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Topic: Tailoring Project Management Information Systems in Public Construction Projects

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Tutor(s): Prof. Alberto de Marco, Prof Giovanni Zenezini

Main references

- [1] Caniels, M. C. J., & Bakens, R. J. J. M. (2012). The effects of Project Management Information Systems on decision making in a multi-project environment. *International Journal of Project Management*, 30(2)
- [2] Elonen, S., & Arto, K. (2003). Problems in managing internal development projects in multi-project environments. *International Journal of Project Management*
- [3] van Besouw, J., & Bond-Barnard, T. (2021). Smart Project Management Information Systems (SPMIS) for Engineering Projects. *International Journal of Information Systems and Project Management*, 9(1), 78–97.

Highlights of the research activity

Project Management Information Systems (PMIS) are software tools that support project management. There is strong evidence that PMIS are correlated with the quality of project information, and therefore with better project decision making [1,2]. While two decades ago the literature was focused on defining standard data models for PMIS, software vendors developed a wide range of proprietary solutions, often with limited explainability and low interoperability. Today, there is a widespread perception that implementing PMIS in real contexts often means reinventing the wheel, even in relatively standard situations [3].

From this, both theoretical and practical gaps emerge regarding PMIS: is it possible to define common traits in the implementation process of PMIS, as well as in their functional and technical characteristics? This work addresses this question through the lens of tailoring, a concept shared by both project management and computer science. Tailoring refers to the customization of project management approaches and software solutions in order to better fit specific contexts.

This work therefore addresses three main research questions: why to tailor, meaning the conditions that lead to the implementation of a tailored PMIS; how to tailor, meaning the steps required to implement a PMIS in a specific context; and what is a tailored PMIS, meaning its characteristics and common traits when it is deployed in real organizational settings, coexisting with other enterprise software and used, directly or indirectly, by users from different departments.

The study adopts a hybrid methodology, with a deductive component based on the scientific literature and an inductive component based on four significant case studies. These case studies concern the implementation of tailored PMIS in large public construction projects and portfolios.

The results show that PMIS should not be seen as monolithic systems, but as modular and context-dependent instruments. A well-tailored PMIS should no longer be considered a “calculator of the project manager”, but rather a system integrated with the organization and serving the entire organization. Regarding the “why to implement a tailored PMIS”, the findings highlight that the main trigger is the lack of information, especially for monitoring, perceived by top management, combined with the feeling of inefficiency and alienation expressed by project managers. Regarding the process, common traits emerge about which actors to involve and which steps to follow, mainly revolving around reconstructing data flows among project managers and between project managers and the organization. Regarding the definition of a tailored PMIS, the study shows that in complex contexts every PMIS is in fact tailored, and therefore a PMIS is a tailored PMIS. The essential ingredient is the proper integration of PMIS data with other enterprise software and with the data of subcontractors and owners.

The theoretical implications of this work are a better understanding of PMIS, their structure, and their role within organizations. The practical implications are guidelines and concrete examples of how it is possible to implement a tailored PMIS in real and specific contexts.