



TOWARD A PROJECT PORTFOLIO MANAGEMENT EVALUATION FRAMEWORK

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Abstract

As projects constitute a major part of organizational budgets and strategic development, practitioners become dependent on project portfolio management (PPM). However, the existing knowledge on how to evaluate and improve PPM is rather fragmented and lacks empirical grounding. We ask: How can we develop a holistic and empirically validated PPM evaluation framework? Drawing on evaluation theory, we structure contributions from 20 PPM publications into a framework with four evaluation areas. Together with a large company, we develop, apply, and refine the framework. As a result, we offer two contributions: (1) a theory-ingrained artifact that structures a fragmented body of knowledge into four related PPM evaluation areas, and (2) a demonstration of how a theory-ingrained evaluation artifact can serve as an evaluation framework that helps practitioners identify strengths and improvement potential in PPM. In conclusion, we discuss how our results may inform future research and help organizations evaluate PPM.

Keywords: Project portfolio management, Evaluation, Action design research

1 Introduction

As Western societies increasingly get projectified (Jensen et al., 2016), organizations experience ongoing challenges in managing their project portfolios, since projects constitute a major part of the organizational budgets and strategic development (Schoper et al., 2018). Recent research defines Project Portfolio Management (PPM) as the overall organizational ability to manage project portfolios strategically and holistically to support the success of the organization (Clegg et al.,

2018). However, our review of the literature finds that there is a lack of frameworks enabling us to evaluate how well the PPM arrangements of contemporary organizations support this endeavor.

PPM research has a long tradition. Early publications from the 1950s and 1960s start out by applying a narrow focus to the project selection processes (Baker and Pound, 1964, Rosen, 1956). Gradually, the scope expands to also include the processes before and after project selection (Archer and Ghasemzadeh, 1999). After the turn of the millennium, PPM research began to shed light on a wider range of problem areas (Elonen and Arto, 2003). Especially, issues regarding lack of resources compared to the amount of ideas seem to be a focal point for high-cited contributions (Engwall and Jerbrant, 2003, Cooper et al., 2000). In the same era, a stream of research adopted the maturity concept from the fast evolving field of software development (Paulk et al., 1993). Soon thereafter, maturity assessments became central to the way PPM organizations evaluate PPM in the years to come. In that regard, a rich variety of maturity models was developed by PPM researchers (Reyck et al., 2005, Jeffery and Leliveld, 2004, Andersen and Jessen, 2003).

Maturity models are found useful because they allow individuals and organizations to evaluate the maturity of various aspects of their procedures against benchmarks and to prioritize improvement actions (Nikkhou et al., 2016). Here, maturity is understood as a state where the organization is in a perfect condition to achieve its objectives (Andersen and Jessen, 2003). Maturity is mostly described in stages, e.g. (0) Ad hoc, (1) Initial, (2) Repeatable, (3) Defined, (4) Managed and optimized (Paulk et al., 1993). Research provides some empirical support for a connection between the concept of PPM maturity and positive organizational effects (Jeffery and Leliveld, 2004, Reyck et al., 2005), but no clear causation that can be statistically generalized (Hansen and Kræmmergaard, 2014).

Furthermore, scholars argue that PPM maturity models have drawbacks (Nikkhou et al., 2016). One substantial criticism is the implicit and dubious notion that one universal and static maturity model fits all organizational settings across time and space (Drazin and Van de Ven, 1985). This argument seems important, as many of these maturity models were developed more than a decade ago. This inspires scholars to consider the generic question: What is the core PPM process leading to organizational success (Padovani and Carvalho, 2016)? Patanakul (2015) forcefully asks: How do we know that our PPM arrangement supports organizational success? He suggests the concept of PPM *effectiveness*, which spans over evaluating the classical operational attribute of PPM *efficiency* (Martinsuo and Lehtonen, 2007), but also includes a broader evaluation of the ability of PPM to obtain strategic goals (Patanakul, 2015). Related, but still distinct, recent scholars put forward the concept of *effectuation* which enables us to evaluate organizations' ability to use available resources and to foster partnerships and useful networks (Nguyen et al., 2018). Overall, we see a development in the concepts used to evaluate PPM moving toward a broader understanding of value (Laursen and Svejvig, 2016); this includes new evaluation criteria such as sustainability (Martinsuo and Killen, 2014, Schipper and Silvius, 2018) and preparedness for the future (Rank et al., 2015).

Despite the importance of previous contributions, we find that the literature on PPM evaluation is rather fragmented and has no integrated and empirically tested framework enabling us to evaluate PPM in contemporary organizations. On this backdrop, we formulate the research question: *How can we develop a holistic and empirically validated PPM evaluation framework?*

We structure our response to the research question as follows. In the next section we present the theoretical background, followed by the methodology section. Fourth, we present the developed PPM evaluation framework, and in the fifth section we show how the evaluation framework can

be applied in a real-life organization. Sixth, we summarize key learning and reflection points, before we finalize the article with a discussion of the practical and theoretical contributions of the developed artifact.

2 Theoretical background

To understand the construct of evaluation, we start this section by discussing its origin and later development. Finally, we suggest four approaches to PPM evaluation which we utilize to organize our review of literature on PPM evaluation.

Evaluation

Evaluation is the “*action of appraising or valuing*” [something] (Oxford English Dictionary). Following Rode and Svejvig (2018b), evaluation can be conceived of as an integral part of our basic human cognitive processes and a natural element in our everyday life.

Although there are documented evaluations of human interventions dating back to 2200 B.C. (Shadish et al., 1991), the issue of program evaluation became especially important in the USA in the 1960s (Chen, 2015), when Kennedy’s and Johnson’s administrations invested heavily in social programs (Linzalone and Schiuma, 2015). Today, some talk about the evaluation society (Dahler-Larsen, 2013) and consider evaluation a profession with a community of evaluators (Stufflebeam and Coryn, 2014). Within this community, the evaluated object is a program. We are aware of the distinction between project, program, and portfolio within the project management domain, but according to Dahler-Larsen (2013), “*program evaluation is “just” evaluation*” – and therefore this stream of research is considered relevant for PPM evaluation.

Within this stream of evaluation research, there is no one agreed-upon definition of evaluation – but a broad range of evaluation paradigms, classifications, typologies, and models (Dahler-Larsen, 2013, Mertens and Wilson, 2012, Linzalone and Schiuma, 2015). For instance, recent research has identified more than 50 evaluation models and 20 evaluation typologies (Linzalone and Schiuma, 2015). Dahler-Larsen (2013) presents a collection of 10 evaluation definitions – conceptualizing evaluation as a process of systematic assessment, examination, investigation, and determination. Based on this list, he describes how the definition of evaluation has developed over time – from a method-centered approach in the early 1980s to an approach where context and conditions are more central.

One of the earliest evaluation classifications was made by Scriven (1967 in Chen, 2015) who distinguished between formative and summative evaluations. The goal of formative evaluation is to improve, while the goal of summative evaluation is to merit. Consequently, formative evaluations are done early, whereas summative evaluations are done later in a program’s life cycle. Scriven (1991 p 19 in Chen, 2015 p 8) explains the distinction by referring to a cook: “*When the cook tastes the soup, that’s formative evaluation; when the guests taste it, that’s summative evaluation*” (Scriven, 1991 p 19 in Chen, 2015 p 8). Later, Chen (2015) develops Scriven’s (1991) dichotomy and proposes a matrix based on two distinctions: the evaluation’s function and the stages of a program. He describes four distinct evaluation types and advocates for a hybrid of two or more of these evaluation types. Hybrid evaluations are recommendable because they shed light on different aspects and serve multiple purposes.

On this backdrop, Rode and Svejvig (2018a) present a multidimensional approach to project evaluation consisting of four approaches: process, benchmarking, outcome, and learning. In this framework, projects are the *evaluand*: the unit of analysis (Dahler-Larsen, 2013). As this

framework draws on general evaluation theory, we do however expect the four approaches to be generic to such an extent that they can apply to different levels of analysis – beyond the meso project level and including the macro PPM level (Geraldi and Söderlund, 2018). To test this assumption, we structure the following review of PPM literature on evaluation around these four approaches and develop a PPM evaluation framework that we instantiate in a real-life organization.

PPM evaluation

Following Rode and Svejvig (2018a), we structure the following discussion of PPM literature on evaluation around the four evaluation approaches: process, outcome, benchmarking, and learning. By drawing on references from an unstructured review of the PPM literature, we utilize the four approaches to structure a historical account of how the PPM field of research has developed and progressed throughout the years.

The first approach – PPM *process* evaluation – has a long and rich tradition (e.g. Rubenstein, 1957). The early literature focused primarily on the selection process (e.g. Rosen, 1956, Hitchcock, 1963). Later, the earlier aforementioned seminal paper by Archer and Ghasemzadeh (1999) integrated the existing techniques and tools from the literature in a coherent framework, enabling organizations to evaluate a broad repertoire of their PPM selection processes. After the turn of the millennium, scholars introduced the concept of maturity as a quantified measure for evaluating PPM processes (e.g. Reyck et al., 2005, Jeffery and Leliveld, 2004, Pennypacker, 2005).

This leads to our next approach in PPM evaluation, as the concepts of maturity enable organizations to *benchmark* their portfolio processes against internal and external organizational entities. As the standards in project management also put a large effort into this development, the level of sophistication in PPM benchmark models increases (e.g. OGC, 2006, PMI, 2013).

Whereas the maturity models are well suited for benchmarking of PPM processes, they have less focus on benchmarking the results of the portfolio. Recent research points in a promising direction, namely toward inclusion of an *outcome* perspective as well. Examples are concepts of PPM effectiveness (Patanakul, 2015) and PPM effectuation (Nguyen et al., 2018), which transcend the traditional focus on efficiency and emphasize the consequences of PPM.

In parallel, recent research has begun to explore how evaluations can emphasize *learning*. In that regard, Stettina and Hörz (2015) discuss the concept of continued improvement by repeating PPM routines, and scholars such as Sweetman and Conboy (2018) discuss how portfolio management may be adopted based on feedback and learning.

On the backdrop of our discussion of the PPM evaluation literature, we find several contributions that advance PPM evaluation. However, we find no integrated and empirically validated PPM evaluation model embracing all four approaches – but a rather fragmented literature on PPM evaluation and no knowledge on how PPM evaluation is conducted in its organizational context.

3 Research methodology

This paper adopts the Action Design Research (ADR) approach as described by Sein et al. (2011a) and utilized by Rode and Svejvig (2018b) to develop and demonstrate a project evaluation framework. ADR has elements of action research (intervention) and design research (artifact building) (Goldkuhl, 2012). ADR is a research method for generating prescriptive design knowledge by building and evaluating (intervening) an artifact in its organizational setting. ADR consists of four interleaved stages: (1) problem formulation, (2) building, intervention, and evaluation, (3) reflection and learning, and (4) formalization of learning (Sein et al., 2011b). To each stage there are one or more guiding principles, as shown in table 1.

Table 1: ADR methodology

Stages	Principles
Stage 1: Problem formulation	Principle 1: Practice-inspired research Principle 2: Theory-ingrained artifact
Stage 2: Building, intervention, and evaluation	Principle 3: Reciprocal shaping Principle 4: Mutually influential roles Principle 5: Authentic and concurrent evaluation
Stage 3: Reflection and learning	Principle 6: Guided emergence
Stage 4: Formalization of learning	Principle 7: Generalized outcomes

Stage 1: Problem formulation

Following the first principle of practice-inspired research, we aim to solve field problems *per se* by generating knowledge that can be applied to the class of problems specified by the specific problem (Sein et al., 2011b). In that regard, we engaged in a one-day workshop focusing on agile project portfolio management. It was held in November 2018 and involved participants from five international companies. The purpose of the workshop was to identify the main challenges facing the participating organizations. We used these challenges to guide our problem formulation, and we thus let practice inspire our research following the first principle of stage 1. In specific, one of our key findings of this workshop was that the organizations had little common ground for evaluating their PPM. This practical finding inspired a research process leading to the design of a PPM evaluation framework.

Following the second principle of developing a theory-ingrained artifact (Sein et al., 2011b), we used theory to inform the design of the evaluation artifact. Here, we understand theory to be systems of statements allowing generalization and abstraction (Gregor, 2006). By adapting the project evaluation framework proposed by Rode and Svejvig (2018a), we developed the first version of our PPM evaluation artifact. To leverage the building process (Sein et al., 2011a) we

utilized general evaluation theory (Dahler-Larsen, 2013, Chen, 2015, Mertens and Wilson, 2012) and an unstructured review of the literature on PPM. The latter includes publications from recognized international peer-reviewed journals on project management-related issues as well as practitioner-orientated literature developed by the two large project management standards: OGC (OGC, 2006) and PMI (PMI, 2008). The key point of each publication was translated from an abstract level into a concrete evaluation criterion and then operationalized into questions – understandable to managers in the domain of practice.

The outcome of this first stage was the initial design of the PPM evaluation artifact – presented in section four.

Stage 2: Building, intervention, and evaluation

Following the second stage of building, intervention, and evaluation, in December 2018 we tested the initial artifact in one of the participating organizations – hereafter called Alfa. One of the co-authors works as a PPM expert and manager in Alfa. We tested the artifact by using it as an interview guide in two highly structured interviews regarding PPM in Alfa. The interviews were recorded and lasted one hour each. In one way, the interviews had a deductive nature, taking as their point of departure the theory-ingrained artifact. On the other hand, the interviews took an abductive turn, as the interviewer and interviewee adapted the questions along the way to fit the practice domain. In this way, the two interviews fostered mutually influential iterations between the two domains: the theory-ingrained artifact and the organizational context (Sein et al., 2011a).

The process facilitated mutual learning and reflection in and among the participants (interviewer and interviewee) working through the questions and implementing improvements during and after each interview. In this way, decisions about designing, shaping, and re-shaping the artifact were woven into the evaluation process. In that regard, our research process follows the principles of

stage 2: (3) reciprocal shaping, (4) mutually influential roles, and (5) authentic and concurrent evaluation (Sein et al., 2011b).

The outcome of this second stage was the instantiation of the realized design of the PPM evaluation artifact – shown in section five.

Stage 3: Reflection and learning

In the third stage of reflection and learning, we re-considered the findings from the stage of developing and deploying the theory-ingrained artifact (Sein et al., 2011a) in Alfa. Like Giessmann and Legner (2016), we consulted all our material – including the minutes from the first meetings, slides from the one-day workshop, as well as recordings and notes from the two interviews – summarized in the appendix. Following the sixth principle of guided emergence, we discussed our findings in the research team and summarized them in four reflection and learning points that can refine the PPM artifact and eventually guide the emergence of a set of preliminary design principles (Sein et al., 2011a) for PPM evaluation.

The current outcome of this third stage is a set of learning and reflection points for PPM evaluation – shown in section six.

Stage 4: Formalization of learning

In the fourth and final stage of formalization of learning, we will formalize our learning by generalizing the outcomes of the prior stages. Before we do that, we plan to re-intervene in practice and evaluate the use of the artifact in other organizational contexts. This will help us understand the utility of the PPM evaluation framework in a broader sense and to generalize the specific artifact as a solution to a broader class of problems (Sein et al., 2011b) – in this case, PPM evaluation. Confronting the framework with other real-life settings will provide instant feedback on its design

features (Mathiassen, 2002) and allow us to further evaluate the robustness of the artifact. Thus, we plan to follow the seventh principle and develop a set of refined design principles for how PPM evaluation can be organized to improve the quality of PPM.

The outcome of this fourth stage will be a refined set of general design principles that can guide PPM evaluation and improve PPM performance.

4 Developing a PPM evaluation framework

In this section, we present the developed PPM evaluation framework.

We adapt the project evaluation framework proposed by Rode and Svejvig (2018a), as shown in below figure 1 to structure our review of the PPM literature.

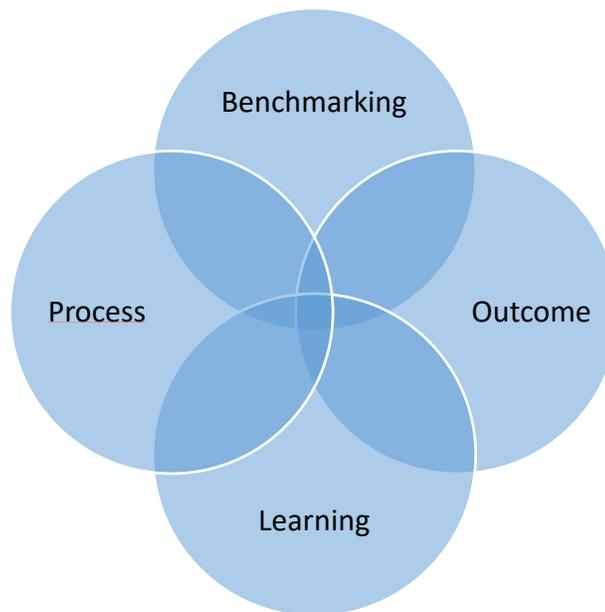


Figure 1: Project evaluation framework

After the PPM literature has been structured in the project evaluation framework, as shown in the second column of table 2, the key point of each publication is translated into a concrete evaluation criterion and then operationalized into a question shown in the third column to the right.

Table 2: Four approaches, 20 publications and 20 questions

Approaches	Publications	Questions
Process	Six PPM publications on process	Q1. Use of (traditional) PPM processes and techniques Q2. How integrated are PPM processes Q3. How formalized are PPM processes and practices Q4. How tailored is the PPM design Q5. PMO roles of coordinating, controlling, and supporting Q6. Management quality, allocation quality, and cooperation quality in PPM
Bench-marking	Four PPM publications on benchmarking	Q7. Use of maturity assessment Q8. Assessment of PPM governance Q9. External or internal comparison of the project portfolio balance Q10. Data on project portfolio costs in internal and external benchmarking
Outcome	Five PPM publications on outcome	Q11. Effectiveness of strategic attributes Q12. Effectiveness of operational attributes Q13. Measure value creation at portfolio level Q14. Sustainability included in PPM Q15. To what extent is the logic of effectuation used in PPM
Learning	Five PPM publications on learning	Q16. Use of learning loops Q17. Responsiveness and flexibility in PPM Q18. Frequency of face-to-face interaction in PPM Q19. Formative role of projects Q20. Use scaling learning from project level to portfolio level

Table 2 is based on recognized international peer-reviewed journals on project management-related issues as well as practitioner-oriented literature developed by the two large project management standards: OGC (OGC, 2006) and PMI (PMI, 2008).

The PPM evaluation framework consists of 20 double questions. The first part of each question asks to what degree the organization follows the evaluation criteria – to assess the real state of

affairs. The second part asks how important the proposed concept is to the organization – to assess the ideal state of affairs.

5 Using the PPM evaluation framework

In this section, we present an instantiation of the PPM evaluation framework illustrating how it is used to evaluate PPM in one organizational context – namely Alfa – which is described in the first sub-section.

Empirical setting

The case company, here anonymized as Alfa, is a large European manufacturer of fast-moving consumer goods. Alfa has a global project portfolio with a traditional project management setup utilizing a Stage-Gate model to structure its project process. However, the setup is currently undergoing structural modifications at both portfolio and project management levels to enable faster response to change. At project management level, modifications include the introduction of an agile project approach in addition to the traditional plan-based approach – both to be conducted within the frame of a global Stage-Gate project model that remains in place. At portfolio level, the yearly portfolio process is replaced with a more rapid monthly process, and governance of project moves from one, global process for all projects toward a centralized mandate on large, strategic projects and local mandates and prioritization on small and medium-sized projects. Global transparency through local tracking of key metrics on all projects remains. The instantiation below is based on the current state of PPM in Alfa.

Instantiation results

The scores from the evaluation are summarized in the below figure 2. The “uninterrupted” line shows the score of “to what extent” the organization is in line with the 20 publications’ concepts

represented by the 20 questions – the real state of affairs. The dotted line shows the “relative importance” of the proposed concept to the organization – the ideal state of affairs. Overall, the results shown in the figure indicate that most of the suggested questions are very important to the organization. Furthermore, the results indicate that there is room for improvement, as there are many areas where the organization is not in line with the proposed concept – despite the fact that the concept is important to the organization. In the following, we discuss the empirical findings from each of the four areas of evaluation.

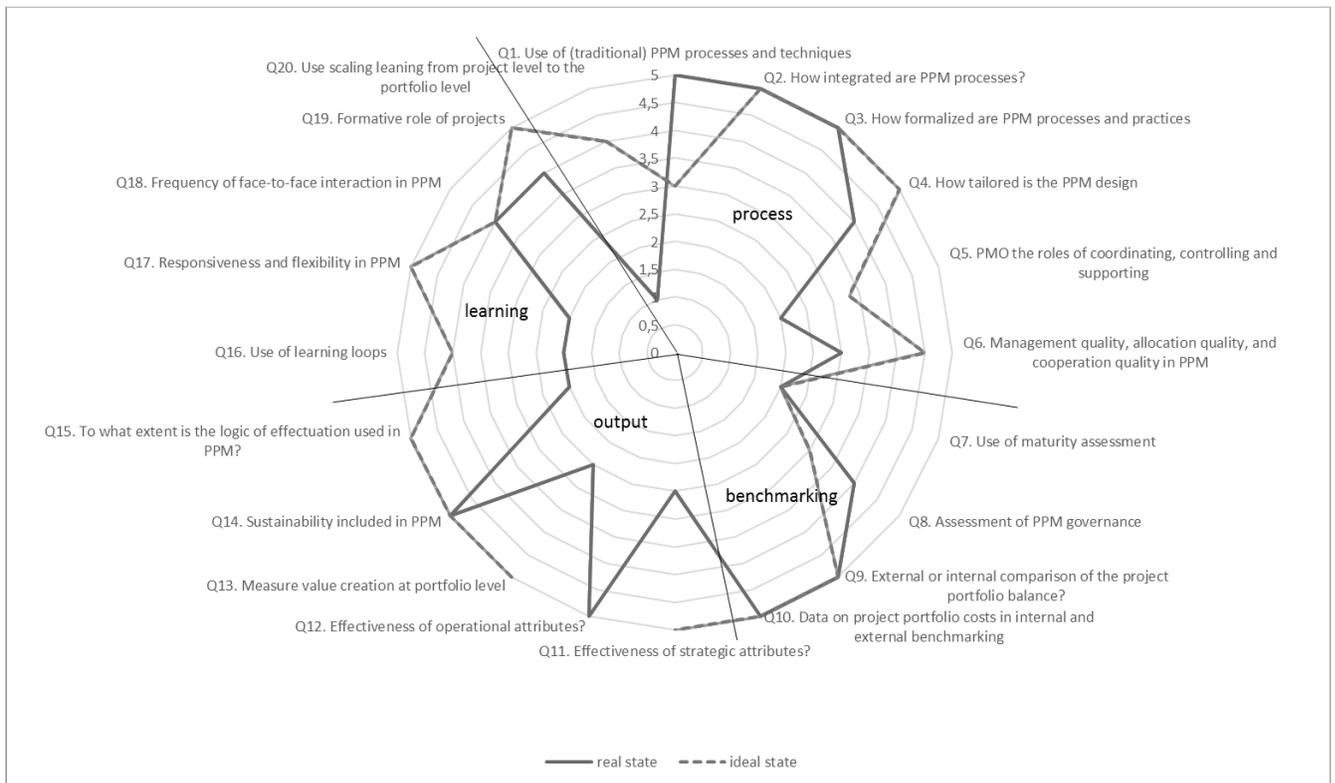


Figure 2: Instantiation of PPM evaluation framework

Process

The PPM process is covered in questions Q1-Q6. Interestingly, use of traditional PPM processes and techniques was the only place where the organization followed the prescriptions of the concepts

to a very high degree, though these concepts were scored as less important to the organization. A bit simplified, one could say that the organization over-performed in this area. One key reason is the organization's current focus on changing its plan-based PPM processes and techniques. In the nearby future, new and agile-inspired processes will be implemented. The PMO is a key actor in the structural modifications at portfolio and project management levels, who draws vastly on their resources. Thus, the PMO mostly focus on controlling the portfolio and currently down-prioritizes other roles, e.g. the supporting and coordinating roles in the organization.

Being in this state of introducing an agile alternative to traditional approaches explains the paradox that in some regards the organization is described as very mature, and in other regards it is described as very immature. This finding somewhat contrasts the findings of earlier research, where maturity and PPM processes tend to cluster and go together (Jeffery and Leliveld, 2004, Reyck et al., 2005).

Credit must be given to Alfa for allowing self-critical and authentic evaluation of its PPM. They admit that many "on-the-surface-mature" PPM processes do not reflect the organizational reality. For example, the organization has advanced dashboards with various traffic lights showing the KPI status of projects and a detailed human resource management plan – which does not represent the actual state of affairs.

The organization's way of thinking about its PPM processes led to some interesting discussions about how some of the concepts in the evaluation framework should be interpreted. One illustrative example was our question about the degree of formalization, where the manager explained that Alfa has a fine-grained notion of *what* should be formalized. Alfa wants specific things to be more formalized, e.g. the vision of the projects, the availability of resources, the allocated budget. On the other hand, Alfa intends to become less formalized with regard to how and when the projects in the portfolio provide value.

Benchmark

Benchmark is covered in questions Q7-Q10, and there is high alignment between the real and ideal states in these results. Furthermore, in the light of the above discussion, it is not surprising that Alfa finds traditional maturity assessment of PPM processes such as P3M3 (OGC, 2006) and OPM3 (PMI, 2008) less important. Instead, Alfa looks for models which originate from the so-called agile mindset, e.g. SAFe (Leffingwell, 2007) and Scrum (Schwaber and Sutherland, 2011), but also models by Gartner have been considered. Furthermore, Alfa has an urgent need for benchmarking its PPM governance structures, but has not found any suitable frameworks. Therefore, Alfa organized the aforementioned workshop on agile PPM governance with four other organizations.

Whereas Alfa needs tools and practices for benchmarking PPM processes and governance, it has much experience and strong capabilities in external and internal comparison of project portfolio costs (Verhoef, 2002, Verhoef, 2005), the balance of its assets (Weill and Aral, 2006) and the balance of its strategic buckets (Chao and Kavadias, 2008). The manager explained that Alfa has many practices for supporting portfolio balancing, as this has direct and instant impact on the project selection process. Alfa's position in a highly competitive global market demands constant focus on how its development resources – materialized in projects – are distributed and balanced across its strategic goals.

The manager brought up an important type of benchmarking not mentioned in our framework, namely benchmarking of value provided by projects. Alfa was described as being advanced in its practices for defining project costs and benefits. This is done in the “project initiation” processes by utilizing a standardized format for project business cases. However, the organization lacks tracking of benefits after project completion, and the following section discusses this issue in further detail.

Output

Output is covered in questions Q11-Q15. Effectiveness of strategic attributes involves strategic alignment, adaptability, and delivering the expected value (Patanakul, 2015). The manager gave the highest score to effectiveness in the planning process and explained the rigorous processes in the planning process, with high transparency in decision-making around business case approval and project tracking on key metrics. The project organization was described as having strong capabilities in delivering transparency in terms of schedule, cost, and quality. However, the manager emphasized the lack when it comes to measuring realized value: “*Our intentions are clear ... but what do we get in the end?*”. The manager explained that this high transparency in schedule, cost, and quality is becoming relatively less important compared to the question of how Alfa gets the most value out of its projects. Our discussions on value seemed highly relevant to Alfa, and value could not be reduced to commercial issues. Instead, the concept of sustainability encapsulated a deeply embedded and highly prioritized value in PPM as sustainable, environmental, social, health, and safety values. For example, Alfa invests in becoming sustainable and CO2 neutral. Furthermore, the company has made long-term investments in the development of sustainable materials.

Whereas the concept of effectiveness seems to capture the current focus areas in PPM, the concept of effectuation seemed to point in the direction for which the organization is aiming in a longer time horizon. The organization was said to have large development potential by conforming to the principles defined in effectuation. In particular, effectuation suggests more emphasis on using available resources rather than following pre-defined goals to shape projects (Nguyen et al., 2018). However, the manager explained some current tendencies supporting this direction; the organization is decentralizing its resource allocation to more autonomous units and stable teams.

These teams “pull” work assignments to a work backlog, and the manager emphasized that the logic of effectuation is a key driver in this current development of PPM. Toward the end of our discussions on outcome evaluation, the manager forcefully asked if/how adaptability can be measured. As Alfa is a player in a global innovation economy, this environment provides many “unknown-unknowns” (Teece et al., 2016). This challenges or at least requires it to expand its traditional PPM practices and principles, and the next section will look into this discussion.

Learning

Learning is covered in questions Q16-Q20. As illustrated by the spider’s web in figure 2, there is a significant gap between the high priority Alfa gives to the concepts in this area and the current practices in the organization. During the interviews, the manager easily provided concrete examples of how the suggested concepts already are or were intended to be utilized. Namely, the manager saw the potential of implementing more organizational routines as learning loops, as suggested by agile PPM (Stettina and Hörz, 2015). Similarly, the manager saw a potential in using scaling learning from project retrospectives (Agile team learning/reflection meetings) on the portfolio level, as suggested by Dingsøy et al. (2018b). Nevertheless, Alfa already uses such a high frequency of face-to-face interaction in PPM, as suggested by the PPM literature (Stettina and Schoemaker, 2018). It has been argued that the “Scrum of Scrums” presents an opportunity to share information across portfolios. However, it is not clear how such practices will scale beyond eight-10 teams (Rautiainen et al., 2011, Sweetman and Conboy, 2018). Thus, the organization needs more knowledge on how to utilize these face-to-face meetings as learning loops with a portfolio-level impact, and how to rethink this coordination (Dingsøy et al., 2018a).

To finalize our discussion on learning, we find limits to the role of strictly formal strategy for guiding PPM decisions and actions, as this is insufficient in Alfa’s turbulent environments

(Kopmann et al., 2017). Instead, Alfa assigns higher priority to responsiveness and flexibility than to visibility and predictability in formalized strategy. One way to foster emerging strategies is to let projects play a formative role in the enactment of the portfolio (Sweetman and Conboy, 2018). The manager finds this formative role very important and provided additional insightful comments. Projects in Alfa play (and are intended to play) a formative role at the operational and tactical levels, but not at the strategical level. For example, projects cannot make products that do not follow the very strict rules of the brand.

6 Refining the PPM evaluation framework

In this section, we present a set of learning and reflection points on PPM evaluation.

Based on the design and application of the PPM evaluation framework in Alfa, we elicit a set of learning and reflection points which can further refine the PPM evaluation framework and eventually emerge into a set of general design principles guiding PPM evaluation. The learning and reflection points are summarized in the following four sub-sections: *questions*, *methods*, *context*, and *use*.

Questions: The 20 questions of the evaluation framework are extracted from 20 different publications which are difficult to condense to one-point questions. Thus, our interviews were a constant negotiation and trial-and-error process of agreeing what could and should be included in the questions. For instance, many of the concepts are multidimensional: Management quality consists of information, allocation, and corporation quality (Jonas et al., 2013), and the three PMO roles include controlling, coordinating, and supporting (Unger et al., 2012). We found no useful way to merge these dimensions and therefore developed three evenly weighed sub-questions to represent the multiple dimensions. The abstract level of the concepts demands constant translation to the

concrete empirical setting and language of the organization. In this case, this process was aided by the fact that the manager we interviewed has a research background and more than 10 years of experience in PPM research and practice. This provided an opportunity to engage in mutually influential roles and reciprocal shaping, as advised by Sein et al. (2011b). However, this is unlikely to be the case in the majority of instances. As the target audience for our PPM evaluation framework includes both researchers and practitioners wanting to evaluate PPM, it is important to consider how the questions can be further refined to fit the language of these two domains.

Method: Applying the PPM evaluation framework did not only lead to a refinement of the content of the questions, but also a reconsideration of how the questions were asked, how the response was measured, and more broadly how the evaluation was conducted. During the interviews, we discussed how the questions should be framed – including how the “ideal” and “real” states of affairs should be assessed – and compared to what. We agreed that the manager should express his or her subjective perception of PPM. However, this provided the challenge that different actors in PPM may have different perceptions (Blichfeldt and Eskerod, 2008) and interests (Platje et al., 1994). Our PPM evaluation in Alfa reflects the viewpoint of the manager who is a PPM expert. One could argue that as PPM consists of ongoing activities and processes between the senior management, PPM management, and project management (Stettina and Hörz, 2015), multiple viewpoints should be taken into account.

We also discussed the scale on which the questions were scored. Most of the answers were placed in the extreme categories “1” or “5” on our five-point Likert scale. The manager suggested that a seven-point Likert scale would provide more fine-grained response options. Moreover, we could potentially increase the reliability of the answers by adding explanatory text with concrete

examples of extreme scores – like Shenhar and Dvir (2007) operationalization of the diamond model.

Context: As we tested the evaluation framework, we continuously discussed the specific contextual settings of Alfa and how this impacted the results. One learning point was that the questions would have different meanings depending on the organization's current development focus in PPM, e.g. the organization's prioritization of adaptability versus reliability (Bernstein et al., 2016). Both the vocabulary used by Alfa and the results of the PPM evaluation clearly showed that the focus of Alfa is on improving adaptability. To do so the organization aims to replace plan-based thinking with a so-called agile mindset. The manager repeatedly mentioned that most of the questions in the framework have explicit or implicit plan-based (or waterfall) assumptions. This seems likely as the PPM discipline, despite ongoing change, is dominated by this top-down thinking and linear thinking (Sweetman and Conboy, 2018, Hansen and Svejvig, 2018, Hansen and Kræmmergaard, 2014). Further refinement of the PPM evaluation framework should pay attention to the implications of these assumptions.

Use: Overall, the four evaluation approaches captured important aspects of the PPM in Alfa and fostered insightful discussions and reflections. Especially, the graphical illustration of the results in a spider's web provided a comparable and easy-to-understand overview of current PPM practices and improvement areas in the organization. The web clearly shows Alfa's strengths and weaknesses. Using the framework again in the same context at a later point in time can elicit insight into the development and potential improvement of PPM in Alfa. Despite the great potential of the PPM evaluation framework, it has its limitations and premises. In our instantiation, the result of the PPM evaluation rely on perception. Our results are based on how the manager perceives ideal

and real PPM practices. Thus, triangulating our findings with observation of PPM practices may provide other results.

In general, the PPM evaluation framework can be used in a variety of ways. For instance, the evaluation can be conducted by an independent assessor observing PPM and/or interviewing managers or by involving superiors and subordinates in the assessment process. The PPM evaluation framework can also be used as a self-reflection tool for managers who wish to continue to be reflective in and on their (PPM) practice (Rode et al., 2018). Most importantly, we recommend using the framework to stimulate further reflection – in an inner or shared dialog about current and future PPM. As such, the framework can facilitate a meta (re)consideration of the ideal and real states of PPM affairs. It can be used to ask and answer questions regarding single- and double-loop learning (Argyris, 1977) and to understand if project portfolio managers are doing things right and doing the right things. In this case, informal discussions after the instantiation in Alfa indicated that the evaluation results provided concrete inspiration for improving PPM. Such improvements can be leveraged by giving legitimacy, grounded in academic knowledge, to developing reoccurring organizational routines as learning loops at portfolio level.

Further research and instantiations of the revised and improved PPM evaluation framework can further refine the above learning and reflection points and eventually develop them into a set of design principles for PPM evaluation.

7 Conclusion

By answering the research question: *How can we develop a holistic and empirically validated PPM evaluation framework?* our paper addresses a gap in the literature on PPM evaluation, as we find no empirically validated evaluation models integrating existing knowledge on PPM evaluation.

Inspired by a multidimensional evaluation framework, we structure contributions from 20 PPM publications into four areas and develop a framework to facilitate a meta evaluation of PPM. The PPM evaluation framework contributes to practice by enabling practitioners to evaluate their current PPM efforts and identify improvement potentials. We contribute to research, as we respond to calls for more research on how PPM is conducted in real-life settings – by providing a first step toward developing and applying a theory-ingrained and -integrated PPM evaluation framework. Further research can show if the PPM evaluation framework can improve PPM in practice and apply the artifact in other organizational contexts to test its applicability and generalizability beyond the specific instantiation provided in this paper.

Appendix

Table 3: Data display from instantiation of PPM evaluation framework

Dimension	Questions, scores, and comments
Process	<p>Q1a. To what degree does your organization use (traditional) PPM processes and techniques (Reyck et al., 2005, Jeffery and Leliveld, 2004)? For example, NPV, ROI, Bubble charts, traffic lights, Stage-Gate models, etc. Score: 5</p> <p>Q1b. How important are traditional PPM processes and techniques to the success of the portfolio? Score: 3</p>
	<p>Q2a. How integrated are your PPM processes? We understand “integrated” as the seamless coordination and control across functions, units, and hierarchical levels (Hansen et al., 2017, Hansen and Kræmmegaard, 2013). This covers the process from projects entering the pipeline to follow-up on their completion (Ghasemzadeh et al., 1999, Archer and Ghasemzadeh, 2007). Score: 5</p> <p>Q2b How important is the aforementioned “integration” of your PPM processes to the success of the portfolio? Score: 5</p>
	<p>Q3a. How formalized are your PPM processes and practices (Teller et al., 2012)? Score: 5</p> <p>Q3b. How important is formalization of your PPM processes to the success of the portfolio? Score: 5</p>
	<p>Q4. To which extent is the PPM design tailored to the organizational design (Aubry and Lavoie-Tremblay, 2018)? Score: 4</p> <p>Q4b. How important is tailoring of the PPM design to the organizational design to the success of the portfolio? Score: 5</p>

	<p>Q5a. In what degree does the PMO exercise the roles of coordinating, controlling, and supporting (Unger et al., 2012)? Score: coordinating 2, controlling 3, and supporting 1</p> <p>Q5b. How important is the PMO effort of coordinating, controlling, and supporting to the success of the portfolio? Score: coordinating 4, controlling 1 and supporting 5</p> <hr/> <p>Q6a. What are the levels of information quality, allocation quality, and cooperation quality in PPM (Jonas et al., 2013)? Score: information quality 3, allocation quality 2, and cooperation quality 4</p> <p>Q6b. How important are information quality, allocation quality, and cooperation quality to the success of the portfolio? Score: information quality 5 (e.g. transparency of activities via use of backlogs), allocation quality 4 (though many teams are organized as dedicated resources, they still need coordination), and cooperation quality 5</p>
<p>Bench- marking</p>	<p>Q7a. To which extent does the organization use maturity assessment of PPM processes (OGC, 2006, PMI, 2008)? E.g. by assessing the maturity of the portfolio by the use of assessment tools such as the P3M3 tool developed by OGC (2006). Score: 2</p> <p>Q7b. How important is the use of maturity assessment of PPM processes to the success of the portfolio? Score: 2</p> <hr/> <p>Q8a. To which extent does the organization use assessment of PPM governance (Lappi et al., 2018)? E.g. by benchmarking the organization’s governance models to other companies’ governance. Score: 4</p> <p>Q8b. How important is the use of governance assessment of PPM processes to the success of the portfolio? Score: 3</p>

	<p>Q9a. To which extent does the organization use external or internal comparison of the project portfolio balance? E.g. by benchmarking the portfolio's distribution between: informational, strategic, transactional, infrastructure (Weill and Aral, 2006), or balance of strategic buckets (Chao and Kavadias, 2008). Score: 5</p> <p>Q9b How important is the use of external or internal comparison to the success of the portfolio? Score: 5</p>
	<p>Q10a. To which extent does the organization use data on project portfolio costs in internal and external benchmarking (Verhoef, 2002, 2005)? Score: 5</p> <p>Q10b. How important is the use of cost benchmarking to the success of the portfolio? Score: 5</p>
<p>Outcome</p>	<p>Q11a. How high is the effectiveness of strategic attributes? Effectiveness of strategic attributes involves strategic alignment, adaptability, and delivering the expected value (Patanakul, 2015). Score: in the planning process 5, in the retrospective process 1</p> <p>Q11b. How important is the effectiveness of strategic attributes to the success of the portfolio? Score: in the planning process 5, in the retrospective process 5</p> <p>Q12a. How high is the PPM effectiveness of operational attributes? This involves project visibility, transparency in decision-making, and predictability of project delivery) (Patanakul, 2015). Score: 5 (but lower in the process dealing with the retrospective)</p> <p>Q12b. How important is the PPM effectiveness of operational attributes to the success of the portfolio? Score: in the planning process X, in the retrospective process X (no score can be given to this question; see below comments to the question)</p> <p>Q13a. In what degree does your organization measure value creation at portfolio level (Laursen and Svejvig, 2016)? Score: expected value 4, realized value 1</p> <p>Q13b. How important is measuring the value creation at portfolio level (Laursen and Svejvig, 2016)? Score: expected value 5, realized value 5</p>

	<p>Q14a. To which extent is sustainability included in PPM? This includes non-commercial issues such as ecological, environmental, social, health, and safety values (Martinsuo and Killen, 2014). Score: 5</p> <p>Q14a. How important is sustainability in PPM to the success of the portfolio? Score: 5</p>
	<p>Q15a. To what extent is the logic of effectuation used in PPM? Effectuation is understood as decision-making using available resources rather than pre-defined goals to shape projects and emphasis on partnerships and networks over competitive analyses (Nguyen et al., 2018). Score: 2</p> <p>Q15b. How important is effectuation to the success of the portfolio? Score: 5</p>
<p>Learning</p>	<p>Q16a. To what extent does your organization use reoccurring organizational routines as learning loops (Stettina and Hörz, 2015)? Score: 2</p> <p>Q16b. How important is the use of reoccurring organizational routines (as learning loops) to the success of the portfolio? Score: 4</p> <p>Q17a. What is the degree of responsiveness and flexibility in PPM (Kock and Georg Gemünden, 2016, Kopmann et al., 2017)? Score: 2</p> <p>Q17b. How important is responsiveness and flexibility to the success of the portfolio? Score: 5</p> <p>Q18. In what degree does your organization use a high frequency of face-to-face interaction in PPM (Stettina and Schoemaker, 2018)? Score: 4</p> <p>Q18. How important is a high frequency of face-to-face interaction to the success of the portfolio? Score: 4</p>

Q19a. In what degree do projects play a formative role in the enactment of the portfolio (Sweetman and Conboy, 2018)?

Score: 4

Q19b. How important is the formative role of projects to the success of the portfolio?

Score: 5

Q20a. In what degree does your organization use scaling learning from project retrospective to the portfolio level (Dingsøy et al., 2018b)?

Score: 1

Q20b. How important is the use of scaling learning to the success of the portfolio?

Score: 4

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