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Modelling Organizational Project Management

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Abstract

The contemporary discourse on Organizational Project Management (OPM) complements project, program and portfolio management with emerging elements, such as governance, projectification, PMO, or organizational design. This creates the need for an integrated model, that defines the content and roles in OPM. The paper addresses this by conceptually developing a seven layered model that organizes 22 OPM elements, spanning from the corporate level to the management of individual projects. A theory is developed to explain the interaction of the elements and the layers within the model.

Keywords: Organizational project management; organizational design; governance of project management

Introduction

Organizational Project Management (OPM) conceptualizes the *integration of all project management-related activities throughout the organizational hierarchy or network*” (Drouin, Müller & Sankaran, 2017, p.10). It developed from the need to conceptualize the role and interaction of temporary organizations (such as projects) within the wider scope of permanent organizations, jointly aiming to deliver beneficial change (Turner & Müller, 2003). Initial approaches to OPM modelling concentrated mainly on the integration of projects, programs

and portfolios of projects via processes and policies (PMI, 2003). Since then, a number of related topics developed in the academic and practitioner literature, such as governance, benefits realization management etc. The common denominator of these topics is that they are a) key topics for successful OPM implementation, but b) that they are insufficiently linked together or modelled to show their particular roles and the nature of their relationships. Examples include the redundant positioning of benefits realization management as simultaneous functions of governance (PMI, 2016), of OPM (PMI, 2014), and of program management (PMI, 2017b), while neglecting pivotal OPM functions such as projectification of the organization (Lundin, Arvidsson, Brady, Ekstedt, & Sydow, 2015; Midler, 1995), strategic multi-project approaches (Blomquist & Müller, 2006), or organizational design for OPM (Hobday, 2000), to name a few.

This identifies the need for a less redundant and more systematic model of OPM, which guides academics and practitioners in understanding the implementation of OPM by identifying the existence and profiling the intent of OPM functions in an enterprise, in order to develop and analyze implementation patterns, their contextual contingencies and their relationship with organizational results. The present paper's purpose is to address this need by developing a comprehensive OPM model, that goes beyond the traditional view of projects, programs and portfolios (3Ps) and allows to assess and profile organizations as to their particular OPM implementation. The aim is to identify the OPM functions currently addressed in the related academic literature and exhibiting them as interactive elements of a larger OPM model. For that we pose the following research question:

What are the project-management related elements of OPM and how are they integrated?

The Unit of Analysis is the relationship between OPM elements covered in the project management related research journals in recent years.

The paper broadens the perspective towards OPM by identifying and integrating crucial OPM elements which are currently dealt with as separate topics in the literature or hidden under higher abstract levels in existing models (i.e. Gemünden, Lehner, & Kock, 2018; Shenhar & Dvir, 2007). To achieve this the elements of OPM are conceptually identified and subsequently modeled contingent on their mutual dependency (i.e. their cohesion) to form layers of OPM and by establishing the interaction of these layers (i.e. adhesion) to form a model. This leads to a seven-layer “onion” model of OPM. The model shows the constituting elements of each layer and their integration across layers. The elements are described in terms of their functions, and the layers in terms of their integrating features stemming from the conditions they provide for the elements of the neighborhood layer of the “onion”. A layered onion model was chosen, because it allows to visualize the relationship between the elements independent of their implementation as either a hierarchy or a network or a hybrid of both in organizations, and provide a possible evolution framework for organizations.

A contingency theory perspective is applied within an organization theory context, assuming that organizational design implementations at all levels are contingent on their particular context, and particular combinations of context and elements provide for superior performance (Donaldson, 2001). We follow Meyer, Tsui and Hinings (1993, p.1177) who define contingency research as *an approach whereby researchers seek to understand the behavior of a social entity by separately analyzing its constituent parts*.

The paper links to and extends the recent work on organizational design of OPM, especially the work by Simard, Aubry and Laberge (2018) who based their model on the integration of governance, organizational design, and governmentality. The present paper adds a further level of granularity to their model. The present paper also builds on the hypotheses put forward by Miterev, Mancini and Turner (2017b) that project-based organizations need

idiosyncratic organizational designs, which are resilient to constant change (Miterev, Turner, & Mancini, 2017c) by providing a model to identify and profile organizational OPM implementations.

This benefits academics by providing them with an integrated model of often isolated topics, for them to theorize on the level of OPM elements and OPM in its entirety. Practitioners benefit from a cohesive understanding of the nature and types of OPM elements and their functioning as a system, which allows for learning and optimization of existing OPM implementations in organizations.

For ease of understanding, the layer-development is described from the inside to the outside of the “onion” model. However, the categorization of OPM elements, their functions and organizational integration are described from the outside to the inside, to allow for assessment of existing organizations, profiling them, and theorizing on their OPM implementation.

The paper briefly introduces the related literature, followed by the methodology, the layer-development process, the empirical validation of the model, a discussion to develop theory and ends with conclusions.

Literature review

In this section we briefly describe the development of OPM and the theoretical perspective of this study.

Organizational Project Management

The development of OPM is described by Crawford (2006) as a sequence of two discourses. The first one starting with the evolution of tools and techniques which developed into a distinct body of knowledge, followed by a focus on OPM capabilities. This initiated a second discourse on espoused versus practiced theories, leading to standards in project, program, and portfolio management, and related maturity models for OPM, turning the discourse towards OPM capability development. During that time the practitioner-oriented literature focused mainly on the existence and expression of functions and processes of the “3Ps” in organizations, like OPM3 from PMI® (PMI, 2003), while the academic literature identified OPM as ‘*a new sphere of management where dynamic structures in the firm are articulated as a means to implement corporate objectives through projects in order to maximize value*’ (Aubry, Hobbs & Thuillier, 2007, p.332). Subsequent years brought the awareness that OPM is more than the “3Ps” and that the implementation of OPM varies widely across organizations. Building on their initial understanding, the practitioner and academic streams of literature developed within their particular sphere. Here the former stream recently introduced the concept of principles to support processual implementations of OPM, where processes are understood as sequences of tasks (PMI, 2017c), whereas the latter stream of literature emphasizes discontinuity in organizations, where processes are seen as responses to unpredictable external trajectories requiring a resilient OPM implementation, which is able to adjust to situational contingencies with a capacity to bounce back to its equilibrium state in order to accomplish organizational strategies in a flexible way (Aubry & Lavoie-Tremblay, 2018). Alongside these ontological differences and the lack of agreement about the logical fit of subject areas (as shown with the example of benefits realization above), is the published research on OPM, which ranges across a variety of subject areas in a rather disconnected manner. This diversity of subject areas includes the use of strategy management theories like Resource-based View and Dynamic Capabilities Theory to explain parts of OPM (Drouin &

Jugdev, 2014), the value creation through OPM in government agencies (Oliveira & De Muylder, 2012), the relevance of maturity models (such as CMM), ISO Quality standards and OPM3 for the 3Ps (de Carvalho, Laurindo, & Pessôa, 2009), and the use of project management methodologies in organizations (Vaskimo, 2016).

A first attempt to structure and describe the variety of OPM related subjects in an integrated way was done in the recently published *Cambridge Handbook of Organizational Project Management* (Sankaran, Müller, & Drouin, 2017), which categorized the nature of OPM in terms of strategy, organizational design, human resource management, leadership, governance, as well as emerging areas, such as marketing, sustainability, and social media. As an edited volume, it covered many subject areas of OPM and their impact, but did not address their integration into a cohesive model.

Hence, the existing literature portrays the field of OPM as scattered and dispersed subject areas, insufficiently integrated over organizational levels or networks. This knowledge gap is addressed in the present paper through a conceptually derived model of OPM and its constituting elements.

Contingency theory as theoretical perspective

The aim of this study is to model OPM elements to better understand their mutual contingencies and implementation patterns in organizations. Contingency theory supports this from a theoretical perspective, as it is based on the premise that organizational design factors vary contingent on their context (Donaldson, Clegg, Hardy, & Nord, 1996). Developed in the 1950s the theory resonates with Burns and Stalkers' (1994) classic studies on mechanistic and organic structures being appropriate for stable and unstable organizational environments respectively. Contingency theory is based on the principle that a

unit, like an organization (or OPM element), performs better if its structure is aligned with its context. Earlier versions identified 16 different structural designs for the management of the interactions between projects in multi-project / multi-product organizations (Donaldson, 1985). Criticism of the one-dimensionality of the theory - that not only context shapes organizational designs, but also designs shape contexts - led to the refinement of contingency theory's premise to that of being mutually influential and the axiom of 'structural adjustment to regain fit' (Donaldson 1987), which postulates that the ultimate cause of structural change is a change in the contingency variable. From this perspective the need for structural change (like implementing OPM in an organization) arises from the substandard performance which comes from the mismatch of structure (elements) and contingency (their contextual elements) (Donaldson 1987). Translated into the present study, contingency theory explains the reciprocal determination of OPM elements, that is, their positing against each other, by assessing their mutual impact, measured as the coherence among the elements into groups, named layers (like water molecules form into a drop of water) and the adhesion between these cohesive layers (like a drop of water's adhesion on the surface of a glass).

Methodology and layer development

Our research follows Chia's (2013, p.33) recommendation: *Thus, to do real justice to the practices of organizational project management, researchers must return again and again to the phenomena they investigate, to glean ever-newer insights into their inner workings. In this way, by relentlessly offering ever-novel perspectives, research helps prevent the tyranny of a dominant orthodoxy, facilitates the democratising of knowledge, and encourages the interminable search for better ways of managing and organizing to fulfil our human potentiality.*

For this and to develop an integrated model of OPM we aimed to integrate the variety of OPM related subject areas into a cohesive model, wherein each subject area becomes an element of the model. Elements are hereby understood as “An essential or characteristic part of something abstract” like a model (Oxford Dictionary 2018). We then took the following steps:

1. *Literature search* of the project management literature to identify those organizational contributions to OPM that are intra-organizational, but external to individual projects’ management. This identified the individual elements that make up OPM.
2. *Identification of logical relationships* between elements and their strengths. Decisions on the strengths of these relationships were, whenever possible, based on existing literature. We distinguished hereby between logical *cohesion*, that is, a strong logical strength between elements which form a layer of the model, and logical *adhesion*, which is the strength of the logical relationship between these layers. This resulted in the shape of the onion model. Our point of departure for development was an individual project’s management. We selected those identified elements which have a strong mutual relationship (cohesion) and collectively a strong relationship with project management (adhesion). That identified the first layer above project management. The same approach was used for the development of the subsequent layers, until the list of identified elements was exhausted (examples below).
3. *Identification of the enablers, inhibitors or constrains* that adjacent layers have on each other. This followed Johns (2006, p.386), who posits that behavior in organizations is context dependent. Context is defined as “*situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as functional relationships between variables*”. In line with earlier studies we assumed the

predominance of a context-to-element effect, rather than vice versa (Johns, 2006; Mowday & Sutton, 1993). This provided for the conceptualization of the role of each outer layer as the context for the elements in the next inner layer of the onion.

4. *Modeling* by naming and visualizing the layers and their elements into the onion model shown in Figure 1.
5. *Development of a theory* about the interaction within and between the layers of the model.

Validity and reliability was addressed at step 1 above by using ABS listed, established and relevant journals for element identification, at step 2 by following grounded theory's established technique of *constant comparison* of elements and their linkages with each other, then between element and layer, and then between layers (Strauss & Corbin, 1990). At step 3 we referred to descriptions within the selected publications, and performed validation sessions among the authors of this paper, as well as practitioners from the industry, including practicing managers and Executive Masters students in academia. For step 6 we build on existing theories by Simard et al. (2018) and Müller, Zhai and Wang (2017b).

Identification of elements

Elements were mainly identified through scanning of the mainstream project management research journals (i.e. *International Journal of Project Management*, *Project Management Journal*, and *International Journal of Managing Projects in Business*) for their OPM related published topics between 2013 and mid 2018. This indicated the elements listed in Table 1. Subsequently, a scholar.google.com search on articles published in journals related to projects provided the hits shown in Table 1 (search criteria: element name from Table 1, source criteria: journal and project, period: 2013-2018). It shows the number of articles with the element name in its title, and the number of articles with the element name in its text. This rough overview is indicative of the presence and popularity of the individual elements, either

to the extent that articles are fully devoted to elements, or include elements as part of their research study and conclusive theory. The presence of the elements confirms the original list, indicating that some elements are less popular than others, but still present.

To reduce redundancy, steering groups/committees were used as a proxy for the Roles & Institutions element, and contracts as proxy for the Relations element. Being aware that the final elements will be broader in scope, this was done to keep the number of hits within a reasonable range which reflects the publications of the most popular approaches.

Table 1: Presence and popularity of elements in project related research journals

<i>Element name</i>	<i>In title</i>	<i>In text</i>	<i>Element name</i>	<i>In title</i>	<i>In text</i>
Project-based organization	7	192	Portfolio management	58	669
Project-oriented organization	4	70	Portfolio optimization	0	188
Process-oriented organization	0	3	Benefits realization	1	102
Multi-project strategy/approach	0	3	Program	135	3,160
Strategic/organizational PMO	0	6	Megaproject	22	151
Projectification	6	169	Project	2,980	26,200
Governance paradigm	0	11	Project management methodology	8	238
Governance model	1	35	Policy	29	7,180
Governmentality	5	49	Contracts	40	2,750
Governance of project management	11	56	Steering Group/Committee	0	258
Portfolio strategy	1	18	Project management	1,430	6,470

Identification of layers

Our starting point for development of the model was the management of the individual project, which constitutes the nucleus of activities in OPM. The scope of the OPM model was set to reach from the management of the individual project to the boundaries of its parent

organization, that is, the organization's interface with the market. Hence, we took an organization-internal perspective toward OPM. For that we assessed and classified OPM elements step-by-step for the strength of their mutual relationship, which is, their cohesion. Groups of highly cohesive elements formed a layer. The order of layers was assessed by the strength of the logical relationship of layers, thus, their adhesiveness, with new layers formed when the logical cohesiveness of a set of elements exceeded the logical adhesiveness to the next layer.

Examples include, the strong cohesion between institutions and roles in project governance (such as steering group and/or PMO), policies for project management, types of relations in form of (psychological) contracts, and project management methodology, as described, for example, by Müller, Andersen, Klakegg and Volden, (2017a). The element cohesion was classified as higher than the cohesion with other elements and higher than the adhesion with other layers (such a project management). This qualified those elements as a layer in the model. In line with the literature, we named this layer project governance and positioned it closely to the project management layer (Crawford, Cooke-Davies, Hobbs, Labuschagne, Remington, & Cheng, 2008).

The next layer is identified using the same approach. The related elements address the form of organizational integration of project related work and its governance. Does the organization treat projects as sovereign, autonomous entities with idiosyncratic governance structures (Artto, Kujala, Dietrich, & Martinsuo, 2008); or as integrative parts of a program and therefore governed in dependency of other projects in the program (Maylor, Brady, Cooke-Davies, & Hodgson, 2006)? Alternatively, the organization may perform or engage in megaprojects, whose governance is closer to that of temporary firms, with a large number of sub-projects and suppliers (Flyvbjerg, 2014), and potentially their own legal entities, such as

Special Purpose Vehicles (Sainati, Brookes, & Locatelli, 2017). Jointly the three elements shape the way project related work is executed. We named this layer *organizational integration*. The characteristics of its three elements influence the choices on the project governance layer.

Along the same logic the next layer was identified as that of *business integration*. Here the strategies and decisions on business opportunities and benefits realization decisions are addressed. This layer includes the traditional elements of portfolio strategy, portfolio management and optimization, as well as benefits realization (Killen & Drouin, 2017). Collectively these elements have a direct influence on the mix of (mega)projects/programs to execute, hence the organizational integration layer. This layer is governed by – and therefore adjacent to - the *OPM governance* layer.

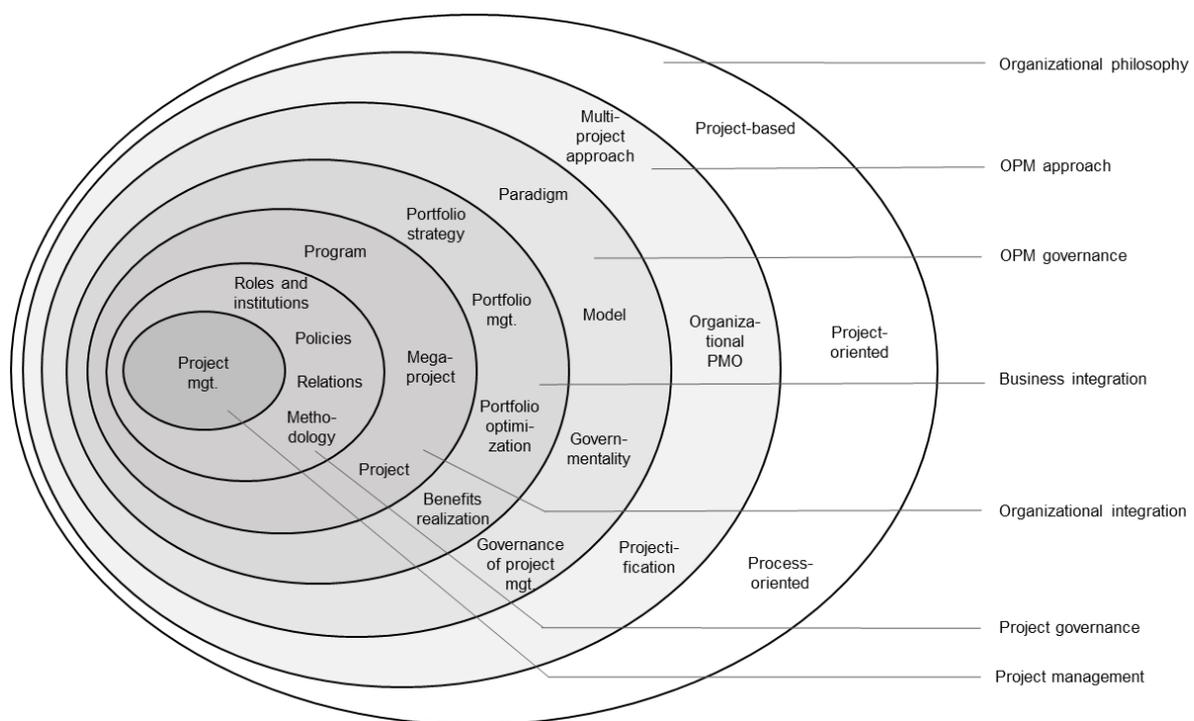
OPM governance defines the governance of groups or the entirety of all projects in an organization, thus, is different from project governance, which addresses only the governance of a single project (Müller, 2017b). This includes the determination of the organization's governance paradigm for projects (the ways projects are controlled within the particular corporate governance settings) and the preferred governance models, as well as the governmentality approaches (the leadership approaches chosen by those in governance roles when they interact with those they govern), and the extent to which project management is developed as a profession and a service within the organization, including the development of project managers and their capabilities (Müller, 2009; 2017a). This layer is then most directly linked with the organization-wide approaches to multi-project management.

Elements of this *OPM approach* layer are the principles of multi-project management as chosen by top management of the organization. This includes principles on the choice of project business to be in and the nature of the portfolio to pursue – the multi-project approach

(Blomquist & Müller, 2006), the existence of strategic or organization-wide project management offices (OPMOs) (Aubry & Lavoie-Tremblay, 2017), and the level of projectification of the organization (Lundin et al., 2015). The multi-project approach and the OPMO address the overall strategy in terms of handling the entirety of projects in the organization, and projectification determines the extent project-thinking pervades an organization's day-to-day business, for example in terms of having career and development ladders for project managers.

The final layer – *organizational philosophy* – groups elements that define how the organization presents itself to the marketplace and interacts with its partners, suppliers and customers. This is expressed by either being project-based (all work is done in projects), project-oriented (work is done in projects, even though it could be done in a process), or process oriented (all work is done in a production process) (Miterev et al. 2017b; Söderlund, 2004). Figure 1 shows the final model.

Figure 1: The onion model of OPM



The seven layers span the scope of the entire organization, from the individual project to its governance and structural integration in the organization, its business justification, the organization—wide and strategic governance approaches, up to the presence in the marketplace. More details on the individual elements are provided below. Not all functions of an organization become visible through the above approach, as functions may cover several elements simultaneously. Examples include support functions like human resource management (HRM), which is a significant part of projectification, but also present in governmentality and governance of project management. Another example is information technology (IT), which underlies many of the elements and enables the communication among them.

Modeling OPM

The following explains the functioning of the model from the outside to the inside. This is also suggested when assessing organizational practices against the model.

Organizational philosophy

This outer layer - organizational philosophy - describes the organization's appearance to their stakeholders, and defines the basic foundations of OPM practices. It indicates the organization's understanding of their business and the way the interaction in the marketplace is legitimized. From an OPM perspective, the organizational philosophy can materialize in three distinct forms of organization, which are as process-oriented (ProcOO); project-oriented (POO); or project-based organization (PBO).

ProcOOs are typically structured by functional lines and work is done in permanent organizational entities in pursuance of production processes. This is beneficial in relatively stable markets, for mass-production, and building of economies of scale. Projects in these organizations are few and mainly to optimize production in terms of costs or other economic measures (Hobday, 2000).

POOs are typical for more dynamic markets. Management decided to run the business by projects, even though a process-orientation would also be possible (Turner, 2018). These organizations consider management by project as their strategy. They use temporary organizations as a strategic choice for value delivery to clients. These organizations empower their employees, use flat structures, and strong customer orientation to achieve competitive advantage (Gareis & Huemann, 2007).

PBOs are required by the nature of their deliverables to work in projects. Their unit of production are projects, which brings up the need for project specific control systems and associated higher transaction costs (Turner & Müller, 2003). Hobday (2000) modelled the different types of project organizations and concludes that the more project-oriented/based the organizational form, the more innovate and flexible organizations are in their response to customer requirements. However, this declines their ability for efficient task execution, building of economies of scales, and promotion of organization-wide learning.

The extent of project mindedness in the organization's philosophy sets the stage for the next layer. For example, the extent projects are seen as the 'normal' way of doing business in the organization impacts the choices at subsequent layers.

OPM approach

The higher the project mindedness at the philosophical layer, the more the OPM approaches of multi-project approach, organization-wide PMO, and projectification are likely to be felt in the rest of the organization.

Multi-project approaches refer to the strategy for the entire set of projects in the organization.

Four types of strategies are described by Blomquist and Müller (2006):

- a) *Multi-project strategy*: organizations accept any project they can get, neither the resources are necessarily shared nor are the objectives aligned across projects. Project personnel is hired when a project gets awarded and made redundant when the project ends.
- b) *Program strategy*: organizations prefer projects that contribute to higher level objectives, such as program objectives. This often implies that project goals interlink, but resources cannot be shared across projects
- c) *Portfolio strategy*: organizations prefer projects that predominantly use their existing employees. Hence, the resources are shared, but projects objectives might vary.
- d) *Hybrid strategy*: organizations balance the program and portfolio strategy in an attempt to maximize both utilization of existing resources and accomplishment of higher level objectives.

The choice of multi-project approach is impacted by the organizational philosophy layer, with ProcOOs tending toward multi-project strategy whereas PBOs tend to aim for program, portfolio or hybrid strategies.

Organization-wide (i.e. strategic) PMOs (OPMOs) are entities that provide services for OPM improvement by developing or providing project management methodologies, policies, standards, and global reporting for the organization (Roden, Joslin, & Müller, 2017). By

doing that, they set the corporate-wide project management standard, for example, by defining the reporting requirements, training curriculum, methodologies to be used, or by reducing the number of projects with cost and/or time overruns (Accenture, 2010; Ernst & Young, 2006). OPMOs should be distinguished from the more tactical PMOs, which appear at the project governance layer and are concerned with individual projects and their delivery (Müller et al., 2017a).

Projectification relates to the extent project thinking pervades the organization (Midler, 1995) or even society (Lundin et al., 2015). Its dimensions include a) the importance of project management in the organization, b) the existence of a career system or path, including training and certification programs for project managers, c) projects as the principle form of exchange in business relationships, d) the percentage of business based on projects, and e) a project mindset and culture by the employees. Higher levels on these measurement dimensions indicate higher levels of projectification (Müller et al., 2017b). As before, the extent of projectification is strongly influenced by the organizational philosophy and its project orientation.

Together the three OPM approach elements set the stage for the next layer, which gives direction and explains governance for OPM.

OPM governance

This layer provides the governance for groups of projects, programs and portfolios of projects. Governance is hereby understood as being different from management, whereby managers' goal oriented activity to accomplish project objectives (i.e. management) is steered, controlled and limited by the structural framework (i.e. governance) set by governance institutions (Müller & Gemünden, 2018).

Contingencies from the OPM approach layer can include OPMO and projectification impacting the ability to govern project management by developing project managers and project management as a professional service. OPMOs typically take on the task of determining these boundaries and developing project management services for the organization. It provides program, portfolio or hybrid strategies at the OPM approach layer for more outcome-oriented governance paradigms for projects (Müller, 2009).

The first element addresses governance paradigms, which are shared mental patterns about the means and ends of the management of groups of projects in organizations. Four paradigms are often found, which represent the corporate governance approach as being mainly shareholder-oriented or stakeholder-oriented, and the ways project managers are predominantly controlled within this orientation, that is, by achievement of project results or by process compliance. This results in four distinct governance paradigms (Müller & Lecoeuvre, 2014):

- Conformist paradigm (CON) exemplifies organizations with a shareholder orientation (as opposed to a stakeholder orientation) with strict behavior control of the project manager (i.e. process compliance), in an attempt to lower overall project costs
- Flexible Economist (FE) paradigm exemplifies shareholder oriented organizations with a control focus towards expected outcomes. Here the aim is also to keep project costs low, but through careful selection of project management methodologies
- Versatile Artist (VA) paradigm exemplifies organizations with a stakeholder focus and output control. These organizations balance the multitude of requirements stemming from the many different stakeholders of the organization's projects. Hence their focus is more on value creation than lowering costs

- Agile Pragmatist (AP) paradigm exemplifies stakeholder orientation and controlling by process compliance, in order to maximize usability and business value of a project's product, through a time-phased approach to product release of functionality over a period of time.

Related to that are the governance models, which are guidelines and standards used for governance of groups of projects. Prescriptive (a.k.a. rule based) and non-prescriptive models exist. The former typically provides detailed processes and activities (e.g. PMI, 2016), while the latter provides principles of good governance, without determining the work or its processes (e.g. APM, 2011). A blended model is found in the ISO 21505:2017 Standard, which includes processes, tasks and institutions, but also emphasizes the importance of organizational values, policies, statutory and more principle-based approaches (ISO, 2017).

Governmentality is a combination of the words governance and mentality, which describes the attitude (mentality) of those in governance roles toward those they govern, and how that is reflected in the way they present themselves to those they govern (Barthes, 2013). Three approaches to governmentality are typically found: a) *authoritative*, where the governors give clear and non-ambiguous direction, b) *liberal*, where governors use economic means to steer the decision making of those they govern, and c) *neo-liberal*, where governors set a particular value system for the organization to influence the self-governance of those they govern (Dean, 2010). Its relevance for OPM is shown in several studies (e.g. Müller et al., 2017b; Simard et al., 2018).

Governance of project management relates to the governance of the project management professional capabilities and practices in the organization. It addresses questions like “how much project management is enough for the organization?”, or “how senior shall our project manager be?”. A three step framework described by Müller (2009) allows to assess this

element by distinguishing between a) step 1 – basic level: organizations using basic training in project management, project methodologies, steering committees, and audits of troubled projects; b) step 2 – intermediate level: organizations using all of the basic level plus project manager certification, PMOs, and mentor programs, and c) step 3 – advanced level: covering all measures of a) and b) plus advanced training and certification, benchmarking of project management capabilities, and maturity models. The majority of organizations are found at the basic and intermediate level, with few extending into the advanced level.

This layer sets the stage for the integration of these groups with each other from a business perspective.

Business integration

The previous layer explained governance of groups of projects to facilitate their effective management leading to the business integration layer. For example, a process-based governance paradigm and rule-based governance models, are often associated with more numbers-driven portfolio strategies and optimization techniques. Contrarily, more outcome related governance paradigms, principles-based governance models, and liberal and neo-liberal governmentality are often paired with more results oriented portfolio strategies and more strategy related optimization techniques and benefits sought after (Müller, 2009).

The portfolio strategy element defines what the project portfolio is expected to achieve (Voss, 2012) and guides the day-to-day management of the portfolio. It links project selection with the strategic objectives of the organization (Jugdev, 2017).

This informs the PPM element, which *“deals with the coordination and control of multiple projects pursuing the same strategic goals and competing for the same resources, whereby*

managers prioritize among projects to achieve strategic benefits (Martinsuo, 2012, p.794).

This results in the structuring, resource allocation, steering, and exploitation of the portfolio, with the aim to prioritize projects, maximize effectiveness in resource usage, and contribute to metrics of strategic goals achievement (PMI, 2006); and has a major impact on the achievement of the organization's strategic objectives (Kopmann, Kock, & Killen, 2017). Depending on the expectations laid out by the OPM governance level (Unger, Gemünden, & Aubry, 2012), and the particular context and situation of the organization, more rational and process related approaches or more subjective and outcome/political approaches to PPM might be pursued (Martinsuo, 2012).

The next business integration element is portfolio optimization. Goals and approaches to optimization are manifold, ranging from mathematical approaches using financial perspectives (Sharifi & Safari, 2016) to qualitative and subjective approaches (Müller & Stawicki, 2006). In a series of studies Cooper, Edgett and Kleinschmidt (2004) categorized the different approaches in three frequently found patterns. These may be applied on their own or in combination:

- Value maximization: Optimizing the portfolio for accomplishment of a particular threshold value of all projects, typically of financial nature, like Return on Investment or Net Present Value.
- Balancing: Similar to an investment fund, this approach builds on the mutual cancellation of risks in heterogeneous groups of projects. Projects are selected based on a balanced weighted measure of a number of parameters, like level and nature of risk, duration, technological newness etc.

- Strategic alignment: Each strategic objective is assigned a budget value, which adds-up to the portfolio budget. Only when projects clearly fall into the realm of one of these objectives they get funding through their specific “strategic bucket”.

The choice of optimization approach should be linked with the portfolio strategy.

The last element - benefits realization - ensures that once the most appropriate projects are selected they are shaped and scoped to optimize their alignment with business needs, ensuring delivery of their benefits. This requires tracking and measuring (Bradley, 2014; Zwikael, Chih, & Meredith, 2018). This element is strongly linked with the three other elements of this layer, as they jointly ensure achievement of the strategic goals of the organization.

This layer impacts the way organizations go about creating these benefits.

Organizational integration

Opportunities selected at the previous layer are integrated at the organizational integration layer into the existing organizational context, its structures and workflows. Contingencies inherited from the previous layer include, for example, product line decisions, such as a new model by an automobile manufacturer, which will most likely lead to program approaches at the organizational integration layer (Müller, 2009), as the end of the model’s life-time cannot be predicted and the success in the market over time will tell in which years the program will get more or less funding. On the other hand, decisions made on the further development of existing products, or new technology or product prototypes, will most likely lead to new projects. In cases where the investment is very large, as in megaprojects, and potentially shared with other firms and the public sector, it is not only likely that a major part, if not all

of the organization engages in this megaproject, it is also likely that specific legal entities are created as separate firms, known as ‘Special Purpose Vehicles’ (SPVs). The setup and maintenance of them is expensive and therefore mainly used in megaprojects (Sainati et al., 2017, p.60).

Programs are *“temporary organization[s], in which groups of projects are managed together to deliver higher order strategic objectives not delivered by any of the projects on their own”* (Turner & Müller, 2003, p.7). Programs can be categorized in temporary programs, which have defined end dates, like a series of software projects ending in a new Enterprise Resource Planning System (ERP), or they can be semi-permanent, that is, without initial end-date, as in the case of a new car model of an automobile manufacturer, where the market determines the life-time of the product and with it the program (Müller, 2009). Program objectives are often related to the goals set by the business integration layer by aligning them with the strategy and the management of its benefits. Programs unfold as a number of interrelated projects, whose goals are aligned to achieve benefits not achievable with one project alone. This requires centralized program management, made up, at least, of program manager and program steering committee, which jointly constitutes a governance function for the individual projects within the program. Hence the elements stated for the project governance layer are executed for the program level at the organizational integration layer.

Megaprojects are large scale, typically complex ventures that are characterized by costs of more than USD 1 billion, and/or affecting 1 million people or more, and/or lasting several years. Despite the difficulties of planning them realistically, megaprojects are increasingly popular worldwide (Flyvbjerg, 2011). Engaging in megaprojects has significant implications for the organizational integration layer, as the sheer size, volume and visibility of megaprojects impacts priority and scheduling decision to a large extent.

Projects are temporary organizations delivering clearly identifiable outcomes within the limits of scope, time and cost budgets (Atkinson, 1999). Projects deliver new products or services which provide their investors with new or improved competencies or marketing opportunities. In addition, the operation of the output will typically payback the investment, and, over time, contribute to the business objectives of the organization (Turner, 2014). For PBOs, and to a large extent also for POOs, projects are the building block of their business and their unit of production. For ProcOOs, projects are a way to maintain competitiveness and bring about change in the organization. As such projects require organizational dynamics that allow for temporary structures and dynamic roles and responsibility assignments, together with clear accountabilities for project managers, as described by Midler (1995). This layer lays the foundation for the governance of the identified projects.

Project governance

The organizational integration layer described above provides the organizational means to integrate the business opportunities identified at the business integration layer into the organization's workflow. The present layer, addresses the elements that govern the individual projects.

The elements of this layer are contingent on the decisions made at the organizational integration layer. For example, if it is decided to implement a business opportunity through a program, then the governance of the program's projects requires standardization of reporting requirements and often synchronization of project management methodologies across all projects in the program, as well as synchronization of contract strategies across projects, and project steering committees that involve the program manager. All this is decided at the

organizational integration layer and implemented for each individual project at the project governance layer. If the choice of organizational integration is the project, then reporting requirements, methodology and contract decisions, are more idiosyncratic for the project, within the constraints of corporate practices and standards set at the OPM governance layer. In case of megaprojects yet another mix applies, as large numbers of both suppliers and stakeholders with different objectives must be integrated, which requires hierarchies of contracts, potentially several governance institutions, respecting industry and public policies alike and the integration of different methods, or development of megaproject specific methods (Klakegg & Volden, 2017).

Governance provides the structures for defining the goals of the projects, for providing the resources to execute them, and for controlling their progress. Governance structures often include governance institutions, like project steering committees or PMOs, contracts between organizations participating in the project, policies for the organizations executing the project, as well as an agreement on the processes used to manage the project, that is, the project management methodology (Turner, 2014).

Project governance institutions are predominantly steering groups and tactical PMOs. The former hold the ultimate responsibility for project results and consist at least of the project sponsor or owner, but frequently includes representatives of the main suppliers, end-users of the project's output, higher management and others (OGC, 2008). These committees execute their tasks by initiating the project, controlling the process and planned for accomplishments at defined milestones, and deciding on project closure. Their accountabilities to higher management include achievement of project results at all levels, ensuring the required transparency of the project, and ethical and fair business conduct. Responsibilities include identifying and appointing project managers, providing agreed upon resources, controlling

the project, and providing advice to the project manager on an ad-hoc basis (Crawford et al., 2008).

Tactical PMOs typically engage in a governance role by auditing and recovering troubled projects, providing project-specific advice to project managers, and facilitating organizational learning at the project level (Hobbs & Aubry, 2007; Pemsel, Müller, & Söderlund, 2016). Implementations of PMOs are idiosyncratic for organizations, and vary considerably.

Organizational policies provide principles to guide decision making. Policies are communicated as statements of intent (e.g. how project management is done in an organization) and implemented as procedures or protocols. Governance institutions, like steering committees, adopt policies for framing or steering the project and its manager in terms of decision making, processes to follow, or rules and responsibilities to be respected (Müller, 2017a).

Relations between parties involved in a project are governed in various ways, ranging from informal relationships to formal contracts. An internal project within an organization is likely to be governed by the informal relationship between sponsor, project manager, and end-users, using agreed upon documents, such as project plans, as psychological contracts among the parties. A project with other companies typically requires formal contracts to govern the collaboration of the parties. Contracts are sets of “*promises between the parties, which the law will enforce*” (Dingle, Topping, & Watkinson, 1995, p.244). They provide the legal framework for the parties in the project, determine accountabilities and responsibilities. They also regulate the distribution of risks (Müller & Turner, 2005; Turner, 2004).

The project management methodology constitutes the interface between project governance and project management. It is looked at by a steering groups as governance tool, as it defines

the roles, responsibilities, process, milestones and control points in the project. At the same time, it is looked at by the project manager as a management tool, as it provides guidance in the planning and implementation of the project. Several types of methodologies exist. Waterfall methodologies provide the traditional process of upfront planning and life-cycle stages of concept, planning, implementation & control, and close-out of the project, separated by stage-gates. More contemporary agile methodologies are predominantly iterative in their process and require less upfront planning than waterfall approaches. The choice of a methodology depends on project type, contract type and the extent the project's product is understood by the time the project is launched (OGC, 2008). Specific methodologies exist for megaprojects. These projects emphasize correct upfront planning to avoid expensive cost-overruns at later stages (Klakegg & Volden, 2017).

This layer provided the framework within which project management should be executed, which sets the stage for the individual project to be managed.

Project management

The management of the individual project is the kernel of the onion model. It is defined as *the application of knowledge skills, tools and techniques to project activities to meet the project requirements* (PMI, 2017a, p.716). The activities of the project manager are framed by the governance layer. Within this framework the time, cost and scope/quality objectives are typically used to judge on project management success at the end of the project. The accomplishments of business objectives are assessed later, when the project's output is in use, in order to judge on project success (Cooke-Davies, 2002). The latter is described under benefits realization management above.

This completes the description of the elements and layers of the model.

Discussion

This paper is the first to develop a model for the integration of all project related activities in an organization (i.e. OPM) and its constituting elements. This was accomplished through the methodology outlined above and its resulting seven-layer model, which hosts the 22 elements of OPM. While it is impossible to analyze the entire complexity of the reciprocal determination of elements within the scope of this article, we take a contingency theory perspective to first theorize on the relationships of elements within layers, and then between layers. Finally, we build on more granulate theories in combination with the study's findings to theorize on the mechanisms of the interaction between elements and layers.

Within layer relationships

Each layer is either characterized by mutually exclusive, integrated, or complementary elements, which together form the governance of the next layer. For example, Hobday (2000) identified the need for different organizational designs contingent on a process (ProcOO) or project-orientation (PBO) of the firm. Miterev et al (2017b) further refined the latter in POO and PBO organizational design choices to host OPM. The choice among the three identifies the organization's way of presenting themselves and the way of interacting with their customers in the marketplace. Decision for design choices are influenced, among others, by the nature of the business and the strategy of the organization (Miterev et al. 2017b) and the degree of isomorphism in adapting existing design patterns (Miterev, Engwall, & Jerbrant, 2017a). The three choices present themselves as mutually exclusive in their respective domain, for example, a PBO oriented part of an organization will not apply any of the other

two philosophies in this PBO domain, but maybe in other parts of the organization that do not fall under the PBO domain. Hence, the elements at this layer are mutually exclusive.

This is different from elements at the OPM approach level, which are integrative because they mutually support each other, like a high level of projectification is often coupled with an OPMO to improve project management, and sophisticated approaches for selecting projects for the organization, such as in hybrid approaches (Müller et al, 2017b). Similarly integrated are the elements at the OPM governance layer, as governance paradigms, models and governmentality should be aligned and synchronized in order to serve the chosen OPM approach within the given philosophy (Müller, 2009). Highly integrated are also the elements of the business integration layer, where (with the exception of benefits realization – due to practiced ignorance by many organizations) the elements for portfolio strategy, process and optimization must be in sync to provide for efficient portfolio management (Cooper et al., 2004). This is different from the organizational integration layer, where the elements are mutually exclusive for the individual business opportunity, but all three of them should be possible in an organization (Aubry & Lavoie-Tremblay, 2018). Elements at the project governance layer should be integrated as they jointly govern project management idiosyncratically for a given project or program (Müller, 2009).

Between layer relationships

Following the notion that governance sets the framework for managers' decision making (OECD, 2001), the onion model shows a governance role of layers for their next inner counterpart. The most outer layer, organizational philosophy, governs the decisions by managers at the next inner layer on the questions of which, if at all, projects to take on, which

level of project management maturity through an OPMO to aim for, and how projectified the organization should be. The results of these decisions govern the management decisions on the next inner layer, which are concerned with the execution of the sum or groups of projects in the organization, such as the type of governance paradigm, governance model, or the governmentality approach to chose. Decisions at that layer govern decisions on the next layer regarding business integration, like the strategy, process and optimization of the project portfolio. Similarly, governance decisions at this level influence managers' decisions at the next layer in terms of how to integrate the selected opportunities from the portfolio in the organizational work, as project, program, or megaproject. Decisions here govern the choices at the project governance layer, such as methodologies, governance institutions and policies, which in itself governs the project/program management of the individual business opportunity.

Within and between layer interactions

To theorize on the interaction between elements and between layers we draw on two recent works. First, Simard et al's, (2018) framework for integration of governance, organizational design, and governmentality. It considers the formal and informal interactions between the projects and the parent organization across the levels of an organization. These interactions are explained through Dean's (2010) process of *visibility* (the visible objects necessary for the operation of an element, such as tables, charts etc.), *techne* (the means, mechanisms, procedures, practices etc. in place to perform the work), *episteme* (the logics applied in the organizations in decision making, which informs *techne*) and *identification* (forming and maintaining identities by actors in and for the different elements).

Second, we draw on Müller et al. (2017b) and Müller, Zhai, Wang, and Shao's (2016) work on the *governance precepts*, which are the predominant choices in communication content in governmentality, that is, the content in the interaction between a governing and a governed entity (such as between two layers). This applies in a similar manner to the layers in the OPM model.

Together these two theoretical approaches describe the interaction of layers and of elements through the concepts of visibility, *techne*, *episteme*, identification, and precept. Examples include the within-layer interaction of elements, such as the business integration layer. Here the nature of the organization's portfolio determines the *identification* of the actors (e.g. research managers or marketing managers), the portfolio strategy provides for the *episteme* (the logic for selection), which informs the portfolio management process and portfolio optimization technique used (*techne*), which in turn leads to a decision on and the *visibility* of a selected project. Visibility is enhanced by, for example, adding the selected project to the list of ongoing projects in the corporate ERP system. Through that the project as such becomes the "message" or content of the interaction with the next layer (i.e. the *precept*).

The interaction between layers is dominated by *precept* and *visibility*, where the former informs about the content of the "handover" in the interaction (e.g. a project with a specific name), whereas the latter provides for an index on the characteristics of the precept (e.g. a project rather than a program, as shown in the ERP system). Examples include the interaction of the business integration layer with the organizational integration layer. Here the related managers (*identification*) at the organizational integration layer pick up Project X (*precept*) as a valid business opportunity to pursue. The project's description in the ERP system (*visibility*) provides for the necessary details. The rest follows the within-layer interaction described above, whereby corporate logic (*episteme*) defines the setup of the organizational structure

(e.g. single steering groups projects, or complete program management organizations for programs), following the organizational processes and practices (*techne*), which produces *visibility* for the chosen project or program, and its name (or the names of the projects in a program) becoming the *precept* for the interaction with the next layer.

The above is a first attempt to theorize OPM in its entirety in organizations. For that, existing theories were integrated and extended to a more cohesive explanation of the interaction of OPM elements and their relationships.

Conclusions

The results of the conceptual and empirical work provide for a more holistic understanding of OPM and its implementation, beyond the traditional division of “3Ps”. A literature review identified the elements of OPM, whose mutual relationship were assessed into a seven-layer model. The relationships and interactions in the model were explained using contingency and other theories from existing studies on organizational design for OPM.

We can now answer the research question. OPM comprise of 22 individual elements (Figure 1), which mutually support each other and determine in their entirety the strength with which OPM operates in an organization. The elements are described in the related section of this article. The integration of the elements was shown through a seven-layer model, which hosts the elements in a logical cohesion at each layer and logical adhesion between layers. The interaction that allows for that was explained through a combination of contingency theory, the Simard et al., (2018) model for interaction in governance, and the Müller et al’s (2017b) concept of precept in governance related interactions. The combination of these views explains the functioning of the model, as well as the interaction within and between its layers.

The theoretical contribution of this paper lies in the comprehensive model of OPM, which helps in developing flexible organizations in changing hierarchical, network or hybrid structures that are becoming, rather than being (Simard et al., 2018). Moreover, the focus on elements and their expression in organizations allows to build a model for organizations in stable markets as well as those in constant change to adjust to their markets, as pointed out by Miterev et al. (2017c), by adjusting the expression (i.e. the strengths in being present) of elements. Finally, a theory on the interaction within and between the model layers was developed which helps to further understand corporate reality in terms of OPM implementations, and provides for better informed decisions on the development of future organizational design.

Practical implications are manifold and include a) an overview of the aspects of OPM (i.e. the elements) that should be considered by practitioners when implementing OPM; b) a tool to assess and gauge existing OPM implementations; as well as c) the use of the model for training and education programs to visualize and theorize OPM for managers and students in business and related areas.

Future studies may validate the model's construction empirically and subsequently test empirically the theorized interaction among elements and layers, using case studies and observations. Other studies may address the boundary conditions of the model from different perspectives, such as the organizational boundaries in larger corporations (how far is OPM stretched?), the business boundaries in small and medium size enterprises (how much OPM can the enterprise afford?), as well as the design contingencies for OPM implementation patterns. Yet other studies may address contingencies in OPM design in terms of isomorphism effects through copying of OPM designs between organizations (Miterev et al., 2017a) versus development of idiosyncratic designs in search for performance optimization.

The strengths of the study are in the identification and use of existing elements described in the academic literature, which are drawn together on a broader scale than in previous studies. A further strength lies in the use of existing theories to explain the model and its internal interaction. A theoretical model like the one discussed here has naturally a number risks and weaknesses. This includes general limitations of applicability stemming from the nature of these types of models and theories, which always simplify reality to make generic features visible, and thereby compromise “fit” to specific situations. Examples include the organizations that are outside of the range of those industries that were chosen in the original publications that helped to identify the OPM elements. Other limitations may stem from the subjectivity of the model developers and their, even though unintended, possible influence on the type of selected elements. Further limitations stem from the lack of empirical investigation of the interaction among elements and layers, which led to the use of existing theories to explain these interaction, even though their functioning may work differently. More research is therefore needed to test and refine the model in order to increase the understanding of it and the fit to a wide range of applications.

The study’s contribution to knowledge lies in the more holistic view towards OPM and a theory about the relationships and mechanisms within the model.

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