Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung
https://doi.org/10.1007/s41471-023-00178-8

ORIGINAL ARTICLE

Making Sense of Projects—Developing Project Portfolio Management Capabilities

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Received: 9 February 2023 / Accepted: 21 December 2023

Abstract Project management and project portfolio management (PPM) foster competitiveness by facilitating the implementation of organizational strategy. Although organizations often struggle to develop PPM capabilities, the academic community does not have an in-depth understanding of the conditions for successfully developing these capabilities. In response, we conducted a multiple-case study with 50 interviewees to develop a theoretical model of the PPM capability-building process. This model is built on the notion of organizational sensemaking and identifies aspects that comprehensively explain why it usually takes so long to develop PPM capabilities. We conceptualize the PPM capability-building process as one that is strongly influenced by (1) the effects of structural rearrangements, (2) the appropriate use of external resources during that process, (3) the role of executive support and legitimization, (4) episodes of regression, and (5) the need for internalization and habitualization. In addition, we provide starting points for explaining organizational capability building in more general terms.

Keywords Project management · Project portfolio management · Capabilities · Organizational sensemaking · Interpretive schema · Capability building · External resources · Internalization · Habitualization · Legitimization

JEL M10 · M14 · M15 · O31 · O32 · O33

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Published online: 01 February 2024

1 Introduction

In recent decades, the market dynamics in technology-oriented sectors and beyond have increased dramatically because of disruptive technologies. As a result, many organizations have to adapt more frequently and quickly to new challenges and opportunities. To meet these challenges, organizations are becoming more and more project-based as projects constitute a flexible and relatively low-cost way for organizations to experiment with innovation opportunities (Gemünden et al. 2018; Sydow et al. 2004). Consequently, project management (PM) activities are increasingly important for the overall success of these organizations and are important, for example, for successful business process management (Plattfaut 2022) or technology-related projects (Yohannes and Mauritsius 2022). Over time, organizations experience the emergence of an increasing number of projects in various organizational units and on different topics. These projects rarely take place without interdependencies and therefore a need for coordination arises. Hence, organizations also need to care about project portfolio management (PPM) to manage and coordinate collections of projects to achieve the strategic goals and objectives of the organization (Patanakul 2022). PPM capabilities enable firms to deploy the resources required to execute the project in such a way that they foster project success, and they include aspects like "the organizational structure, the people, and the culture" (Killen 2015, pp. 1–2). Researchers have even acknowledged that PPM capabilities may promote competitive advantages and gains in firm performance (Almarri and Gardiner 2014; Pavlou and El Sawy 2011), as PPM is important for organizations to manage their projects effectively and efficiently (Mohammed 2021).

Given the potentially far-reaching positive impact of PPM capabilities on firm performance, it is key for organizations to understand and successfully master the PPM capability-building process. Early studies on general capability building have already indicated that this process is long-lasting, consists of several subsequent phases, and is expensive (Helfat and Peteraf 2003; Montealegre 2002; Pan et al. 2006). Given that firms also have to consider economic aspects, it is therefore not necessarily advantageous to invest in the building of dynamic capabilities. For example, this would make little sense if the competitive situation does not (yet) require them or if the benefits are less than the costs that the development of dynamic capabilities entails. Therefore, the development of dynamic capabilities is often only pursued when *ad hoc* problem solving (e.g., *ad hoc* fixing of project-related problems) would be even more costly (Winter 2003). Subsequently, researchers empirically investigated successful cases of PPM capability building. From these investigations, we know that the process requires some "up-scaling": Usually, it starts with smaller teams who take the lead, experiment, learn, and gain experiences that they later share with other members in the organization (Brady and Davies 2004; de Melo et al. 2020; Montealegre 2002). Furthermore, initiatives to further develop a firm's PPM capability are often a result of the outright failures of previous projects, ill-defined project portfolios, or other unexpected events (like in the case in Hoffmann et al. (2020)).

PPM capability building has rightfully been characterized as an organizational learning process (Brady and Davies 2004; Killen et al. 2008; Killen and Hunt 2010)

that appears to depend on intangible assets (Jugdev et al. 2007). In dynamic environments, in particular, this process is ongoing and incremental and not really a one-time endeavor (Killen et al. 2008). To the best of our knowledge, however, there is no integrated theoretical model that would explain the intricacies of the process of developing PPM capabilities. Hence, we have a limited understanding of when organizations leap forward, why they sometimes stagnate with their capability building, and why they sometimes even regress. This lack of research is surprising, since this lack of understanding represents a theoretical gap with significant relevance for managerial practice. This paper aims to shed light on this research gap by conceptualizing the PPM capability-building process. To do so, we do not focus on the portfolio level alone, but also aim to investigate all regulations, standards, practices, and processes that are "cross-project". This can also involve processes that are assigned to the management of single projects, but which are mandatory for all projects. This leads to the following research question we address:

How do organizations build and adapt internal IT PPM capabilities over time?

To answer our research question, we conduct a qualitative multiple-case study involving three medium- or large-sized companies and 50 interviews. We apply the sensemaking theory as a theoretical lens. By doing so, we refer to recent calls for future research that recommended the application of sensemaking within PPM research (Hansen and Svejvig 2022; Martinsuo and Geraldi 2020). The theory of sensemaking aims to describe how individuals and organizations make meaning out of complex and ambiguous situations. The concepts of sensemaking and sensegiving have been successfully applied to explain PPM-related processes (Martinsuo and Geraldi 2020; Roeth et al. 2019). However, until now, it has not been used to explain the process of PPM capability building. We believe that sensemaking can help to explain some previously unexplored facets of the PPM capability building process, for example its non-linearity (regressions, dropouts) or the complex interactions of different management levels. What we intend to develop is an in-depth description of the process of building PPM-related capabilities. This also involves an explanation of the temporal dimensions of this process, by pointing out, for instance, how resources are used within the process, why it is rarely linear, and how top management contributes to its success. As a result, we create a detailed theoretical model of the PPM capability-building process. Additionally, we derive a set of managerial guidelines that can serve as starting points for practitioners to avoid common mistakes in managing the PPM capability-building process.

In the remainder of this paper, we first present an overview of the existing literature on PPM from a capability perspective. Hereafter, we explain and employ the notion of organizational sensemaking to develop a theoretical model of the PPM capability-building process (section three). After that, we describe the method of our qualitative multiple-case study (section four) and briefly present the cases we investigated (section five). We then use the data from our study to derive key processes that comprehensively explain the temporal dimensions of PPM capability building (section six). Next, we discuss our findings and provide managerial guidelines and avenues for further research regarding successful PPM capability building and organizational capability building in general (section seven). Finally, we summarize the

paper's contribution, describe its limitations, and highlight suggestions for future research (section eight).

2 Prior Research On PPM as an Organizational Capability

Project management and project portfolio management are well-established concepts both in academia and in practice. According to a popular definition by Cooper et al. (2001), *project portfolio management* is a process in which (1) new projects are evaluated, selected, and prioritized, (2) existing projects are accelerated, eliminated, or deprioritized, and (3) resources are allocated and reallocated. In contrast to this process-oriented definition, however, PPM is increasingly conceptualized as a capability—a key concept of the resource-based view (RBV) (Killen et al. 2012). Research suggests that this capability is developed over time—often in relation to the development of according structures (Bredillet et al. 2018; Kaiser et al. 2015). According to the RBV, a company's strengths and weaknesses are based on its resources, which can lead to a sustainable competitive advantage if these resources are valuable, rare, inimitable, and non-substitutable (Barney 1991). From the RBV perspective, what is even more important than a firm's resources, is its capacity to deploy them. Accordingly, following the definition by Amit and Schoemaker (1993), we employ the notion of a firm's *capabilities* as referring to a firm's capacities to deploy its combined resources to reach a desired end. Capabilities manifest themselves in organizational processes that comprise regular and predictable activity patterns (Grant 1991).

By referring to a firm's capacities to deploy its overall resources, the notion of capability as employed here is located at the organizational level. It is important to note that aspects related to both humans and processes together form PPM capabilities of an organization (Killen et al. 2020; Killen and Hunt 2010; Müller et al. 2019). More specifically, when speaking of PPM as a capability, we refer to a firm's ability to deploy project-related resources like financial, human, and technical resources in such a way that the right projects are carried out and successfully support organizational goals. This includes organizational routines like project initiation, selection, prioritization, approval, controlling, and termination on the portfolio level. However, it might also include commonly agreed-upon practices for project planning and execution that are applied across (most) projects. Given that projects are rarely executed in isolation but embedded in larger organizational contexts (Martinsuo and Geraldi 2020), including PPM, we do not explicitly differentiate project from portfolio management capabilities. However, we demand that they include replicable routines related to projects that are adopted by the organization as opposed to individuals or small collectives.

There is evidence that PPM-related capabilities have a positive impact on global development programs (de Brentani and Kleinschmidt 2015), project portfolio success (Biedenbach and Müller 2012), and competitive advantage (Brown and Eisenhardt 1997; Jugdev et al. 2007; Killen et al. 2008). Following Maritan and Peteraf (2018), competitive advantages can be defined as "the degree to which a firm creates more economic value than rival firms in a given product market". Given these

beneficial impacts of PPM capabilities, it is not surprising that researchers try to understand when and how (PPM) capability-building processes are successful. Several researchers have developed theoretical models with the goal to explain capability-building within different areas and domains. Montealegre (2002), for example, proposes a model consisting of three consecutive phases to explain the building of capabilities needed for planning and implementing electronic commerce strategies. They characterize the process as cumulative and expansive by pointing out the relevance of spreading the strategic momentum in the organization through direction and leadership. Their paper indicates that capability building usually starts in small collectives and requires some "up-scaling" in a firm. Helfat and Peteraf (2003) also propose three phases but go beyond Montealegre (2002) by introducing the concepts of renewal, replication, and retrenchment, thus stressing the non-linear nature of the capability building process that may also include episodes of stagnation and regression. Brady and Davies (2004) emphasize that project capability building requires so-called "vanguard projects" for exploration and initiating organizational learning processes. Similar to Montealegre (2002), they describe that successful capability building involves the dissemination of experiences made within the organization, which requires support from executives. Pan et al. (2006) use the model of Montealegre (2002) and apply it to two different organizational layers (project and organization). A PPM-specific conceptualization of the capability-building process can be found in the work of Bredillet et al. (2018). Their contribution lies in pointing out that PPM capability building and structural adjustments (establishment of a project management office, abbreviated as PMO) may go hand in hand and influence each other in the form of co-evolution. Table 1 gives an overview of previous conceptualizations of the (PPM) capability building process.

While these papers represent insightful and valuable steps toward a better understanding of the capability-building process, the notion of *sensemaking* has not yet been applied to describe the development of PPM-related capabilities. In the following, we will specify and motivate sensemaking as the theoretical lens through which the process of PPM capability development is investigated in this paper.

3 PPM Capability Development as a Sensemaking Process—conceptual and Theoretical Foundations

PPM capability building turned out not to be a one-time endeavor but rather a long-time process containing recurring instances or refinement and optimization (Killen and Hunt 2013). Such refinement processes are often triggered by unexpected events during the PPM capability process. Existing literature on capability development has employed the notion of *organizational sensemaking* as a device for knowledge creation in response to unexpected events (Pandza and Thorpe 2009; Sheng 2017). Accordingly, analyzing this notion in the context of PPM would help to explain the process of PPM capability building. Especially, sensemaking might help to explain aspects of the PPM capability building process that are yet underexplored, for example its non-linearity (regressions, dropouts) and the social interactions between different organizational levels. The organizational levels that are relevant, here, and

Table 1 Previous conceptualizations of the (PPM) capability-building process

	(Montealegre 2002)	(Helfat and Peteraf 2003)	(Brady and Davies 2004)	(Pan et al. 2006)	(Bredillet et al. 2018)
Domain	Electronic commerce strategy	Generic	Project capabilities	Strategy formation and implementation	Project portfolio management and PMO
Characterization of the process	Cumulative, expansive, dependent on resources and actions	Lifecycle perspective; non-linear, involves paths like Renewal, Replication, and Retrenchment	Involves organizational learning, two levels of capability building (project, organization), role of 'vanguard projects'	Identical to/based on Montealegre (2002)	Capability building and structural adjustments are dynamic, interdependent, context-dependent, and cyclic (co-evolution)
Structure	*Three phases:*	*Three phases:*	*Three phases:*	Identical to/based on Montealegre (2002) with organizational and project-specific refinements	Cyclic, co-evolutionary process
	Establishing direction	Founding	Vanguard projects		
	Focusing on strategy development	Development	Project-to-project		
	Institutionalizing the strategy	Maturity	Project-to-organization		
Key resources discussed	Leadership, organizational culture, IT, long-term perspective, social networks	Organized team with relevant competencies, leadership, social networks/capital, financial resources, IT	Vanguard teams for exploration, senior management leadership	Decision-makers/management, knowledge resources from professional associations and institutions, benchmarking, IT, skilled teams, strategic partnerships	No in-depth discussion

between social interactions take place, are the top management, the multi-project-management, and single projects (Archer and Ghasemzadeh 1999; Blichfeldt and Eskerod 2008; Moore 2010). In the following, we will outline conceptual and theoretical foundations about sensemaking and how it can serve as a theoretical lens to explain the PPM capability development.

Over the past 40 years, sensemaking has received numerous definitions in the organizational literature. Regarding their foci, these definitions vary to such an extent that no established theory of sensemaking has evolved (Maitlis and Christianson 2014). However, a common conceptual core can be identified: Sensemaking is commonly defined as an attempt to gain an understanding of unexpected and confusing events (e.g., recurring project failures) (Cornelissen 2011; Gioia and Thomas 1996; Louis 1980; Maitlis 2005; Weick 1995) with the ultimate goal of identifying the kind of behavior that is appropriate for dealing with the new situation (Klein et al. 2006; Louis 1980; Maitlis 2005; Taylor and Every 1999). A sensemaking process includes extracting cues from a person's environment that help them understand the unexpected event in question and enable them to enact the environment (Maitlis and Christianson 2014). Furthermore, in the organizational literature, sensemaking is usually not understood as an entirely internal mental process but rather as a discursive process involving communication (Balogun and Johnson 2004; Maitlis 2005; Taylor and Every 1999; Weick 1995); accordingly, the ultimate goal of sensemaking is to enable an adequate kind of collective behavior (Maitlis 2005). The academic literature on sensemaking sometimes applies a complementary notion of sense*giving* (Gioia and Chittipeddi 1991; Maitlis and Lawrence 2007; Rouleau 2005), which indicates that even gaining a subjective understanding via sensemaking may be the outcome of interaction with others.

Individual sensemaking may result in an interpretive schema. The basic idea behind this latter notion is that a person's direct experience of a certain event still leaves open, to a large extent, how the person conceptualizes—that is, makes sense of—the event. In the philosophy of science, this idea is also expressed in the Duhem-Quine thesis (Quine 1975). Accordingly, different interpretive schemas lead to different and possibly equally acceptable categorizations of what is directly credited to experience. By contrast, a collective sensemaking process takes place within an organization and may result in the creation of a *shared* interpretive schema to facilitate the collective implementation of problem-solving measures. Interpretive schemas tend to be considered as systems of shared meanings, such as a common understanding of the root causes of recurring project failures. An important feature of interpretive schemas is that they tend to be resilient to change, which is why sensemaking often takes time. This paper will focus mainly on collective sensemaking processes and, consequently, also on interpretive schemas as collective systems of meaning.

Another important sensemaking-related notion is script. Scripts are usually defined as specific kinds of interpretive schemas, namely, schemas that refer to sequences of actions and events. Scripts, therefore, account for a person's "behavioral repertoire" (Gioia and Poole 1984, p. 450). More specifically, a script concerns a stereotypical (Abelson 1981) or prototypical (Gioia and Poole 1984) behavior that the person regards as appropriate in a given context (Schank and Abelson 1977).

These contexts are not necessarily conversational or social; instead, scripts underlie a person's stereotypical behavior in any kind of situation that is familiar to them, in the absence of surprising events. Accordingly, behavior guided by scripts is relatively subconscious and habitual (Louis 1980). As soon as surprising events occur, people disengage from their scripted behavior. Like interpretive schemas in general, scripts are not directly observable. Instead, they have to be detected indirectly as manifesting themselves in behavioral patterns triggered by situational cues (Gioia and Poole 1984). In the context of PPM, scripts manifest themselves in an internalized adherence to processes whose appropriateness may be specified in corresponding guidelines. Like interpretive schemas in general, scripts may be the result of collective sensemaking processes.

While PPM and sensemaking are distinct from each other, they are interconnected areas and concepts within the domain of organizational management. In the past, studies already explored the role of sensemaking in learning at the level of single projects (Ahern et al. 2014). Within recent research, there also have been calls to further explore the concept of sensemaking within PPM. For example, Martinsuo and Geraldi (2020, p. 450) state that future research should investigate "sensemaking and behavioral decision-making in project portfolios". Additionally, it is underexplored how people "translate, improvise, and make sense of projects in practice" (Hansen and Svejvig 2022, p. 285). Given that "sensemaking provides an interpretation of organisational learning processes" (Martinsuo and Geraldi 2020, p. 7), sensemaking is a suitable lens to explain the building of capabilities over time. Furthermore, as outlined above, different actors like individuals, but also groups and whole organizations are being considered in sensemaking as actors that make sense of complex and ambiguous situations. Likewise, the building of PPM capability building takes place within these different organizational levels and can involve individuals, teams, but also the whole organization. Hence, sensemaking can serve as a lens that can help to shed light on PPM capability building from a multifaceted angle.

Additionally, the notion of sensemaking may be fruitful for explaining the temporal dimensions of PPM capability building because of the following features: (i) Sensemaking is a discursive process, (ii) it alters or replaces interpretive schemas that are resilient, especially when they are conceptualized as collective phenomena, (iii) and it further seeks to alter or create scripts, which requires the habitualization of new practices. In the following sections, we present the results of a qualitative study that supports our conceptualization of PPM capability building as organizational sensemaking processes.

4 Research Method

We employed a *multiple-case study* approach to develop and corroborate our explanation concerning the temporal dimensions of PPM capability building (Yin 2008). This kind of qualitative approach is well-suited to generate an in-depth understanding of complex organizational phenomena within their situated contexts (Benbasat et al. 1987; Eisenhardt 1989) and constructing theories that are more or less generalizable across a range of contexts (Eisenhardt and Graebner 2007). Specifically,

we strive to establish analytical generalizability with our results. Thus, instead of making claims about an entire population, we provide explanations of high internal validity.

The unit of analysis of our study is the PPM capability-building process. The level of our analysis is the firm. Considering the theoretical foundation described previously, the PPM capability process includes key (organizational) resources, including potentially external resources, the social interaction between certain individuals and teams, and the temporal relationships of events. We investigated three instances of our unit of analysis between January and June 2017.

4.1 Selection of Cases

We based our *selection of case sites* on a theoretical sampling approach and used replication logic (Yin 2008). We concentrate on IT organizations within firms because they are widespread (essentially, every firm has one), and they act in an environment that is known for being highly turbulent, which requires them to adapt their capabilities rather quickly (Petit 2012). Moreover, they are characterized by a significant number of complex projects whose success is key for value-generating IT operations. Therefore, we expect IT organizations to take a more active and greater role in building PPM capability than with most other parts of a firm. We also wanted to examine the same type of PPM organization (within a firm) in all three cases to avoid adding further significant contextual differences that might otherwise emerge if we selected two IT organizations and one product development organization, for example. To maximize the internal validity of our theoretical results, we chose case sites to clarify and elaborate on the concepts and relationships that form part of our explanatory framework. Specifically, we looked for organizations that met the following criteria: First, the companies had to have reached a level of division of labor in their IT organization that enables them to install specialized PPM roles and structures. Second, the companies had to have several years of experience implementing PPM and had to have undergone several incremental steps of PPM capability building—which can be regarded as embedded cases for our analysis. Third, we looked for companies whose PPM professionals, business managers, and company executives were willing to contribute otherwise confidential information via interviews to our project. Fourth, we called for interviewees from various departments and in various roles, each with several years of PPM experience, who were able to reconstruct the PPM capability-building process based on retrospection and relevant documents. These documents included presentations used to discuss prior and current PPM structures, revisions of PM guidelines, process diagrams, and organizational charts. An anonymized list of the interviewees from each firm appears in the Appendix.

4.2 Overview of Cases

We recruited three firms for our study, each having already spent at least eight years developing their PPM capabilities. Each of the firms is headquartered in Germany

Table 2 Overview of cases

	Case 1	Case 2	Case 3
Sector	Digital business travel management solutions (part of a large air transportation group)	Development and production of electronic key systems	Development and production of heating, ventilation, and air conditioning (HVAC)
Established	Late 1980s	Around 1910	Around 1870
Employees	~ 180 IT & ~ 1000 total	~ 140 IT & ~ 5000 total	~ 135 IT & ~ 10,000 total
Revenue	> € 300M	> € 1500 M	> € 2000 M
Concurrent IT projects	~ 30	~ 35	~ 200
PPM context	Many IT projects necessary to implement product and service innovations. Short project duration necessary for competitive time-to-market	Big IT projects for international ERP rollouts. ERP implementations are crucial for efficient operations and overall compliance	In the beginning, IT projects for further developing ERP systems to enable efficient business processes. Since approx. 10 years, increasing relevance of digital products and services with a growing need for innovation

but has multinational operations with subsidiaries all over the world. Table 2 contains an overview of the three cases.

Each firm employs more than 100 IT employees and manages up to 200 IT projects. They have taken substantial initiatives to professionalize their PPM capabilities by PMOs or conducting larger transformation initiatives, such as establishing governance structures, managing growing project portfolios, or increasing project demands from business units. However, all three companies had faced considerable challenges and setbacks during their PPM capability-building processes.

4.3 Data Collection

The primary mode of *data collection* was conducting semi-structured interviews, which we triangulated, corroborated, and extended by using personal field notes and internal documents, such as governance handbooks, project management guidelines, reporting templates, and organization charts. At each case site, we conducted an initial briefing session attended by all the relevant contact persons to (a) inform them about the scope and purpose of the study, (b) plan required activities, (c) prepare the schedule, and (d) identify an initial set of qualified interviewees who were best positioned to answer questions about their PPM and its history. Despite the usual frequent turnover, especially among IT personnel, we were able to recruit 45 professionals as interviewees, mostly from IT departments, with an average PPM experience of at least three to four years. The interviewees cover a variety of different perspectives, including those of project managers, portfolio managers, IT department heads, heads of business departments, and heads of portfolio management departments (see Appendix for more detail).

We interviewed each participant in a face-to-face setting, and the interviews lasted between 30 and 90 min. Almost all the interviews were conducted one on one with

the participants. However, for reasons of efficiency, a handful of interviews were conducted with two or three participants. On these occasions, to avoid interviewees influencing each other, we ensured that the participants were from the same hierarchy level and that we would not have to face withholding relevant information due to confidentiality concerns. To ensure interview completeness and field note validity, two interviewers were present during each interview. A semi-structured interview guide served as a foundation for the interviews, which included questions about the current state of PPM in the firm and how it had emerged over time. We used the interviews to reconstruct the history of PPM at each firm, identifying patterns and key drivers of the different PPM capability-building episodes (see section five). The interviewees were apprised of the study's purpose, and they were assured that their responses would be kept confidential and anonymous. All the interviews were recorded and transformed into interview transcripts for later data analysis. All the interview transcripts were sent to the individual participants for quality assurance and approval. Quotations from German-speaking participants used in the remainder of the paper were translated into English.

4.4 Data Analysis

For our *data analysis*, we first conducted a briefing and preparation workshop with all the researchers involved in the coding process to ensure a unified coding and analysis approach. In line with Parks et al. (2017), we coded the interviews in several steps. Five researchers used the qualitative data analysis software ATLAS.ti to individually code an initial set of four interview transcripts, and each transcript was coded independently by at least two researchers. For each transcript, this process entailed labeling each potentially relevant statement with a code. Each code is also categorized into higher-level codes, and a relationship between the codes can be established. We initially used open coding techniques to identify preliminary codes and categories. Based on the approach proposed by Corbin and Strauss (2008), we then used axial coding to aid us in developing the categories into themes. Lastly, we conducted selective coding to integrate the categories into a coherent theoretical framework.

For example, based on our conceptual framework, we initially identified an "interpretive scheme" construct in the transcripts with a specific definition. We delineated this construct into subcodes that we expected to observe across several transcripts, such as "values," "scripts," "impact," "scope," etc., each having a specific operationalized definition. Whenever we came across a potentially relevant statement in the protocols, we coded it by following the constructs or creating a new code ("open coding"). Thus, each transcript was coded until we had reached theoretical saturation, meaning we continued looking for information in the transcripts until the categories were saturated and no additional data were found (Parks et al. 2017).

Based on the examination of the first set of interview transcripts, the researchers conducted a second workshop to compare the initial codes, each person's coding approach in practice, and any differences in understanding of the transcript content or codes. As a result of this workshop, we refined and extended the set of codes and their relationships and continued to code the remaining transcripts. During this

analysis process, we continued to review the literature on PPM, capability building, and sensemaking to revise our coding framework. Once the coding process was finished (i.e., when all transcripts had been coded by at least two researchers and we had reached theoretical saturation), we derived a set of research propositions based on an in-depth analysis of all coded passages.

In the following sections, we present the empirical results based on the approach mentioned above. First, we briefly summarize the history of PPM initiatives of each company (section five). Then, based on the major findings from each case, we discuss the research question and identify a series of propositions, leading to a process model of PPM capability building (section six).

5 Case Overview

In the following, we describe each organization's history of PPM initiatives and structure these observations based on the conceptual foundations (Table 3).

5.1 Case 1

The first company, that is a player within the air travel management industry, the introduction of multi-PM/PPM took place in 2007/2008. The years after this first phase of implementation were shaped by various severe problems, including uncoordinated management interventions that inhibited structured project execution, corresponding project delays, budget overruns, and resource conflicts. To address these issues, additional resources were provided by the top management and a PMO with a dedicated team was established.

In 2012/2013, steps were taken towards a more mature PPM adoption. The changes included the introduction of demand management, additional roles and positions, as well as a stage-gate model for structuring the process of project initiation, planning, and execution. In 2014, an audit in the context of a consulting project revealed that the company's projects took on average 207% of the time initially estimated. The problem analysis, which was based on project documents and interviews, revealed that project and portfolio processes were still subject to frequent executive interference from the top management. Moreover, resource requirements for the multitude of projects running simultaneously had been underestimated, and the corresponding time pressure resulted in "quick and dirty" IT solutions with significant architectural shortcomings and a lack of proper documentation and knowledge transfer. In 2015/2016, the company started to implement corresponding steps towards a more long-term-oriented PPM.

5.2 Case 2

Case company 2 designs and manufactures electronic key systems, primarily for the automotive industry. The company used IT projects mostly for introducing systems supporting business processes. Due to an increasing relevance of project work, in 2000, this company released initial guidelines for the execution of organizational

Table 3 Case data summarized and transposed to selected key concepts

	Case 1	Case 2	Case 3
Trigger for sensemaking	Significant project delays and budget overruns in crucial IT projects leading to long time-to-market for product innovations	Delays of global ERP rollouts with reduced organizational efficiency and increasing non-compliance with legal requirements	Chaotic project execution, limited transparency about projects' status, budget overruns and delays
Sensemaking process	Identified frequent and uncoordinated management interventions as problematic. Focused on addressing low process discipline. Lively discussions and conflicts in the management team	IT management efforts to understand the causes for ERP rollout delays revealed insufficiencies in PPM practices	Top management initiated an internal audit to assess the IT PM, PPM practices/guidelines developed
External Resources	Hired experienced PM practitioners and consultants for developing the PPM, later involvement of experts from a university for problem diagnosis	External consultants supported the development of PPM practices; PPM guidelines were adapted from PRINCE2 method	External consultant to support the development of PPM practices and the PMO according to PMI principles
Legitimization	Project proposal to the board, extensive communication program	Changes to IT leadership team (e.g., CEO); establishing of an PMO as a central point for PM-related matters	Establishing a PMO and regular board-level meetings to systematically address deficient PPM practices; Change of CIO
Habitualization	Dedicated training programs, ongoing supervision of PPM practices by selected staff	Enforcing the use of PPM guidelines and procedures in IT projects	Enforcing the use of PPM processes when planning IT demands

projects, which were revised four times until 2017. Over the years, however, the projects' compliance with these guidelines stagnated.

In 2008, it became clear that the organization needed more thorough PPM capabilities to execute its projects successfully. In 2011, ERP rollout problems in Asia and the resulting non-compliance caused an increase in *ad hoc* work. Overall, there was no comprehensive PM/PPM, and the projects were not steered professionally. To address these issues, consultants were hired to develop competencies and help implement PPM structures. However, the problems persisted. In 2014, the CIO was replaced. The new CIO pushed forward the establishment of an IT PMO department as a central point for all PM-related matters, including the responsibility to supply PM-related documents and templates (e.g., for project initiation and demand requests). Since 2017, the ongoing digitalization and the intensified collaboration across corporate locations, have posed new challenges to the professionalization of PM/PPM.

5.3 Case 3

Case company 3 belongs to the Heating, Ventilation and Air Conditioning (HVAC) industry and continuously expanded globally. In 2008, extensive international SAP projects revealed the need for more professional PM. Based on the problems faced with these IT projects, a small group of SAP and PM professionals developed a first comprehensive PM guideline. Around 2012, case company 3 wanted to transform itself to provide more services and a digital platform for their ecosystem. Based on this enterprise transformation effort and various smaller and disparate IT modernization efforts, the company's IT department struggled significantly to keep up with demands. Individual projects were negatively impacted due to resources shortages and the IT department could not deliver anywhere near the number of projects needed.

In 2014, a consultancy was brought in to conduct a large audit of the IT organization. Through a series of workshops, the project capacity and speed problems were discussed, and it was decided that a PMO must be set up, a portfolio process must be defined, and so-called Project Entry Boards (PEBs) organized. Also, in late 2014 some teams in case company 3 started experimenting with agile PM. Thereafter there were various starts and stops of the use of agile PM, with varying degrees of method conformity, and with varying levels of success, including some setbacks to plan-based PM.

6 PPM Capability Building as a Process of Sensemaking—Empirical Results

It is now time to return to our central research question, which we posed in the introduction: *How do business organizations build and adapt internal IT PPM capabilities over time?* To address this question, we present six research propositions, each of which refers to an important aspect contributing to a description of the

Table 4 Case data summarized and transposed to selected key concepts

ID	Explanation
Proposition 1	PPM initiatives commonly result from organizational sensemaking processes, which, in turn, are triggered by drastic experiences of project failure or delay
Proposition 2	Developing an effective PPM structure depends on the existence of a collective interpretive schema, which can only be obtained via a thorough organizational sensegiving process
Proposition 3	Even significant sensegiving efforts regarding the necessity of PPM may be futile if there is no additional legitimization, direct support, or personal adherence to PPM practices by the executives
Proposition 4	PPM capability building involves developing new scripts, requires a process of internalization and habitualization, and may lead to new organizational routines
Proposition 5	External resources and standards will only play a suitable role in further developing the PPM structure if they are integrated into an organizational sensemaking process
Proposition 6	The development of a collective interpretive schema necessary for PPM capability building tends to suffer setbacks in the event of significant organizational changes

process of PPM capability building, as well as an explanation of the temporal dimensions of this process. Following Bhattacherjee (2012, p. 13), we understand our propositions as "tentative and conjectural relationship between constructs" that we derived and developed from our interview data. Table 4 shows an overview and summary of the propositions we derived from our data.

In the following six subsections, we will explain in more detail how the six propositions presented above were developed. Additionally, the supplementary materials contain a detailed overview of certain interview quotations that we derived the propositions from.

6.1 Proposition 1—Trigger Events for Initiating the PPM Capability-building Process

The first aspect we identified concerns the motivation to initiate a process whereby PPM structures are established in the first place. Our main observation here is that transformation initiatives (e.g., those for developing PPM structures, which change the day-to-day routines significantly) need to be triggered by certain kinds of eye-openers. Usually, they concern alarming instances of project failure or at least entail negative collective experiences during project execution. Accordingly, in case 1, difficulties and struggles were mentioned, which ultimately provided the necessary motivation for certain PPM initiatives.

The analysis revealed that a similar kind of eye-opener occurred in case 3, where resource conflicts among different projects made it impossible to stick to the planned schedule since these conflicts were detected too late to make sufficient adjustments. Furthermore, a peak in frustration was reached in case 3 before the implementation of a project portfolio board: At a certain point, the business units' requests amounted to almost three times more than what IT could actually deliver, as insights from an interview with a project manager suggest (I48). Moreover, the projects that were approved predominantly depended on "who shouts the loudest" (I48), which led to a constant change in priorities. "Huge frustration" (I48) on both the business side and the IT side resulted in a recognition of the need for PPM. An interviewee from the IT management even described the situation before the implementation of a project portfolio board as one in which basic human needs were being frustrated (I46). This drastic assessment resulted, first, from the employees sensing they could no longer provide enough value to the company, which diminished their sense of self-worth, and, second, the unpredictable task overload creating an atmosphere of insecurity:

> "There was a core frustration among all IT employees that they couldn't satisfy customer needs. And at a certain stage, they couldn't satisfy their own needs either. [...] Humans have basic needs: One of them is security, another is significance, and yet another is a pleasant social environment. [...] When, at a certain stage, people don't feel significant anymore, when they don't feel valued in the sense that they can no longer bring value to the company when they aren't

> feeling secure anymore, because others are just constantly raising issues and they don't know what to do, when people don't feel comfortable in their social environment, change needs to happen." (I46, external consultant)

In addition to these personal impressions concerning working conditions, the realization of the need to establish PPM may also be triggered by problems during the execution of large projects, thereby making the importance of certain standards and documentation practices especially obvious. At company 3, problems of this kind occurred during several rollouts of the enterprise software SAP in different countries, which took longer than expected:

> "The duration of the [SAP] rollout was the main trigger. [...] We had a big bundle of countries where we had to implement SAP, so that means one SAP rollout for each country. We had a lot of mergers, so a lot of things happened. [...] All the knowledge was in the minds of a few people, and we had the situation that a lot of people left in one month; thus, we had a big problem here because we didn't have any documentation." (I43, IT senior manager)

Similarly, in case 2, the realization that change was needed resulting from a series of project delays in the context of an ERP rollout. Here, the need for guidelines and lessons learned was especially apparent when rollouts in certain headquarters proceeded very slowly, even though there had already been rollouts at other headquarters. The ensuing PPM initiatives benefited from this program enjoying considerable management attention. Moreover, the lack of proper project documentation—again similar to what had occurred in case 3—became critical on certain occasions because those who were mainly responsible for certain projects had left the company.

In section three, we defined sensemaking as a discursive process of understanding and explained the occurrence of unforeseen and confusing events that challenge the adequacy of current practices. The examples mentioned above all point in the same general direction: The initiation of PPM practices usually results from analyzing highly negative experiences during instances of project execution. These negative experiences are not yet sufficient to trigger attempts at establishing PPM practices, so the experiences in question must be synthesized into a kind of collective consciousness, and the right conclusions must be drawn from them. At company 3, for instance, a "very broad circle" (I40) of people was involved in developing a solution, and it took some time to collect all the opinions. The kinds of processes leading to PPM initiatives are, therefore, clear instances of organizational sensemaking, which allows us to formulate our first proposition:

Proposition 1 PPM initiatives commonly result from organizational sensemaking processes, which, in turn, are triggered by drastic experiences of project failure or delay.

As stated, each of our six propositions corresponds to an important aspect that helps provide a comprehensive description of the process of PPM capability building. Proposition 1 does so by partially explaining why many companies have still not managed to implement a properly functioning PPM structure: That is, the kind of drastic events that need to occur in the first place and the need for the development

of a corresponding awareness and proper understanding mean that PPM initiatives are often undertaken relatively late. Moreover, if PPM initiatives were taken without the kind of organizational crisis in question, a supplementary factor would slow down an implementation: That is, it requires a certain amount of time and effort for PPM processes to be established such that they produce visible, positive results, and this fact was mentioned several times throughout our case studies as a factor hindering the overall acceptance of these processes in the short run. A low level of process acceptance, in turn, leads to a slowdown in their implementation, if, for instance, guidelines are not properly followed.

6.2 Proposition 2—Sensegiving and a Collective Interpretive Schema

The second aspect we identified is closely related to the point mentioned above—namely, the difficulty of producing a level of acceptance throughout the company, which is necessary so that newly established PPM guidelines are properly followed. The analysis of the case studies suggests that the acceptance of PPM practices throughout the company requires a process of organizational sensegiving. That is, it requires a discursive process of providing meaning to and understanding of novel situations and practices, Ideally, this results in a collective interpretive schema that enables employees to grasp the company's current situation and understand the usefulness of adopting PPM practices.

The necessity of a collective interpretive schema that enables the success of PPM initiatives was clearly emphasized on several occasions during the interviews. For instance, in case 1, the employees responsible for demand requests observed that the current lack of a common future vision makes some of the Project Prioritization Board's project scoring practices nearly useless (I46). In particular, it was emphasized that scoring projects as either encouraging innovation, growth, maintenance, or productivity is useless unless there is consensus in the company as a whole (or, at the very least, among the Prioritization Board members) about which of these categories to focus on in a given period (I13).

Similarly, and from a more general point of view, in case 3, the IT side emphasized that PPM is not an end in itself but rather a "toolset" (I46). This "toolset" helps the company create the kind of value it wants to create, and having a common understanding of what this kind of value is supposed to be is a necessary basis for the success of PPM practices:

> "You want to create value, whether it's financial value or whatever, but you want to create something, and there should be a common understanding in the company, and this is the success factor of how to achieve this." (I46, external consultant)

At all three case companies, the discursive process of creating a collective interpretive schema that involves an understanding of both the mechanisms and the usefulness of PPM turned out to be a protracted process that has not been completed yet. According to the head of IT at case company 2, describing even basic concepts like project, project organization, and demand in a plausible manner to enable employees to stick to the guidelines and fill out relevant forms, among others, turned

out to be a challenge. Similarly, in case company 1, the person responsible for the Resource and Project Prioritization Board emphasized that it was necessary to "talk to everyone again and again" (I4) to create transparency, while at the same time formulating the relevant documents as understandably as possible. A project leader in the PMO at case company 3 even observed that after considerable sensegiving efforts, many employees still do not appreciate the justification for the bureaucratic overload, and consequently, guidelines are not followed: "Even if you explain, and we explained it a lot, and the [PMO] also explained it a lot, [...] people don't see why we're doing this." (I43, IT senior manager).

By combining these observations regarding the need for a collective interpretive schema and the process necessary to reach it, we can now derive our second proposition:

Proposition 2 Developing an effective PPM structure depends on the existence of a collective interpretive schema, which can only be obtained via a thorough organizational sensegiving process.

Given the protracted nature of the sensegiving process in question, proposition 2 contributes fundamentally to an answer concerning our central research question.

6.3 Proposition 3—Legitimization and Support by Executives

The third aspect revealed by our analysis concerns the observation that even significant, long-term efforts by those responsible for implementing PPM and convincing employees of the new practices' usefulness and necessity may be futile without further legitimization and support from the executive level. An example of how executives' attitudes can harm PPM is closely related to the aspect of exaggerated expectations regarding PPM's short-term effects. In particular, in case 1, "more and faster" (I5) was described as "one of the main slogans" (I5) that executives used to express their unrealistic expectations. According to the person leading the project management and standards team, all attempts to moderate these expectations initially failed: "And there we've tried—over and over again, I believe—to curb these expectations, and in that, I think, we usually failed" (I5). The resulting frustration caused "backlash" that slowed down the implementation process significantly.

Another aspect associated with the importance of executives' attitudes regarding PPM concerns how executives function as role models. The employees responsible for PPM practices at case company 1 emphasized the crucial importance of executives presenting themselves as persons who think strategically rather than opportunistically. Similarly, it was pointed out that official executive support will not be sufficient as long as they do not adhere to PPM practices. Here, past experiences at a different company were mentioned, where executives produced a state of chaos by not following PPM guidelines but, instead, relying on gut feeling as a criterion for project approvals.

> "Maybe you have to understand it to some extent from a psychological perspective. So, when someone has made it to the level of a company executive, [...] not everyone in this situation is capable of letting themselves be limited by some formalities and regularities." (I1, strategic demand manager)

Finally, even when there is executive support in terms of official legitimization and personal adherence to PPM practices, problems may still arise when actual PPM responsibilities are located far below the executive level in the company hierarchy. In case company 1, for instance, operative demand management is located four levels below the executive level, with the effect that, regardless of official support from executives, PPM rules and guidelines have only a limited degree of efficacy.

Combining these observations regarding the executives' crucial role in the implementation of PPM practices, we can advance our third proposition:

Proposition 3 Even significant sensegiving efforts regarding the necessity of PPM may be futile if there is no additional legitimization, direct support, or personal adherence to PPM practices by the executives.

Given that executive support cannot replace the protracted communicative efforts required to produce a collective interpretive schema and constitutes, instead, a further necessary condition for the successful implementation of PPM, proposition 3 is a further aspect that helps explain the temporal dimensions of PPM capability building.

6.4 Proposition 4—Internalization and Habitualization

Proposition 3 merely constitutes a factor that—mainly depending on the executives' initial attitudes toward PPM—*potentially* slows down a successful PPM implementation. By contrast, the next aspect we extracted from our case studies inevitably comes into play and, thus, contributes to explaining the *inherent* long-term nature of PPM capability building. The aspect in question concerns the necessity to properly internalize the new processes even when there is sufficient willingness to support the kind of organizational transformation involved in introducing PPM.

In case company 2, for instance, an employee responsible for implementing lessons learned pointed out that organizational transformation is generally difficult at this company, given that the company is still a medium-sized family enterprise with many employees working there for more than 20 years. In this kind of environment, it is difficult "to get rid of old habits" (I31) and acquire new ways of thinking. Likewise, in case company 3, the person responsible for the Portfolio Board process reported that massive efforts were required to explain the process and set the right expectations in the first year after its implementation. Owing to a "natural level of maturity" (I39), the situation became very different in the second year. At Case Company 1, many IT employees were used to an informal, unbureaucratic way of working and a direct manner of delivering and receiving tasks. The notion of a resilient mentality was also mentioned by an interviewee responsible for collecting requests, who underscored the difficulty of shaking off a mentality that allows the ideas of those who shout the loudest to get the most attention.

The lack of a strategy-oriented mindset observed here also manifested itself in the first round of strategic demand management at case company 1, which the person in charge of this process described as a "catastrophe" (I2). Again, a lack of strategic, long-term thinking was offered as an explanation. Over time, certain employees were said to have adapted to this manner of thinking. A central aspect of the new procedures, which turned out to require a long-term adaptation process, was the requirement to announce topics early enough for medium-term PPM to be possible at all. As the person responsible for portfolio budget management at case company 1 pointed out, the willingness to follow this procedure correlated with the recognition of its usefulness, and the disruption of this procedure by spontaneous project approvals has decreased over time. As the person responsible for portfolio budget management at case company 1 emphasized, many employees must still become accustomed to being monitored after having received project resources and the old practice of being on one's own after receiving the resources is still "in the heads of many" (I9).

One important aspect in that regard is *organizational routines*. Organizational routines refer to patterns of recurring actions within an organization that involve multiple actors and influence each other (Prenger et al. 2022). These routines are characterized by their repetitive and recognizable nature (Lin et al. 2020). Organizational routines can be seen as a form of collective behavior that is learned and performed by participants in response to selective pressures (Lin et al. 2020). According to Feldman (2000), change in organizational routines occurs as participants reflect on and react to the outcomes of previous iterations of the routine (Feldman 2000). This perspective introduces agency into the notion of routine, highlighting the role of participants in learning and institutionalization processes (Feldman 2000). As such, organizational routines can be linked to the concept of sensemaking, since sensemaking and the development of scripts are an expression of this "agency".

To develop PPM capabilities on an organizational level, it seems necessary to also introduce new routines that are steered by the organization. In case company 3, for example, projects were in the past often implemented locally (I41). This is a weakness, since a consolidated view is missing and "islands of competence" existed, leading to a loss of knowledge if people leave the company (I46). The latter point in particular might hinder the development of organizational capabilities that are sustainable and not bound to certain individuals. For example, in case company 1, one interview partner talked about the role of controlling and regulating the process and routines regarding PPM:

> "It is a regulated and a controlled process, and we at least know what we are doing and what we are not doing. And if we don't do it, we also know why we don't do it" (I3).

However, as it is also mentioned, the success of PM depends on how strictly rules are being followed (I41).

Taken together, the aspects mentioned above illustrate the need for habitualization and internalization, which naturally contribute to the long-term nature of implementing PPM practices. Using the conceptual framework that we introduced in our section on conceptual and theoretical foundations, we can employ the no-

tion of a script (i.e., the kind of interpretive schema that accounts for habitualized behavior in a given organizational context) to derive our fourth proposition:

Proposition 4 PPM capability building involves developing new scripts, requires a process of internalization and habitualization, and may lead to new organizational routines.

6.5 Proposition 5—External Resources and Standards

One might expect that the set of aspects mentioned thus far can be counterbalanced by drawing on certain *external* resources suited to support or accelerate the PPM implementation process. Such external resources may take various forms and might involve individuals, organizations, or other aspects of the external environment of the organization. Examples for external resources are, for instance, external consultants that provide experience with PPM initiatives, PPM standards that give orientation to improve the efficiency of executing relevant processes, or external knowledge like fashionable trends. However, there is no straightforward manner of relying on these kinds of external resources to speed up the implementation process and compensate for the aspects mentioned above. In particular, using external resources effectively to support PPM implementation requires that these resources be organically incorporated into internal sensemaking processes, which, in turn, cannot be completed in a short amount of time.

An example of the impossibility of relying solely on external consultants to design an approach to implement PPM occurred in case company 1, where an external consulting firm provided a concept for the implementation of demand management. After the consulting firm had provided an analysis and a solution design, the company implemented the latter. However, applying the external solution design proved to be much more complicated than initially expected: Suitable people had to be hired, and there were "significant postponements" and "friction losses" (I3). Overall, it took approximately three years to establish and stabilize the demand management process. Hiring an external consulting firm also increased expectations about the short-term effects of PPM in general. In turn, as already described above regarding proposition 2, this led to disappointment and slowed down the acceptance process. The company organized workshops where an external consulting firm presented a PPM conception with a counter-productive degree of maturity:

> "It was elaborated to a degree of maturity that we could never have reached *ad hoc*. And then everyone shied away and thought, 'Oh God, we'll never pull this off.' [...] I had a feeling this discouraged all of us a bit." (I12, portfolio manager)

Another illustration of the impossibility of relying on external personnel involves the employment of external project managers. For example, case company 3 employs more external project managers than internal ones. As a project leader in the PMO reported, it had been a "big target" to "make them aware of our project management" (I43) and ensure that they apply it; the two half-time positions devoted to instructing external project managers were described as insufficient.

The aspect of PPM implementation that involves using certain software tools and requires habitualization has already been mentioned in relation to proposition 4 above. A different perspective—one that exemplifies the need to integrate software tools into a sensemaking process—concerns the need for in-house development. In case company 2, for instance, the IT leadership pointed out that their envisioned ideal of a PPM software system (i.e., one that combines all relevant facets, such as budget, resources, demands, projects, priorities, etc.) goes beyond what the market currently provides. As a result, a suitable software system will have to be developed internally.

Regarding the deployment of standardized PM methods like Scrum or Kanban, the IT leadership at case company 2 also pointed out that *the* right method for the company does not exist. Instead, an appropriate mix must be found, which is tailored not only to the company's needs but also to each department's needs. Moreover, instead of continuously applying any such method, the focus should be on single instances of application, which requires frequent adjustments to the method. Moreover, besides established PM methods, sometimes even the use of a fixed rule setup must be conceded in favor of individual negotiations. In case company 3, for instance, the Project Entry Board and the Project Portfolio Board could not merely rely on a fixed rule for dealing with project delays, since a huge variety of issues might cause these delays; therefore, adequate decisions about the individual projects have to be made on a case-by-case basis.

Jointly considering all the above-mentioned insights regarding the measures required to properly integrate external resources and standards, we can now derive our fifth proposition:

Proposition 5 External resources and standards will only play a suitable role in further developing the PPM structure if they are integrated into an organizational sensemaking process.

6.6 Proposition 6—Episodes of Regression

A final aspect that has to be considered is that the path toward PPM capability building portrayed thus far does not, by any means, consist of a steady progression; it is usually subject to various episodes of regression, of which a few may even be regarded as features *inherent* to the process. These are features that often cannot be avoided; therefore, one has to take them into account when setting one's expectations of the efforts required for and the duration of the process.

A particularly striking example of a regression episode, which may well be regarded as unavoidable and, consequently, inherent to the PPM capability-building process relates to proposition 1. As described above, the kind of interpretive schema that constitutes the degree of awareness and understanding necessary for carrying out PPM processes with a sufficient degree of conscientiousness is usually triggered by drastic, negative experiences of project execution. As a result, regression episodes concerning this kind of interpretive schema quite naturally arise when those employees with a first-hand perspective on the negative experiences in question leave the company. In case company 1, for instance, a "brake effect" (I3) resulted from

the departure of certain important personnel, including the Head of IT, who was not only one of the most fervent promoters of demand management but also a key driver behind a structured execution of processes in general. As the Head of Demand and Operations Management reported, a central aspect of this slowdown was that explanations of PPM processes had to "start from zero" (I3) again. Even more importantly, a recognition of the historical reasons for introducing PPM in the first place was now lacking, since the new personnel had not experienced these triggers. Reportedly, the new Head of IT has still not understood why PPM was introduced.

Similarly, in case company 2, the departure of IT employees who had worked for the company for more than 15 years and had "grown into" (I23) the company's PPM structure led to large education and training needs for the new recruits. In case company 3, a negative development was observed during the time the company grew significantly. In the course of recruiting new personnel who did not have first-hand experience of the various eye-openers described above regarding proposition 1, attention to PM rules and templates went into a decline and no driver or sponsor was available to counter this development. Regardless of whether new staff joins the company, relapses of the kind mentioned above may also occur due to unfortunate allocations of responsibilities. In case company 1, for instance, the person in charge of the Resource and Project Prioritization Board reported that it had recently been expanded with additional members from the Executive Board. This expansion was perceived as a "step backward" (I3) since some of the new members were completely unfamiliar with the relevant topics.

Another instance of regression we encountered may be regarded as a particularly clear example of a challenge *inherent* in any organizational process, in general, that involves conflicting personal interests: In case company 3, an external consultant observed that as soon as people became familiar with the portfolio process, they tried to "find loopholes" (I46) to push through their personal "pet projects" (I46). In this case, even the IT management made such attempts, thereby providing bad examples to others and "discouraging compliance with the process" (I46).

The instances of regression mentioned above have deteriorating effects on the collective interpretive schema in terms of both understanding and motivation. The extent to which these effects contribute to the temporal dimensions of PPM capability building becomes especially clear concerning the enormous efforts of organizational sensegiving—as described above regarding proposition 2—required to arrive at a collective interpretive schema, which enables the proper execution of the relevant kinds of processes. Jointly considering the aforementioned aspects, we can now derive our final proposition:

Proposition 6 The development of a collective interpretive schema necessary for PPM capability building tends to suffer setbacks in the event of significant organizational changes.

6.7 Summary

When combined, these aspects make it possible to identify the interplay among the different processes included in PPM capability building and highlight the tempo-

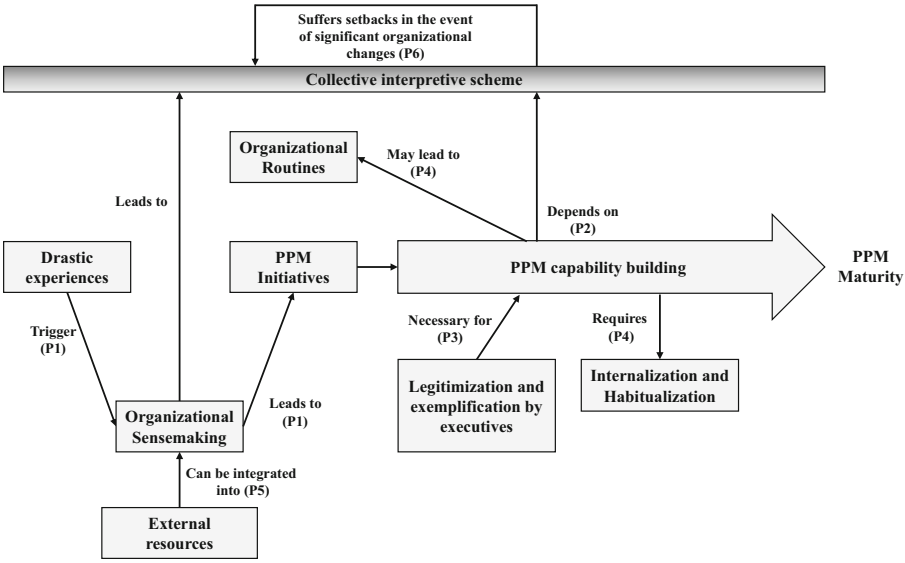

Fig. 1 Process model of PPM capability building

ral dimensions of the overall PPM capability-building process. Taken together, the propositions derived in this section form a picture that builds on the conceptual foundations presented earlier and offers a comprehensive answer to our central research question: First, for PPM initiatives to be undertaken, certain kinds of triggers in the form of drastic, negative experiences regarding project execution need to occur. Second, significant efforts in terms of organizational sensegiving are required to arrive at an appropriate, collective interpretive schema. Third, even these efforts may be futile without additional executive legitimization and support. Fourth, even if a collective interpretive schema provides an appropriate level of understanding and motivation, PPM capability building still requires the development of new scripts consisting of the internalization and habitualization of new processes. Fifth, the long-term nature of the aforementioned aspects cannot simply be circumvented by using external resources, since the latter can only play a suitable role in developing the PPM structure when they are integrated into an organizational sensemaking process. Finally, the above-mentioned long-term processes may be interrupted by episodes of regression. Figure 1 provides a depiction of the resulting process model, including the role of each of the propositions we derived.

7 Discussion

7.1 Theoretical Implications and Future Research

With the article at hand, we refer to recent contributions that called for further research on sensemaking and its implications in PPM (Hansen and Svejvig 2022; Martinsuo and Geraldi 2020). We aimed to extend the body of knowledge by inves-

tigating the PPM capability building process through the lens of the sensemaking theory. The building of PPM capabilities is a result of a complex process involving the experience of drastic events, subsequent sensemaking processes leading to new scripts (as "mental blueprints" for new PPM practices), legitimation of these practices through executives, and eventual internationalization and habitualization of new organizational routines. Only when all these process steps are successful, an organization can build new capabilities. While this is mainly an internal process within an organization, external tangible and non-tangible resources may have a significant impact, here. Still, it is important to note that external resources need to be incorporated in the sensemaking process when they are to unfold their potential for informing the capability building process. Without their inclusion they will hardly find their way into new scripts shared by organizational members, subsequent legitimation and eventual habitualization.

Our results reveal various intricacies of the PPM capability-building process that have not yet been recognized in relevant debates. Apart from this contribution to the PPM literature, the nature of our findings also suggests a potential for analytical generalization ranging from the particular context of PPM to other instances of organizational capability building.

In the three companies we have investigated, the capability building processes were always triggered and initiated in response to drastic events or changes. Given the empirical data we have, we believe that persistence in the face of change is always given, and behavioral changes therefore only occur when there is pain, or the actors see an urgent need for changing their behavior. Additionally, we can assume that the legitimization for change is much more difficult without any problems that justify it. However, it might be possible that there are other factors that start the capability building processes than we have observed. Future research should therefore investigate if there are additional triggers than drastic events that can lead to the building of PPM capabilities.

Regarding individual project success, the role of sensemaking and sensegiving in establishing mutual understanding among stakeholder groups has recently been highlighted (Jenkin et al. 2019). In addition to the effort associated with the relevant sensemaking and sensegiving processes, legitimization, direct support, and personal adherence by executives constitute further necessary elements. The importance of executive support has already been discussed in early literature (Brady and Davies 2004; Montealegre 2002; Pan et al. 2006). Our study suggests a particular function of executives in the sensemaking process that facilitates legitimization, internalization, and habitualization.

External resources—to develop solutions or to legitimize or support solutions that have already been developed—cannot be employed directly but, instead, must be subjected to internal sensemaking processes. In particular, external advice or knowledge has to find its way into a collective interpretive schema, and standardized tools, methods, and templates, among others, usually have to be tailored to individual companies, departments, or even incidents. While the role of external resources and partners was already acknowledged in previous literature (Martinsuo and Geraldi 2020; Pan et al. 2006; Vedel and Geraldi 2020), we offer additional explanations for how they are leveraged within the framework of organizational sensemaking.

Management fashions and trends that inform managers about certain best practices can have a potential impact on PPM capability building, as well. To do so, however, they need to find their way into the discursive sensemaking process. Nevertheless, additional research is needed regarding how external resources and forces might influence the process of PPM capability building. This also includes the question of how various external resources differ in terms of their influence. It is obvious that external human resources like consultants may play a different and more active role in the sensemaking process that intangible resources like PM standards or the aforementioned management fashions and trends.

As our interview data shows, the process of PPM capability building can lead to the development of new organizational routines. These routines are formed in the complex process of sensemaking including the development of new scripts, legitimation processes and subsequent internalization and habitualization. This could, for example, encompass routines for initiating, selecting, or controlling projects, as well as commonly agreed-upon practices for project (portfolio) management. As such, these routines can be regarded as a central outcome of the PPM capability building process. They represent manifestations of these capabilities.

The extent to which the aforementioned patterns underlying the PPM capability-building process can consistently be observed in the case of other instances of organizational capability building should be subject to further empirical research. To this end, our explanatory model may serve as a research hypothesis for potential investigations in this direction. However, the generalizability of our findings to other organizational capabilities would not be surprising because although the functions and outcomes of different capabilities may be clearly distinguishable (depending, of course, on the granularity with which they are individuated), the individual processes of capability *building* do have significant similarities.

7.2 Managerial Implications

Finally, in light of the described factors responsible for the challenges and setbacks that our case companies faced during their PPM capability building processes, we would like to point to certain managerial guidelines for the PPM development process. These points are not intended to be standards that are applicable to every case or company. However, we believe that these managerial recommendations can to an extent be expected to help practitioners avoid the same types of common mistakes regarding organizational capability building.

First, it has turned out that structural rearrangements could easily lead to major setbacks to a company's PPM capabilities, especially when PPM routines have not yet been properly institutionalized. Therefore, the susceptibility of PPM capability building—and capability building in general—to episodes of regression in the face of changes in an organization's personnel structure should be considered when deciding to move or replace personnel.

Second, consultants hired to foster the organization's PPM structure should be considered sensemaking facilitators. A corresponding conceptualization has already found its way into the organizational literature and several authors underline the need for consultants to initiate collective sensemaking processes (Boland and Yoo

2004; Czarniawska 2013; Ericson 2001; Kezar and Eckel 2002). Similarly, Lundberg (2012) discusses the role of consultants in organizational change from a sensemaking perspective.

Third, also PPM trainings and certificates should be oriented toward triggering sensemaking processes. As our findings illustrate, actual adherence to PPM practices depends heavily on the employees' understanding of the rationale behind the implementation of these practices. This point also conforms with a guiding principle proposed by Zollo and Winter (2002), according to which knowledge codification for dynamic capability building in general "should aim at developing and transferring 'know why' as well as 'know how'" (p. 349). Therefore, employees should be enabled to reflect on their company's situation to understand why PPM measures are appropriate in the given context. Therefore, trainings and certificates should not be too generic but, instead, involve reflection on actual, firm-related project events.

Fourth, here and in general, executives should appreciate the time it takes for PPM initiatives to show significant positive results. This need for patience entails, on the one hand, that the PPM implementation steps should not be too bold so that employees are not overwhelmed by unrealistic expectations and, on the other hand, that PPM measures should not be abandoned or ignored only because they fail to produce major short-term results.

7.3 Limitations

There are certain limitations to our research. First, conducting an in-depth multiple-case study arguably leads to certain constraints on the generalizability (across the entire population in question) of our findings. While our study provides reliable and valid explanations that are also transferable to other cases thanks to the extensive data analyzed, there is an opportunity for future research to examine our findings in a quantitative study to test their generalizability.

Second, the interviews, which form the basis of our qualitative study, covered to a significant extent historical events. Given also that the information relevant to our purposes concerns not only concrete, documented events but also personal experiences and attitudes, our study is, to a certain degree, susceptible to recall bias. We tried to minimize this risk by employing data triangulation and interviewing employees in several different positions and seniority from each case company, thereby pursuing a holistic, representative picture of relevant events. This risk is also slightly reduced by our analysis of historical documents that helped corroborate the interviews.

Finally, our reference to sensemaking processes in our explanation of the temporal dimensions of PPM capability building remains on a relatively abstract level. Given that, a more detailed examination of the actual social interactions that constituted the individual sensemaking processes could provide additional explanatory value.

8 Conclusion

The principal contribution of this paper is a new model of PPM capability building that provides, for the first time, a corresponding description and explanation concerning the process of building and adapting these capabilities. Based on interviews within three companies, we derived six propositions which together form a conceptual framework surrounding the notion of sensemaking in our qualitative case studies. Our results advance our knowledge of PPM capability building by making explicit what kind of social interactions in the sense of organizational sensemaking and sensegiving are required to foster capability building. Moreover, we can now better explain the particular role of top management in this process and how external resources can be leveraged. We can also close a gap in the literature by shedding light on the complex sub-processes of stagnation and regression. Furthermore, we draw attention to various implications and extensions of our findings, each of which provides promising avenues for further research. To some extent, our model can be analytically generalized to other instances of organizational capability building, given certain similarities among capability-building processes in general. Finally, we derived practical managerial advice regarding the process of PPM capability building, which is, again, generalizable to other kinds of organizational capability building.

9 Appendix

Table 5 Anonymized list of interviewees

ID	Case	Interview	Role	Duration
1	1	1	Strategic Demand Manager	90 min
2	1	2	IT Executive for Demand and Portfolio Management	60 min
3	1	3	IT Manager Demand and Operations	45 min
4	1	4	Senior Corporate Executive	60 min
5	1	5[a]	Director PMO	60 min
6	1	5 [a]	Senior Project Manager	60 min
7	1	6	C-level business executive	60 min
8	1	7	C-level business executive	45 min
9	1	8 [a]	Portfolio Manager	45 min
10	1	8 [a]	Strategic Demand Manager	45 min
11	1	9 [a]	Resource Manager	75 min
12	1	9 [a]	Portfolio Manager	75 min
13	1	9 [a]	Portfolio Manager	75 min
14	1	10	Demand Management Director	45 min
15	1	11 [a]	Customer Services Director	90 min
16	1	11 [a]	IT-Business Consulting Director	90 min
17	1	11 [a]	Finance Services Director	90 min
18	1	12	Managing Director	60 min

Table 5 (Continued)

ID	Case	Interview	Role	Duration
19	1	13 [a]	Executive for Demand Marketing	60 min
20	1	13 [a]	Executive for Demand Finance	60 min
21	1	13 [a]	Executive for Operations Support & Services	60 min
22	1	14	IT Executive Director	45 min
23	2	1 [a]	IT Senior Manager PMO	60 min
24	2	1 [a]	IT Project Manager	60 min
25	2	1 [a]	IT Project Manager	60 min
26	2	2 [a]	IT Senior Manager PMO	45 min
27	2	2 [a]	Project Team Leader	45 min
28	2	2 [a]	Project Team Leader	45 min
29	2	3 [a]	Project Team Leader	45 min
30	2	3 [a]	IT Senior Manager PMO	45 min
31	2	4 [a]	Project Team Leader	45 min
32	2	4 [a]	Member of PMO	45 min
33	2	5 [a]	IT Senior Manager PMO	45 min
34	2	5 [a]	Project Team Leader	45 min
35	2	5 [a]	Project Team Leader	45 min
36	2	6	IT Senior Executive	45 min
37	2	7	IT Coordinator	60 min
38	2	8	IT Security Auditor	75 min
39	3	1	IT Senior Executive	90 min
40	3	2	IT Senior Manager PMO	60 min
41	3	3	Process Manager	60 min
42	3	4	Product Manager	60 min
43	3	5	IT Senior Manager	30 min
44	3	6	IT Senior Manager PMO	60 min
45	3	7	C-level business executive	30 min
46	3	8	External Consultant	90 min
47	3	9	Process Manager	60 min
48	3	10	Project Manager	60 min
49	3	11	Process management executive	60 min
50	3	12	Process Senior Manager	60 min

Please note: In case 2, there were 11 unique interviewees (resulting in a sum of 45 interviewees across the three cases). In case 2, two interviewees participated in two interviews, and another interviewee participated in four interviews

[a]Indicates that the interview included more than one interviewee

Supplementary Information The online version of this article (https://doi.org/10.1007/s41471-023-00178-8) contains supplementary material, which is available to authorized users.

Funding Open Access funding enabled and organized by Schmalenbach-Gesellschaft and German Academic Association for Business Research.

Declarations

Conflict of interest F. Ahlemann, P. Bergan, E. Karger, M. Greulich and S. Reining declare that they have no competing interests.

Ethical standards For this article no studies with human participants or animals were performed by any of the authors. All studies mentioned were in accordance with the ethical standards indicated in each case.

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