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Tailoring Project Management Approaches: Lessons Learned by three Public Procurement Projects

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Abstract: Project management (PM) is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. PM approaches must be tailored to fit specific contexts, such as Public Procurement (PP), which involves the purchase of goods and infrastructure by public administrations from private entities. Tailoring can occur on multiple levels; for example, PM approaches can be customized at the organizational level and then again at the project level. The literature acknowledges the importance of tailoring in the context of PP, but there is a gap in the study regarding the levels of tailoring in PP. Given the scarcity of previous studies on the subject, an inductive approach is adopted, based on three action research studies in large PP contexts in northern Italy: the construction of a metro system, the project portfolio of a university, and the creation of a teaching and research center. In these three projects, a work and research team, including the authors, was established. The results were derived from the notes taken by the work and research team. The result is that in PP, a first level of tailoring occurs at the national/European Union level, imposed by the regulatory context, while a second level of tailoring may be present at the organizational or project level. In both cases, the tailoring of Project Management Information Systems (PMIS) is essential to ensure transparency and integrity of the process.

Keywords: Project Management, Tailoring, Project Management Information System, PMIS

1. Introduction

In the field of Project Management (PM), tailoring has emerged as a key aspect for improving efficiency and effectiveness in various sectors, especially in public procurement. Tailoring in PM is the creative process (Pires & Varajão, 2024) that means adapting methodologies, tools, and approaches to meet the specific needs and contexts of individual projects. This paper aims to examine the detailed aspects of tailoring within public procurement, highlighting the importance of such customized approaches.

The origin of tailoring goes back to early studies that emphasized its importance in particular situations. For example, Fitzgerald et al. (2003) showed how Motorola enhanced its software development projects by modifying PM frameworks to meet specific operational needs, establishing a model for strategic PM method adaptation. The need for tailoring arises not just from the unique challenges of different sectors but also from the requirements highlighted by major PM standards (Amaro & Domingues, 2023; Martins et al., 2018; Timinger et al., 2024). Reasons for this customization include optimizing project schedules and quality, reducing costs, fulfilling stakeholder expectations, and increasing the value delivered by human resources (Project Management Institute, 2021; Ribeiro-Lopes et al., 2021). Tailoring is also useful in projects involving industrial plants improvement management (Lo Verso et al., 2015).

In public procurement, the need for tailoring is even more critical. Public entities often hire third parties to execute projects due to convenience or lack of capability, requiring a PM approach that goes beyond standard methods (Zhang & Leiringer, 2023). Managing public projects mainly involves supervising activities done by external parties, presenting unique challenges and complexities. This results in public projects being characterized by a high volume of data and the need for data integration (Pinheiro, 2023). These complexities make a tailored approach essential for efficient and effective project delivery, underscoring the importance of adapting PM practices in public procurement.

The use of Project Management Information Systems (PMIS) is an example of how advanced tools are integrated into tailored PM strategies (Ottaviani et al., 2023). PMIS help manage projects, programs, and portfolios by improving data storage (Piñero Pérez et al., 2022; Piñero Ramírez et al., 2022), scheduling and resource distribution (Mahdi et al., 2022; Pena et al., 2019), monitoring and auditing (Yang et al., 2023; Miterev et al., 2017), risk management (Castelblanco et al., 2024; Ottaviani et al., 2024), and information sharing among stakeholders (Choi & Ha, 2022; Kock et al., 2020; Teslia & Klevanna, 2022). They also facilitate task automation (Ortiz et al., 2020) and the adoption of modern technologies, thus driving digital transformation in organizations and enhancing project outcomes (Jally et al., 2021). Retnowardhani & Suroso (2019) review empirical studies on the effectiveness of PMIS in various geographical and operational contexts, highlighting a general benefit in project performance.

This paper builds on these basic insights and broadens the discussion to the public procurement context, using an

inductive methodology based on Action Research (Greenwood & Levin, 2007).

2. Literature Review

Tailoring is fundamentally defined through two lenses: selecting an existing approach that best fits a particular context or creating a completely new approach to meet unique requirements (Alaydrus et al., 2021). Ciric et al. (2021) discuss this in the context of choosing between broad development strategies like Waterfall or Agile, depending on project-specific factors. On the other hand, the creation of new methodologies, as examined by Ribeiro-Lopes et al. (2021) and Vila Grau & Capuz Rizo, (2023), involves a deeper customization that often incorporates specific software tools, which Timinger et al., (2024) argue is crucial in defining a tailored methodology. The sustainability of such approaches, particularly in smaller projects, is contested due to the high costs associated with developing new methods and tools (Zaheri et al., 2022).

The scientific literature around tailoring also bifurcates into quantitative and qualitative frameworks. Quantitative approaches, such as those proposed by Kononenko & Lutsenko (2019), utilize algorithms and artificial intelligence models to adapt PM approaches based on contextual data. Conversely, qualitative frameworks offer discursive descriptions and identify best practices for tailoring, as outlined by Baschin et al. (2020). These studies collectively treat tailoring as a meta-project that fundamentally redefines the primary project's approach, influenced heavily by the organizational and project-specific contexts (Wilmsen et al., 2019). In PP, the tailoring process is uniquely influenced by external environmental factors and stringent compliance requirements with regulations like transparency and process efficiency (Castelblanco et al., 2022; Rebuglio et al., 2023).

In the context of public administration, digitalization plays a key role (Lima et al., 2023, Geada et al., 2023). Empirical studies demonstrate the difficulty for public administrations in adopting usable software (Chamba-Eras et al., 2017), due to struggles with technical and organizational issues (Santos et al., 2020). The integration of PMIS is often advocated by governments and international bodies to support these requirements (European Commission, 2024; Prebanić & Vukomanović, 2021).

3. Methodology

Given the scarcity of previous studies on the topic, a deductive approach would have proven ineffective (Narayanan & Huemann, 2021). Therefore, we adopted an inductive methodology, drawing upon the results obtained by analyzing and comparing three research cases (Greenwood & Levin, 2007).

The selection of case studies was made from a range of large public building projects in which the authors are involved as experts. The case studies represent three different types of projects: a single project, a megaproject, i.e. a portfolio of closely interconnected projects, and a portfolio of unrelated projects. In all the case studies, a work and research team was established, with the participation of the authors.

The team held regular meetings, collecting material in the form of notes (Narayanan & Huemann, 2021) and documentation of any software prototypes produced. In effect, tailoring emerged as a meta-project where the output is the PM approach of the main project (Rebuglio et al., 2024), an approach considered effective in action research projects involving academics and practitioners (Dallagrave & Santos, 2023; de Gois et al., 2022).

Table 1: Projects outline.

Project	Cost (€)	Description	Kind
A	142 M€	Construction of two segments of the Turin Light Metro	Megaproject
B	160 M€	Construction of the City of Sciences in Grugliasco	Project
C	Over 300 M€	Various construction projects of the Polytechnic University of Turin	Portfolio

The remaining part of the paper is organized as follows: the case studies section presents the three cases analyzed; the results section outlines the findings related to the levels of tailoring and the "what" and "why" of tailoring; the final paragraph draws the conclusions.

4. Case Studies

4.1. Turin Metro (Case [A])

The first case study concerned the construction of the Turin Metro, encompassing two building lots. Initially managed through a traditional contract with stage-based payments, the project required a refined strategy to enhance its monitoring and control phases and improve cost estimation accuracy. This case study explores the tailoring process initiated after the first lot's completion to develop a project management approach suitable for the specific conditions of the project.

Recognizing the complexities inherent in the project, a collaborative team was assembled, comprising four researchers and four staff members from the public commissioning entity. This team was charged with defining a tailored project management approach that aligned with the project's objectives. The tailoring process highlighted

several challenges, particularly in the areas of organization and data collection.

The project's administration involved intricate tasks bound by strict regulatory requirements, such as adhering to Italian law on financial frameworks and contractual obligations regarding the submission and processing of progress reports. These tasks were distributed among various officials, each responsible for specific roles such as reviewing contractor submissions, adjusting financial plans, and managing payment processing.

The strict regulatory environment and the segmented nature of task assignments made traditional process changes challenging. To address these issues, the team proposed the implementation of a PMIS specifically designed to integrate business intelligence capabilities with existing operational processes. This system was tailored to the project's needs, enabling a seamless transition from old practices to a more integrated, data-centric approach.

4.2. City of Science in Grugliasco (Case [B])

The second case study concerned the construction of a research and teaching hub in Grugliasco, utilized a fast-track contracting approach, combining design and execution phases with staged payments upon completion of specific milestones. Early in the project, it was identified that an enhanced structured approach was needed for effective monitoring and control, prompting the involvement of our team to address these challenges.

From the outset, it was clear that the primary challenges revolved around data management. The original contract stipulated the use of a Building Information Modeling (BIM) system by the builder to provide real-time progress updates and document integration. However, the BIM system, while robust in documenting project progress, lacked specific functionalities crucial for detailed monitoring and control akin to those offered by a PMIS.

Given the complexity of the project and the necessity for precise monitoring, payments were contingent upon the successful passing of tests and inspections by independent experts. These critical reports, although stored within the BIM system, were not automatically correlated with the respective sections of the project they pertained to, leading to potential discrepancies and inefficiencies.

To bridge these gaps, we proposed an adaptation to the existing BIM system by integrating 'tags' within the uploaded documents. These tags were designed to facilitate the creation of a bespoke PMIS that would analyze these markers to accurately assess the completion percentages of various project sections. This tailored solution aimed to enhance the BIM's functionality, aligning it more closely with the needs of a PMIS by providing a more granular and automated approach to project monitoring.

The implementation of this tailored solution yielded mixed results. The introduction of tagging required manual input, which increased the complexity of operations for system users and presented challenges in interfacing seamlessly with the existing BIM system. However, these challenges underscored a critical lesson: while a BIM tool provides substantial documentation capabilities, it alone is insufficient for the comprehensive monitoring and control needs of complex projects. Specific PMIS functionalities are essential to support these phases effectively.

4.3. Politecnico di Torino Project Portfolio (Case [C])

The third case study is conducted at the Politecnico di Torino, a public university in Italy, which is involved in developing various educational spaces, including classrooms, research areas, and common facilities. These projects vary in their stages: some are in execution, others in planning, and a few under feasibility assessment. This case study focuses on the tailored PM approach developed to manage this diverse portfolio effectively, emphasizing the strategic monitoring and control of time and costs which are critical for decision-making on future initiatives.

The approach to managing these projects needed to be adaptable and robust to cater to the varying stages of each project within the portfolio. A structured consolidation course was provided for all project managers, enhancing the role of the Project Management Office (PMO), which included two expert PMs. This interactive process not only equipped the PMs with necessary skills but also helped pinpoint specific needs, which was crucial for tailoring the PM approach to the unique requirements of the university's projects.

The PM approach adopted deviated slightly from the traditional waterfall model by integrating standard monitoring tools such as Gantt and tracking-Gantt charts, which are familiar within the PM community. A notable customization involved aligning the Resource Breakdown Structure (ReBS) with the university's accounting chapters. This strategic alignment shifted the focus from traditional site-based resource tracking to a more administration-visible model, tracking outgoing cash flows across various expenditure chapters. This adjustment allowed for a more transparent and communicable management of resources, making it easier for administrative staff to understand and manage project costs in relation to actual progress.

This tailored intervention is still in its experimental phase but has shown promising results. The university's project managers have effectively adopted the new tools, and the PMO has established itself as a critical reference point for both project management and strategic decision-making within the university. The customization of the monitoring and control documents, particularly the ReBS, has facilitated a seamless communication channel between accounting data and project management information, enhancing both transparency and efficiency.

The experience of the Politecnico di Torino demonstrates the value of tailoring project management approaches to fit the specific needs and stages of projects within an educational institution. By customizing tools and processes to better align with institutional practices and the specific characteristics of projects, universities can enhance their project management capabilities, thereby ensuring better control, transparency, and success in their development initiatives. This tailored approach serves as a model for

other educational institutions facing similar challenges in managing diverse project portfolios.

5. Results

5.1. Levels of Tailoring

This chapter aims to show that in public procurement, there is a nuanced view of the tailoring levels, which can be broadly categorized into two: the governmental level and the project level.

The standard we analyzed (Project Management Institute, 2021) defines a two-tier tailoring process: one at the organizational level and one at the project level. In public procurement, we observe two empirical elements that deviate from this framework: The organizational level has a clear macro-division: each entity has a certain autonomy and can tailor its projects accordingly. At the same time, governments harmonize the operations of administrations with specific laws and mandates, imposing a top-down tailoring. This evidence is apparent in all the projects analyzed. On the other hand, the boundary between the customization at the entity level and the project level is "blurred": the public entities we studied tend to manage projects in a rather uniform manner. For example, in the case [C], it involves high-level portfolio management, which consequently shares similar characteristics; in the case [A], it is a type of purpose-built entity, specifically founded for managing public building projects in the transportation sector. In the case [B], it involves a public entitiy with considerable autonomy from its parent entity, customizing according to the laws and its specific needs.

Therefore, we believe that a more suitable framework to describe the tailoring levels in Public Procurement would be:

- Governmental / European Union level. The level of national governments, which impose constraints on project management and the drafting of documents, and provide centralized tools for project management.
- Entity/Project level. The level of the individual project, which may be partially dictated by the specific entity's context.

5.2. Objectives and reasons of tailoring

As already pointed out by the same authors (Rebuglio et al., 2024), tailoring is a compromise between what one wants (or needs) to change and what one wants (or needs) to keep.

Consider any public project. It is subject to certain constraints related to project documents (i.e., artifacts), dictated by regulations or good practices of the field. These constraints may require the production of certain types of artifacts, dictate their authorship, or their order of compilation. As the regulatory context changes, it is likely that officials will need to adapt their way of working. Now consider the opposite context. If certain artifacts are not bound by such constraints, these can change over time, and thus, an official accustomed to reading and producing a certain type of artifact might need to change their habits. At the same time, there are a series of artifacts not tied to external constraints, which can be modified according to the official's will. In the first case, tailoring would be necessary.

This integrated approach, which encompasses how and why tailoring is performed, leads to a deeper understanding of project management's flexibility in public procurement. By exploring the dynamics between people, tools, and artifacts, we can better comprehend how projects can be effectively tailored to meet both regulatory requirements and the specific needs of the project and its management. This understanding not only aligns with current literature but also enhances the practical application of standards in public project management.

6. Discussions and Conclusions

This study delved into the customization of PM approaches within public procurement contexts, through the lens of three major Italian construction projects: the construction of two segments of the Turin Metro, the City of Sciences in Grugliasco, and several building projects at Politecnico di Torino. These projects collectively required adaptations to PM methods to enhance data management, improve transparency, and maintain compliance with strict regulations. In each scenario, the adoption of PMIS proved essential for centralizing and enhancing access to project data, facilitating better communication across various project sectors and aligning resource management with financial flows. The necessity to tailor these systems was evident, as rigid public procurement processes often dictated the PM structure, leading to constraints that made it challenging to modify practices once set, despite potential inefficiencies. This study is limited by the inductive approach: since these designs depend on social and cultural contexts (De Lima et al., 2024), we have no evidence of the generalizability of the results.

Our comparative analysis highlighted that while the legal and contractual rigidity in public projects mandates certain PM procedures, these often necessitate tailoring to meet specific project needs effectively. Customizing tools and integrating advanced software features, such as tagging in BIM systems or aligning Resource Breakdown Structures with financial chapters, showed significant promise in overcoming the inherent inflexibilities of pre-defined PM approaches. The economic considerations of such tailoring underscored the potential benefits of adopting open-source, customizable tools to reduce costs and enhance flexibility. The findings suggest that aligning tool development cycles with PM approach definitions could provide a sustainable model for continuous improvement in project management within the public sector, promoting transparency and operational efficiency.

Expanding upon this, the study also explores tailoring at two distinct levels: the governmental and the project level.

The PMBOK 7's framework mentions organizational and project-level tailoring, but our findings suggest a more nuanced division. Public entities operate with a degree of autonomy, allowing for tailored project management at the entity level, yet they must also adhere to overarching governmental mandates that dictate certain PM practices. This dual-level tailoring is evident in the diverse administrative structures of the entities studied, from high-level portfolio management in regional projects to autonomous operations in sector-specific public enterprises like Turin Metro and localized project management in cases like Grugliasco.

The interaction between these two levels creates a complex landscape where tailoring is not just a matter of project-specific adjustments but also involves navigating between entity autonomy and governmental mandates. This integrated view of tailoring -across government and project levels- further complicates the public procurement sector, making it essential to understand both the 'what' and the "why" of tailoring. It involves not only the choice of tools and artifacts but also the human element, where project managers and officials must adapt to both the constraints imposed by higher authorities and the operational needs of specific projects.

This broader perspective enhances our understanding of PM flexibility in public procurement, aligning with both contemporary literature and practical standards. By examining the dynamics between people, tools, and artifacts within this framework, the study reveals how public projects are uniquely positioned to tailor their PM approaches to achieve greater efficiency and effectiveness, addressing both external regulations and internal project demands.

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