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# IT Project Portfolio Management Tools – Towards a Maturity Model

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# 1. Introduction & Motivation

## Benefits of PPM and PPM tools

Organizations strive for more efficiency and to gain a competitive edge through IT. **Digital transformation** is driven by a flood of software technologies and encompasses the economic goals to implement new and innovative business models, to increase income generation, productivity and value addition in economy, to improve the regulatory framework and technical standards (Ebert & Henrique, 2018, p.1).

Projects are an effective way to facilitate IT operations in an organization, but the **conduction of multiple projects necessitates an effective management**. Organizations are facing the challenge of investing in the best combination of projects considering their limited resources. In a multi-project setting, this process has its complexities and requires competent systems for support. The application of project portfolio management (PPM), as a method for screening and selecting the right projects in organizations, helps with complexities and strategic priorities and to maximize effectiveness while minimizing costs and risks (Ershadi et al., 2020, p.23). PPM is applied to not only do the projects in the right way (focus of project management), but to do the right projects by building a project portfolio in alignment with the corporate strategy, to drive efficiency and to reduce costs. Evidence suggests a significant and strong correlation between the implementation of PPM processes and a reduction in project related problems with a positive effect on the project performance (De Reyck et al., 2005, p.533).

The *Project Management Institute* (PMI, 2020, p.5) reported that organizations with a **high maturity** in their **project management capabilities** outperform other organizations in key project metrics such as achievement of goals (77% to 56%), to stay within budget (67% vs. 46%), to deliver on time (63% vs. 39%), to stay in scope (30% to 47%), and to achieve a lower project failure rate (11% to 21%).

PPM processes require **robust tools and techniques** to analyze performance data and act as decision support system (DSS). The number of organizations that adopt this approach is steadily on the rise due to its proven benefits in practice (Ershadi et al., 2020, p.24). Advantages include a risk-reward balance in business, the ability to drive better business decisions based on operations, an optimized budget allocation, real-time collaboration between line and functional managers, and appropriate use of available resources (Ershadi et al., 2020, p.23).

A survey for executive leaders identified the **selection of right technologies** to invest in (32%) as the second highest **priority to achieve success in the future**, even before the securing of relevant skills (31%) and only topped by **organizational agility** (35%) (PMI, 2020, p.2).

On average 11.4% of **investments are wasted due to poor project performance**. Organizations that undervalue project management as a strategic competency for driving change report more than 67% of their projects failing outright (PMI, 2020, p.2).

**High failure rates** are especially relevant for **IT projects**. Projects in the field of information and communication technology are becoming even more complicated due to increasing complexities and uncertainties in budget, user requirements, and technology. According to the research of *Johnson* (2018), projects in this field have average budget overruns of around 27%. The success rate of projects in the IT sector is much lower than of projects in other sectors. Major factors include rapid technology

advancements and globalization, which lead to generally shortened life cycles of products and projects (Ayat et al., 2020, p.653).

Project management maturity models are seen by academic and industrial communities as a **solid instrument** to enhance the project management culture **for higher success rates of projects and a more effective organization** (Nenni et al, 2014, p.1). *Tahri & Drissi-Kaitouri* (2015, p.172) state different maturity model define maturity differently.

Despite the **benefits provided by PPM tools** and a **growing interest in the academic community**, with approximately 17.200 search results of published articles to relating topics over the last two years, high impact of project failures, and the perceived importance of technology selection, **not a single maturity model was found in the academic literature that assesses the maturity of PPM tools**.

Research that **collects available knowledge** and discusses how **maturity could be measured for PPM tools** could **provide beneficial insight** to the academic community to further develop the discipline. When the concept of maturity has been defined and implemented in a logical structural design, maturity models are **suitable instruments to assess the degree of implementation of complex concepts**. They can be utilized to raise awareness for potential development within organizations and may also provide **guidance for action plans** and allow organizations to actively monitor their progress (Silvius & Schipper, 2015, p.17).

To investigate this **research gap** and find out more about the requirements that such a maturity model would need to fulfil, this thesis aims to provide the first steps towards a **scientifically documented maturity model for PPM tools** and to fill this gap in academic research. Research in **information systems** follows the objective to acquire knowledge and understanding that **enables** the development and **implementation of technology-based solutions** to unsolved and **important business problems** (Hevner et al., 2004, p.84). The selection of technology, as well as the management of projects and portfolios has been identified as an important business problem and the construction of a maturity model could be a suitable instrument to provide benefits for researchers and potential users.

The author conducted **literature research, market research**, and spoke to over a dozen **PPM experts** in the consulting industry over the course of **23 interviews**. The experts provided acquired insights that they gained in years of experience in consulting, implementing, and enabling PPM in a variety of industry. Each interview has been transcribed, summarized, and analyzed. The results of all three research methods have been collected and discussed resulting in the design of a maturity model for PPM tools.

The design process has been conducted with acknowledgement of previous progress in the academic **design science research (DSR)** domain. All decisions of the design process and the received feedback by experts to further refine the model have been documented in detail. The designed model aims to provide benefits for researchers and practitioners and shows a lot of potential for further design iterations.

**DSR** has been the subject of growing attention in the IS community and is a **firmly established research method**, while still being at the maturation stage (Prat et al., 2014, p.2). DSR research typically results in artifacts that are generally described as innovations which define ideas, practices, technical capabilities, and products through which analysis, design, implementation, and use of information systems can be effectively and efficiently accomplished (Hevner et al., 2004, p.83).

DSR is conducted at **three levels**. The conceptual level, the descriptive level, and the prescriptive level resulting in different types of knowledge (Sonnenberg & vom Brocke, 2012, p.382).

Maturity models are one type of IT artifact that can be the result of the research process with the aim to solve a specific problem and act on the descriptive and prescriptive level of IT artifacts. According to *Hevner et al. (2004)* a problem can be defined as the differences between a goal state and the current state of a system. Problem solving can be defined as a search process using actions to reduce or eliminate the differences (*Hevner et al., 2004, p.85*).

With different **definitions of maturity** in the context of information systems and a **high relevance of PPM tools**, a maturity model could aid potential users to widen their awareness of important aspects for an adequate PPM tool selection and implementation. The maturity model should provide logical structures to enable users to evaluate the status-quo of utilized IT PPM tools in their organization, to reveal potential for further tool utilization, and to identify required processes that have to be established before a fitting tool with appropriate functionalities and properties can be effectively adopted. The scientifically documented maturity model design process and gathered research from academic literature, market research, and practical expert knowledge should help researchers further develop the research domain of PPM tools. This thesis aims to provide an overview on the topic from different perspectives.

The identified research gap that **no scientifically documented maturity model for IT PPM tools could be found in the academic literature**, lead to the formulation of the research objective. The scope and objective of this research is to build a maturity model for PPM tools following a DSR development approach with detailed documentation of the influencing material and decisions made in the design process. To gather the necessary information in a structured manner, the following research questions have been formulated.

#### **Research questions:**

- 1. What are requirements and critical success factors for a maturity model for IT PPM tools?*
- 2. What represents maturity for IT PPM tools in terms of measurable parameters?*
- 3. How should a maturity model for IT PPM tools be structured for applicability?*

In order to answer these questions, the thesis first discusses the meaning of IT project portfolio management tools and maturity models to provide theoretical background and establishes a common understanding of the topic. Different research designs and methodologies are discussed and the chosen development approach for the creation of the maturity model has been described, the identification process of relevant literature, market research, and the process for the search, conduction, analyzation of expert interviews, and their application to gather knowledge and evaluate the maturity model are presented. Relevant requirements, critical success factors, and parameters for the maturity model have been identified through all three research methods, as well as additional information on PPM tools and relating processes. Currently available maturity models of the domain and adjacent areas that relevant structural design ideas for the maturity model are presented, with a selection of available market research on the topic, and a structured documentation of the expertise provided through the interview process. *Chapter 5* details the decisions made in the development process for the first iteration of the maturity model for PPM tools. After completion of the first iteration, the maturity model is presented and further evaluated through additional expert interviews. A discussion of the most important aspects follows, as well as a description of the limitations and identification of potential for further research. The thesis ends with concluding remarks on the results and research contributions.

## 9. Conclusion

This thesis fills the **knowledge gap** of available academic research on maturity models for PPM tools and collects relevant maturity models in literature, relevant market research on IT PPM tools, with additional knowledge gathered through expert interviews and the explication of their experiences in the domain. The selection and evaluation of a fitting development approach that acknowledges past contributions and serves for the creation of a maturity model for PPM and the evaluation thereof, also serves as a contribution of this research.

While the presented maturity model is the primary artifact, the vast amount of collected research on the topic of IT PPM Tool maturity is new to the academic field and should provide a lot of potential for further takes and refinement of maturity models for PPM tools.

This research presents the first steps and lays the groundwork towards a maturity model for IT PPM tools.