified	Practical Implications
Initiating	Lack of formal project charter and stakeholder documentation	Adoption of a simplified project charter (one-page document) including objectives, constraints, assumptions, and key stakeholders
Planning	Absence of integrated planning, scope definition, and risk management	Use of basic scope checklists, simplified schedules, cost summaries, and risk checklists derived from previous projects
Executing	Informal communication and concentration of knowledge in individuals	Standardization of communication channels and creation of simple execution logs to convert tacit knowledge into explicit records
Monitoring and controlling	No performance indicators or formal change control	Implementation of basic indicators (cost, schedule) and a simple change request register to control scope changes
Closing	Lack of lessons learned and post-project evaluation	Formalization of brief post-project review meetings and documentation of lessons learned for continuous improvement

Overall, the discussion highlights that the main challenge faced by micro-enterprises in residential renovation projects is not the absence of project management practices, but their informal, fragmented, and person-dependent nature. By selectively formalizing key processes and transforming experiential knowledge into organizational assets, micro-enterprises can enhance project predictability, reduce operational risks, and improve long-term performance without compromising their inherent flexibility.

5. CONCLUSIONS

This study examined how project management practices are applied in a Brazilian micro-enterprise operating in the residential renovation sector, using the PMBOK Guide process groups as an analytical framework. Through a qualitative single-case study and triangulation of data from a structured questionnaire, semi-structured interviews, and document analysis, the research provided an in-depth

diagnostic assessment of project management practices in a small organizational context.

The results show that, despite the absence of formal project management methodologies, the company applies several practices conceptually aligned with the PMBOK Guide in an informal, intuitive, and experience-driven manner. This pattern is consistent across all five process groups and reflects common characteristics of micro-enterprises, such as centralized decision-making, limited resources, and reliance on tacit knowledge. While this informality supports flexibility and close client interaction – particularly relevant in residential renovation projects – it also exposes the organization to risks related to scope definition, change control, performance monitoring, and organizational learning.

From a theoretical perspective, the study contributes to the literature by addressing two underexplored domains: project management in micro-enterprises and managerial practices in residential renovation projects. By empirically illustrating how PMBOK process groups manifest in a micro-enterprise, the findings reinforce the view that established project management frameworks should be understood as adaptable reference models rather than prescriptive standards. The study thus advances the discussion on the contextualization and selective adoption of project management practices in small and resource-constrained organizations.

From a practical standpoint, the findings suggest that meaningful improvements in project performance can be achieved through the selective and simplified formalization of key practices. The adoption of lightweight tools – such as simplified project charters, basic scope and risk checklists, informal change registers, standardized communication channels, and systematic documentation of lessons learned – can enhance predictability, reduce rework, and support organizational learning without compromising the agility required in residential renovation projects.

This study has limitations that should be acknowledged. The analysis is based on a single case, which restricts the generalizability of the findings, and the use of a dichotomous questionnaire limits the granularity of the assessment. Future research could expand this investigation through multiple-case studies, longitudinal designs, and the use of validated instruments with graduated response scales. Further studies may also examine the relationship between incremental formalization of project management practices and project performance indicators in residential renovation projects, contributing to a more nuanced understanding of how project management can be effectively tailored to micro-enterprises in the construction industry.

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