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## Tailoring: a case study on the application of the seventh principle of PMBOK 7 in a public institution.

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### Summary

In the 7th edition of PMBOK the *Tailoring* process is legitimized as an essential ally in project management, since it makes several adjustments throughout the project's life cycle to provide the best possible environment to achieve the deliverables and the value added to the organization. *Tailoring* as a principle further highlights the unique nature of each project and the need to carry out this process continuously. Based on a unique case study, the beginning of the management functions in a sector of a public organization is discussed, as well as the adaptations made to optimize the workflow and productivity in the deliverables. From this investigation results the proposal of a framework adapted to the needs of the institution, as a starting point for the professionalization of project management.

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## 1. Introduction

As a result of the importance that projects have been acquiring in organizations, the search for improvement in management is increasingly relevant. Analyzing the approaches, methodologies and practices available for use in the context of projects in which it is inserted, constitutes one of the most important initial tasks for the manager, who needs to keep in mind to take advantage of benefits and mitigate weak points [1]. It is important to obtain more theoretical support and broaden the research, in order to support project management professionals facing the most diverse and challenging contexts [2], [3]. Such knowledge sharing will benefit other professionals by providing grounding and security to adopt new practices.

## 2. Literature Review

### 2.1. Design and Project Management

The *Project Management Institute* (PMI) has the most widespread conceptualization of a project: a temporary effort undertaken to create a unique product or service [4], [5]. It is a series of activities and tasks performed with a focus on creating value for an organization or a customer. Fernandes et al. understand projects as open systems dependent on the history and organizational context [6], thus, there must be project managers with the primary function of choosing approaches, methodologies and sets of practices appropriate to the organization, in an integrated way, to build the strategic assets. In other words, it is essential that project management is guaranteed.

Project Management is the application of knowledge, skills, tools, and techniques to organize activities to meet the requirements of a project [4]. It involves planning and controlling all parts of the project. It is a way to manage the work to be done to achieve the objectives, while optimizing the use of resources. In project management, an approach is the highest level of abstraction used to describe how a project will be organized. It involves principles, guidelines, and approaches that define how to carry out all the work required to accomplish the project deliverables.

### 2.2. Development Approaches

The predictive approach requires well-defined scope and fairly determined guidelines, simple, predictable and linear designs, and is founded on meeting three main pillars: scope, time and cost [1]. It works with fixed processes, clear roles and responsibilities, stable, systematic and well-documented planning, and the ability to predict and measure project progress are necessary contexts in many organizational structures, thus factors perceived as benefits of traditional management [7].

The agile approach is conventional in projects involving many uncertainties, since it adapts better to change and divides the work into iterations that allow a frequent refinement cycle. Initial goals are set, and the results of the work are revisited and improved adaptively. Responsibilities are decentralized, teams are more autonomous to manage their activities, and the stakeholders are closer during the project work and in the decision-making stages, following the development and actively giving their opinions [1].

Driven by the constant changes in the business environment and the market, which demands innovations and diversity of increasingly specific solutions, the hybrid approach proposes to combine methodologies and practices, to offer more appropriate ways to manage differentiated projects. These combinations can happen within the context of traditional and adaptive approaches [6], [8] or only within the adaptive approach, mixing the use of different frameworks from this same domain [9].

Any of the approaches mentioned above use compendiums of knowledge in management, in addition to implementing *frameworks*, methods, techniques and best practices for the creation of products or services, some are more aligned to the proposal of this study and are referred to below.

### 2.3. PMBOK e PM<sup>2</sup>

Guide to the Project Management Body of Knowledge – PMBOK is a standardization that identifies conceptualizes

knowledge areas, processes, tools, and techniques up to the 6th edition [4]. As of the 7th edition, released in 2021, there was a break in the usual format of the publication, accompanied by the breaking of some paradigms: the knowledge areas and process groups were suppressed, to make room for the principles and performance domains; the best practices were transferred to a digital compendium called PMI Standard Plus (PMIstandards + <sup>TM</sup>) [5].

The knowledge areas were seen as disciplines, whereas the domains are aspects of attention within projects, however, the Knowledge Areas remain quite relevant in project management, as well as the processes. Thus, versions 6 and 7 of the PMBOK coexist and complement each other according to the needs of the project and the organization. Even the Preface to the 7th edition of the PMBOK makes it clear that: "Nothing in this edition of the Project Management Standard or the Project Management Knowledge Guide negates the alignment with the process-based approach of previous editions. Many organizations and practitioners continue to find this approach useful for guiding their project management resources, aligning methodologies, and assessing resources. This approach remains relevant in the context of this new edition" [5, p. xi].

The PMBOK is authored by the Project Management Institute - PMI or, more precisely, the PMI Standards Committee, PMI's standardization committee. It is a widely recognized and widely used body of project management knowledge [10]–[13].

PM<sup>2</sup> (read "P-M-squared") is a Project Management Methodology, developed by the European Commission, to meet the specific needs, culture and constraints of EU institutions. Its aim is to facilitate the effective management of the full life cycle of a project and to increase the quality of the project management process and project results. It incorporates elements from a wide range of globally accepted project management best practices as well as the operational experience of the European Commission in many projects [14].

The European Commission has published PM<sup>2</sup> as a free and open license for anyone to use for managing their projects, with a focus on projects run in EU institutions or funded by EU programs [6]. Its prescriptive nature and the provision of standard templates to be customized and applied during projects favors its use in management initiatives whose staff is immature and inexperienced.

## 2.4. Tailoring

Tailoring is not a new practice among project management professionals, previous editions of the *PMBOK® Guide* have mentioned the importance of adjusting the project management approach to the unique characteristics of each project and its context. The current Seventh Edition further expands on this concept with a section dedicated to tailoring [5, p. xii], which has been promoted to one of the twelve principles PMBOK 7 refers to for project management [5, p. 21].

Adapting to unique objectives, stakeholders, and the complexity of the environment are factors that contribute to project success [3], [12], [15] because it aims to maximize value, manage constraints, and improve performance by using "right-sized" processes, methods, models, and artifacts to achieve the desired project outcomes [5, p. 44].

Tailoring implies picking and adjusting, conscious of various project factors, without regard to whether the label "tailoring" will be used. It is the deliberate adaptation of the approach, governance, and processes of project management to make them better suited to a given environment and the work to be done. In a project environment, *tailoring* considers the development approach, the processes, the project life cycle, the deliverables, and the people involved [5, p. 131]. The tailoring process follows four steps: (1) select the initial development approach, (2) tailor the organization, (3) tailor the project, and (4) implement continuous process improvements [5, p. 137].

Teams may need to adapt practices to deliver value, so they apply combinations of *frameworks*, one widely adopted type of *tailoring* involves using Scrum and Kanban. While Scrum provides work structuring through roles, events, rules, and artifacts, Kanban assists in visualizing workflow and limiting work in progress, avoids bottlenecks, and highlights impediments more quickly [16, p. 31], [17].

## 2.5. Scrum e Kanban

Key agile practices include Dynamic Systems Development Method (DSDM), Extreme Programming (XP), Agile Unified Process, Feature-Driven Development (FDD), Lean Startup, Scrum and Kanban [8], [12], [17], [18].

Scrum is a widely used *framework* for managing the creation of products and services from an adaptive perspective

[19], [20]. Together with the Kanban method or separately, they are popular forms of development among companies applying agile approaches [17], [21], [22].

The Kanban Method is designated as a holistic *framework* for incremental and evolutionary processes by the Agile Guide, which fosters systems change in organizations [16, p. 104]. In Kanban the backlog (list containing all the work of the project) is managed differently than in Scrum. Scrum uses finite intervals of time called timeboxes or sprints, at the beginning of which a prioritized sprint backlog is filled with project tasks drawn from a project backlog. The tasks in the current sprint's backlog are planned in detail and kept constant during the sprint. Kanban, on the other hand, does not use sprints, but tasks are pulled in a continuous flow from the top of a single prioritized backlog that is maintained by the team regularly during daily meetings. Kanban does not use a locked sprint backlog (time box) which translates into a dynamic backlog that is frequently reorganized during the continuous flow of work. This is considered an advantage of Kanban, which provides more flexibility [17], [23].

### 3. Research Methodology

The main goal of the research was to build and make available, in a reasoned way, a framework with a set of adapted management artifacts and recommendations that can be easily used by a public university institution during its IT project management and control activities.

Thus, the question that guided the study was: How to start the project management function, from the tailoring of approach, processes and artifacts to obtain a flexible and adaptable framework to the organizational context?

To this end, two specific objectives were proposed: (1) Develop a framework to support project management activities to improve operationalization and drive maturity, and (2) Implement tangible artifacts/objects to support management activities and contribute to the choice of approaches, methodologies, and practices to address the tacit/operational challenges of project management.

The research methodologies chosen to develop this study were Design Science Research (DSR) and Case Study, with exploratory character and qualitative approach. Exploratory qualitative research has the intention of obtaining greater familiarity with the context to be investigated and make it more explicit, to improve ideas and consider the most varied aspects of the object or fact studied, therefore it seeks to understand and analyze a specific context [24].

The conduct of this research by the DSR method was based on Vidgen et al. [25] – to ensure rigor and transparency in the creation of the framework – and followed six phases: (1) identify the problem and motivation; (2) define goals and solutions; (3) design and develop; (4) demonstrate; (5) evaluate; and (6) communicate. The Case Study will complement the phases and provide support for the *tailoring* process, as Yin [26] explains that the Unique Case Study can be adopted to capture circumstances, situations, and conditions experienced in the actual context of the organization.

The selection of the single case that is the object of this study arose from the manifestation of the need of the institution's IT Services Department to professionalize the management of the projects carried out, since there were no methodologies or practices applied in this sector until then.

The DSR recommends the execution of the phases in a sequential flow of each step, however, due to the fact that the investigation takes place during a real project, the steps were also adapted and carried out with a more agile bias, and in parallel. At each iteration phases 3, 4, and 5 were executed again, resulting in an increment generated for the set of artifacts in the framework.

### 4. Tailoring Process

#### 4.1. Framework Presentation

Strict application of an existing predictive or adaptive methodology is discouraged by the PMBOK, which indicates that customizations be made to adjust to the organizational context, to select the most useful elements for the project [5, p. 132]. Thus, an empirical and experimental process was started to create the framework - presented in Fig. 1, based on the literature review and on the case study experience, since there were no historical documents of previous projects, nor experiences among collaborators that could be reported in interviews to serve as a reference for adaptations.

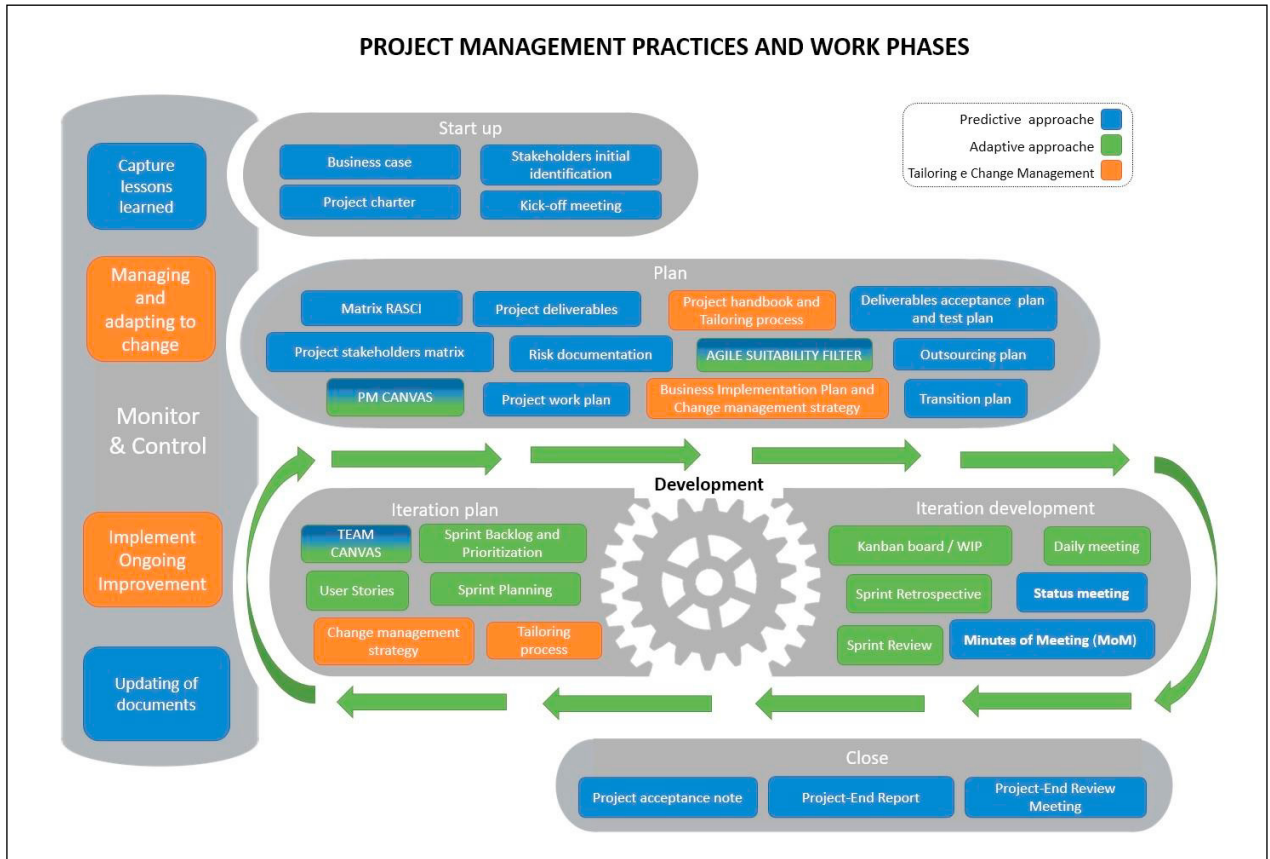


Fig. 1 Working phases of the proposed framework.

The PM methodology<sup>2</sup> has been adapted in the proposed framework to integrate an agile approach and reconcile the need for tighter documentation, coordination and control. The phase structuring adopted by PM<sup>2</sup> uses the name of the dominant activity type in each of the phases, namely: Initiation, Planning, Execution, and Closure. For PM<sup>2</sup> the phases are sequential and do not overlap, therefore the Monitoring and Control part is not seen as a phase, but as a group of activities that crosses the whole project [14].

This framework is more flexible because it is neither totally predictive nor totally agile, it is open to changes and continuous *tailoring*. There is the initial phase and the initial planning phase, however, the execution phase is carried out from iterations, so it has iteration planning and execution subphases, which are repeated to generate increments of the project's products. It maintains the closing phase and the monitoring and control stage continues through all the project phases. The next sections explain the tailoring process carried out to arrive at the framework proposal presented.

#### 4.2. Selecting the development approach

After evaluating the project-specific characteristics related to the cadence and development approach of each expected deliverable, we chose to apply a suitability filter tool to consider some other aspects of the project and combine broader information to the choice of approach and life cycle creation. The evaluation criteria are based on culture, project team and project specific factors, the suitability filter generates a diagnostic visual that can be useful to discuss and decide on the initial approach [5, p. 138], [16, p. 125].

The value of the tool is to promote dialogue about decisive project factors and to gain consensus on the appropriate approach to proceed. It is an aid in high-level diagnosis, and even when the project is already underway but there are

doubts about the assertiveness of the approach that had been chosen, it can be used to assess whether it would be appropriate to make a change of approach or to make adaptations with the inclusion of more practices of some other type of approach, according to the result of the radar chart of the suitability filter, since tailoring is a continuous process during the execution of the entire project [5, p. 144].

In the image of the Fig. 2 it is shown the graph obtained with the application of the tool in the institution in question, with a small group, the project's steering committee, namely the business manager (PO), a representative of the stakeholders (users), the project manager, the systems area coordinator, and the user support area coordinator.

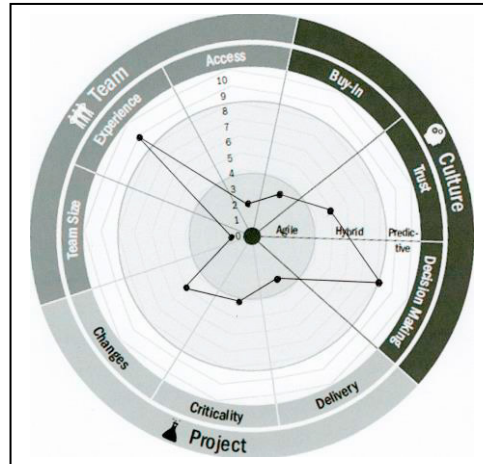


Fig. 2 Radar Graph (Adapted from PMI & Alliance [21, p. 134])

After consensus was reached for the answers to the nine questions in the Appropriateness Filter (see Fig. 2), and the balancing between the suitable practice options discussed among the participants, the Hybrid was confirmed as the approach.

#### 4.3. Tailoring of methods, processes, artifacts and tools

All the adaptations performed in the project are interconnected, the process is not done in isolation, and so the steps complement each other. From the Organization Tailoring perspective [5, p. 139], if there was already some approach or methodology adopted for project management in the institution, the *tailoring* process would assume this starting point. Since the organization does not have a project management policy instituted for all sectors, the prescriptive processes of the PM methodology<sup>2</sup> were used along with the artifacts and templates available, as well as templates from other approaches or created taking into account the needs of the institution and the premise of Simplicity of the agile mindset, i.e. reducing the work that does not need to be done [16, p. 9].

The Kanban method was condensed, only the online visual board was used and the work in progress - WIP - limitation, with only one project task allowed per person, since outside the project scope, the team members performed other activities. After some work packages were completed, the productivity oscillated and it was decided to apply the essence of the Scrum framework, with the work divided into *Sprint* with *timebox*, and the realization of the events.

An important adaptation regarding tools was the use of two canvas for purposes connected to people engagement. It was a resource used for two types of Tailoring: tools and engagement.

The Project Model Canvas was used as a visual tool for a dynamic approach of the team with the project, because it was perceived an initial resistance linked to insecurity in making a project without an external contractor and that would result in a major change. The PMCanvas was then applied so that they could understand well the purpose, the intended benefits, and to develop a sense of belonging to the project, besides helping to better understand the assumptions and risks.

Team Canvas, on the other hand, was used for two situations: (1) initially for team integration, and (2) with the group that underwent the change of method, to realign the work dynamics and routine, and team agreements.

#### 4.4. Tailoring the engagement of the people involved in the project

Adaptations linked to people involvement constitute a very sensitive part of the process, which according to PMI[5, p. 136], includes three perception biases: people, empowerment, and integration.

As far as people are concerned, in public institutions there is less margin for adjustment, since there is a staff and the initial premise is to work with them, temporary hires are not simple. Therefore, the institution's employees who worked on the project took a training course to learn more about the technology with which they would perform their tasks within the project. For the selection of the students who would participate as fellows, we looked for skills related to the agile mentality, such as: commitment, openness to learn autonomously and continuously, as well as the ability to communicate and work well in teams, and some knowledge related to programming logic and systems development, since these qualifications are related to the activities they would perform in the project.

Regarding empowerment, the agile methods used for product development advocate that project members have self-management capabilities and choose how to perform their tasks, however this premise was adapted, due to inexperience in carrying out projects of this nature and immaturity in approaches and methods. Less empowerment was applied with more supervision and direction. This approach was supported by the Agile Guide, which explains that when the majority of the members are inexperienced, consensus-based approaches can lead to problems and rework. Thus, for such teams it may be necessary to "assign" and "direct" additional help until the members have the necessary skills [16, p. 126].

Concerning the integration of the team, this project brought together employees who are part of the institution's permanent staff and temporary grant holders. It is a diverse group with skills aligned to the performance required to achieve the desired results for the project, however, although there is no hierarchy in agile teams, the roles of management, coordination, and supervision were maintained, because they are related to the culture of the institution.

### 5. Discussions about the implementation of the framework during the case study

This section brings the discussions provided through two data collection techniques for validating the proposed framework, such practices are related to stage 5 of the DSR. The project steering committee members, members of the teams that worked on the project and two guests who coordinate other projects in the institution participated in focus group meetings, in which the artifacts and practices that compose the framework were presented and discussed, after sharing their opinions, they also answered a questionnaire prepared with response options oriented by the Likert scale of five points, with metrics to rate the artifacts correlated to the UTAUT Model - Unified Theory of Acceptance and Use of Technology [27].

The artifacts were validated considering the relevance, usefulness, form of availability and use. A set of artifacts presented greater acceptance for the context of the institution, namely: (1) Business Case, (2) Project Opening Statement, (3) PM Canvas, (4) Initial Stakeholder Identification, (5) Team Canvas, (6) Kanban board, (7) RASCI matrix, (8) Requirements document, (9) Stakeholder matrix, (10) Meeting minutes, (11) Record of lessons learned, (12) Final project report. The others were rated as pertinent and useful, but there is disagreement as to whether they are available in physical or digital form and also to the ease of use and the time devoted versus the benefits in creating and updating the documents.

During the focus group discussions there was a consensus that short term, less complex projects should use a reduced set of artifacts depending on their documentation needs.

As for the practices, validation was done based on the perceived importance during their use in the project. Scrum meetings and events, along with change management strategies and the tailoring process were considered important or very important by most participants. The development team highlighted the daily meetings and sprints as practices that brought very positive impact and optimized the pace of deliveries and work dynamics.

Finally, the role of the project manager was pointed out by the committee and by the entire project team as fundamental for it to be possible to implement the proposed framework, to achieve the desired project objectives, and to transform the journey experienced into explicit and tangible knowledge through all the documents produced.

## 6. Conclusions, limitations and future studies

The proposed framework emerged from the single case study about the first project entirely managed and developed with the organization's resources, without external companies being hired, therefore there are characteristics linked to organizational culture, people, and the type of leadership required that directly affect the project management approach and product development, in addition to determining the need for adjustments (tailoring) in the methodology and use of tools and best practices, which justified the creation of a specific framework that would meet the needs and challenges and could be extended to other future projects in the industry. The evaluation process of the framework demonstrated a positive impact for the observed project, and the favorable effect on the team, obtained through the change management and tailoring strategies throughout the entire trajectory.

This study was limited to the observations and experiences of a single institution; however, for future works it is proposed to: (1) apply the framework in a multiple case study in different institutions as a way to seek validation under new perspectives and (2) subdivide the framework by establishing a set of artifacts for simple projects of shorter duration and another for complex projects with longer duration, in order to balance the management efforts with the desired results and deliverables.

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