A Model for Organizational Project Management

Ralf Müller, BI Norwegian Business School, Oslo, Norway

Nathalie Drouin, University of Quebec at Montreal, KHEOPS Research Centre, Montreal, Canada

Shankar Sankaran, University of Technology Sydney, Australia

Authors

Professor Ralf Müller, *DBA*
BI Norwegian Business School
Sjöbogatan 10
212 28 Malmö, Sweden
E-mail: ralf.muller@bi.no

Professor Nathalie Drouin, *PhD*
University of Quebec at Montreal
School of Management
209, St-Catherine Street east, V-5305
Montreal, Quebec, H2X 1L2, Canada
E-mail: drouin.nathalie@uqam.ca

Professor Shankar Sankaran, *PhD, PMP*
University of Technology Sydney, Australia
School of the Built Environment
PO Box 123
Broadway, NSW 2007, Australia
E-mail: Shankar.Sankaran@uts.edu.au

Corresponding author:
Professor Ralf Müller, *DBA, MBA, PMP*
BI Norwegian Business School
Sjöbogatan 10
212 28 Malmö, Sweden
E-mail: ralf.muller@bi.no

A Model for Organizational Project Management

Abstract

The current discourse on organizational project management (OPM) focuses mainly on the integration of project, program and portfolio management, and ignores the contributions of other organizational entities and tasks to OPM. This paper overcomes this shortcoming by taking an organization theory perspective to develop and validate a seven layer "onion" model of elements that constitute OPM, their relationships, integration, and structural implementation in organizations. The particular combination of elements at each layer of the onion provides the necessary conditions for the adjacent layer of the model. The layers are organizational philosophy, OPM approaches, OPM governance, business integration, organizational integration, project governance, and project management. The model provides for an integrated view of OPM, assessment and profiling of OPM in organizations, and theorizes on the conditions for implementing OPM measures. Hence, the paper addresses the often articulated need for more theory in (organizational) project management.

Introduction

The concept of Organizational Project Management (OPM) developed from the emerging need to integrate the work of temporary organizations (such as projects) with the contributions from their permanent parent organization, in order to deliver project and organizational results efficiently and effectively (Turner & Müller, 2003). Early approaches to OPM revolved narrowly around the integration of projects, programs, and portfolios, with the practitioner literature emphasizing processual and policy approaches (Project Management Institute, 2003), whereas the academic literature emphasized structural approaches to meet the same objective, such as Aubry et al. (2007, p.332) who identified OPM as *a new sphere of management where dynamic structures in the firm are articulated as means to implement corporate objectives through projects in order to maximize value'*. Since then, the awareness has grown that OPM is much more than the "3Ps" of projects, programs and portfolios and that the implementation of OPM varies widely across organizations. Building on this understanding, the two steams of literature developed within their particular sphere, with the practitioner literature introducing the concept of principles to support processual implementations of OPM, where processes are understood as sequences of tasks (Project Management Institute, 2017). The academic literature emphasizes the continuous change in the organizational design and integration, where processes are seen as responses to unpredictable external trajectories requiring a resilient OPM implementation, which is able to adjust to situational contingencies and then bounce back to its equilibrium state in order to accomplish organizational strategies in a flexible way (Aubry & Lavoie-Tremblay, 2018). The present paper builds on and aligns with the latter stream of literature by defining OPM as *"The integration of all project management-related activities throughout the organizational hierarchy or network"* (Drouin et al. 2017). We extent this by adding other OPM related items, such as structures and organizational designs. Collectively we refer to them as *elements* of OPM. While many studies address OPM related elements, research beyond the 3Ps is sparse in terms of their integration into a cohesive model of OPM. This is addressed in the paper's research question:

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

The paper aims to broaden the perspective towards OPM by identifying and integrating those elements that are crucial for setting up OPM, but are either dealt with as separate topics in the literature (e.g. human resource management), or become almost invisible in the high abstract levels of existing models (Gemünden et al., 2018; Shenhar & Dvir, 2007). In this paper, the necessary elements of OPM are identified and conceptually investigated as to their interaction and dependency. This led 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 subsequent 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 hierarchy, network or hybrid of both in organizations, and provide a possible evolution framework for organizations.

The paper takes an organization and contingency theory perspective, assuming that organizational design implementations at all levels are contingent on their particular context (Donaldson, 2001). Practitioners will benefit from this paper by a developing a cohesive understanding of the types of OPM elements, their functions and interactions, which allows to identify possible frictions in OPM implementations and their avoidance. Academics will benefit from a model that integrates many elements that have so far been isolated topics, which nevertheless are important for OPM to function and to theorize upon.

The next section briefly describes the methodology and the layer-development process. For ease of understanding, the layer-development is described from the inside to the outside of the "onion". However, the categorization of OPM elements, their functions and organizational integration are described from the outside to inside, to allow for assessment of existing organizations, profiling them, and theorizing on their OPM implementation. The model is shown in Figure 1.

Methodology and layer development

The attempt to model OPM requires to a) identify the individual elements that make up OPM, and then b) identify the mutual strength of linkages between the elements in order to identify layers of impact, which may enable or constrain the behavior of individual elements, and c) model the relationships of the identified elements by taking into account the contextual influences from the higher layers of the model to the elements of the next lower layer, as well as d) validate the model empirically. For that we

a) Undertook a literature search in the management, organization, and governance literature to identify those organizational contributions to OPM that are intra-organizational, but external to individual projects. In line with existing conventions, we named these contributors OPM *elements*, which are defined as *"an essential or characteristic part of something abstract",* in this case the OPM model (Dictionary.com, 2018).
b) Identified linkages between elements and their strengths by starting from the individual project and selecting those identified elements that have the strongest linkage with the project. These constitute the next higher layer. That was followed by identifying the

group of related elements that strongly link with the layer identified before. This constituted the next layer. That was done until the list of identified elements was exhausted. Decisions on the strengths of linkages were, whenever possible, based on existing literature. This step resulted in the shape of the onion model.

c) Modelled the relationship between these elements, building on 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. This led to the logical relationships between the layers and their elements.

d) We validated the model by training representatives of 14 organizations for a subsequent self assessment of their organizations. The results were analyzed for the extent the model layers and elements were identified in practice, and possible implementation patterns found across organizations.

Validity and reliability was addressed at step a) by using ABS listed, established and relevant journals for element identification, at step b) by using grounded theory approaches of constant comparison of elements and their linkages with each other, then between element and layer, and between layers (Strauss & Corbin, 1990). At step c) we referred when possible 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.
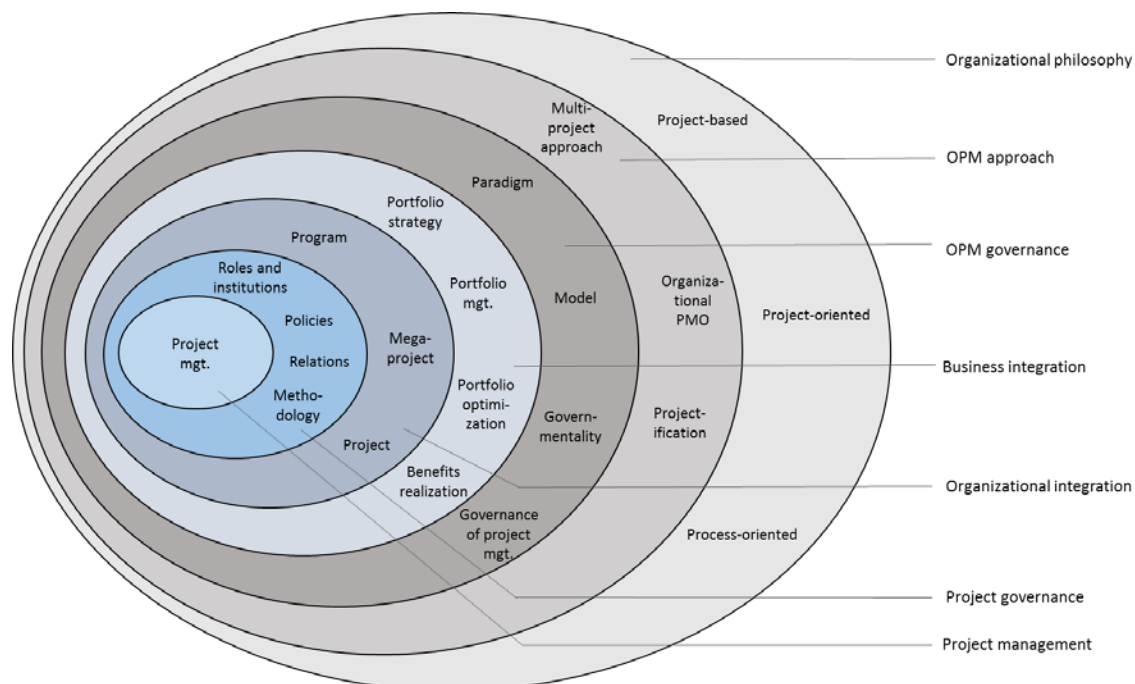

Figure 1: The onion model of OPM

Identification of elements

Elements are important, or at least continuously practiced, measures for the achievement of good organizational results through projects. Elements were mainly identified through analysis of subjects covered in the mainstream project management research journals. Elements identified beyond the 3Ps are described below and shown in Figure 1. They fall roughly into the categories of governance, PMOs, projectification, company-wide strategy and organization of projects.

Identification of layers

The point of departure was the individual project and its management. While the project is not part of further investigation in this paper, it is still the nucleus of activities in OPM. To conceptualize OPM from the individual project to the boundaries of its parent organization we classified OPM elements step-by-step for the strength of their mutual linkage. For example, from an OPM perspective the most direct linkage of a project with the rest of the organization is most likely its steering group, hence, its closest governance institution (Müller et al. 2017a). Thus, in line with the literature, project governance is identified as the closest OPM layer to the project. But project governance is not only exercised by the steering group, therefore there are further elements that constitute this layer. In the next section we will identify these elements, for example, as different governance institutions and their roles, the contracts that govern the relationships between the buyer, supplier, contractors and others, as well as the policies of the organization, and the agreed upon project management methodology as the interface between the governance layer and the project management layer. Each of these elements sets the condition for the execution of project management at the individual project level.

Using the same approach, the next layer is identified as project governance's (and with it project management's) embeddedness in the organization. Elements identified here relate to the form of organizational integration, such as projects (and their governance) being sovereign, autonomous entities in the organization which has a large impact on the choices made at the project governance level (Artto et al. 2008); or as part of a program and therefore dependent on the development of other projects in the program and only of limited ability to influence the governance choices (Maylor et al 2006). Or even a megaproject, which takes on characteristics of a firm, with a large number of sub-projects and suppliers, possibly aiming for maximizing value in deliveries over time for tax payers or shareholders (Flyvbjerg, 2014). The characteristics of the elements at this layer influences the choices on the next inner layer, the project governance layer.

Following this logic, the next layer addresses business integration. It has the strongest link to OPM integration as here the decisions are made on the mix of (mega)projects/programs to execute. This addresses the traditional elements of portfolio strategy, its management and optimization, as well as benefits realization (Killen & Drouin, 2017). This layer is governed – and therefore strongly linked with the OPM governance layer. OPM governance determines the governance paradigms for multi-project execution, the governance models which are provided for the organization to use, the governmentality approach (i.e. the leadership approach by those in governance roles), and the governance of project management (the

development of project managers and their capabilities) (Müller, 2009; 2017). This layer is then most directly linked with the organization-wide approaches to multi-project management, such as the multi-project approach chosen (Blomquist & Müller, 2006), the existence of strategic or corporate-wide PMOs (Aubry & Lavoie-Tremblay, 2017), and the level of projectification (Lundin et al., 2015). Here the former addresses the overall strategy in terms of handling the entirety of projects in the organization, and the latter 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.

This layer is then strongly linked by the organizational philosophy level, where decisions of the organizational model of either being project-based, project-oriented, or process oriented (Miterev et al. 2017; Söderlund, 2004) are made, which then strongly influences the way OPM is executed in the organization.

The seven layers exemplify the relationships between elements in terms of their cohesiveness (within a layer) and adhesiveness (between layers), with each new layer formed when the logical cohesiveness of a set of elements exceeds the logical adhesiveness to the next layer.

Modeling OPM

The model's layered structure was developed using an inside to outside approach (from the project to the organization's external boundary). This provided for a pragmatic and reliable development. However, the functioning of the model is better explained through an outside to inside approach. This is also suggested when assessing organizational practices against the model.

Organizational philosophy

This outer layer represents the most basic foundations for OPM in the organization. The underlying philosophy indicates the organization's understanding of their business and how they are going to legitimize their interaction in the marketplace.

Process-oriented organizations (ProcOO) run very few projects and their organizational structures are typically in functional lines and permanent organizations. This is beneficial in relatively stable markets, for mass-production, and building of economies of scale. These projects mainly aim to optimize production in terms of costs (Hobday, 2000).

Project-oriented organizations (POO) are typically found in more dynamic markets. They are project-oriented because management made a strategic choice to run the business by projects, even though it could also be run in a process-oriented manner (Turner, 2018). These organizations consider management by project as their strategy and use projects and programs as temporary organizations to deliver value to their clients. For that they empower employees, use flat organizations, and customer orientation to achieve competitive advantage. (Gareis & Huemann, 2007).

However, some organizations blend process and project-based approached. Studies found this form of organizing particularly in organizations between 250 and 1,000 employees, where the emphasis on cost reduction forces the organizations to interact with their customers by selling

and delivering *projects*, but once a project is signed by the customer, it is decomposed in its constituent parts and each part is independently entered in the permanently ongoing production process of the company. The project managers act as customer interface, internal lobbyists with the functional departments for the execution of the project related tasks, and assemblers of the final product for customer delivery. This approach reduces control costs, while customers feel to be treated as individuals who buy a bespoke product (Müller et al. 2016; Turner & Keegan, 1999).

Project-based organizations (PBO) are forced to work in projects, because the nature of their business demands it. Projects are their unit of production. This requires project specific control systems, which add additional costs to each project, which do not accrue in process-oriented organizations (Turner & Müller, 2003). One example of these additional structures is described as the Broker-Stewart Model by Turner and Keegan (2001).

Hobday (2000) models the different types of project organizations and concludes that the more project-oriented/based the organizational form, the more innovate and flexible are organizations in their response to customer requirements. However, with it 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, to what extent projects are seen as the 'normal' way of doing business in the organization.

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 shared nor are the objectives aligned across projects
b) Program strategy: organizations that prefer projects that contribute to higher objectives, such as program objectives. This often implies that resources cannot be shared across projects
c) Portfolio strategy: organizations prefer projects that predominantly use their existing employees. Hence, the resources are shared, but not necessarily the objectives across projects.
d) Hybrid strategy: organizations balance the program and portfolio approach to predominantly achieve both, existing resource utilization and accomplishment of higher level objectives.

A comparison of the approaches showed that the last approach is used by organizations with significantly higher success rates than those with other approaches.

PMOs are organizational bodies or entities that provide services for OPM (Roden et al., 2017). Organization-wide (a.k.a. strategic) PMOs aim for improvement of project management effectiveness, by developing or providing project management methodologies, policies, standards, and global reporting for the organization. By doing that, they set the corporate-wide project management culture. These should be distinguished from tactical PMOs, which appear at the project governance layer and are concerned with individual projects and their delivery (Müller et al., 2017b).

Projectification relates to the extent thinking in projects pervades the organization (Midler, 1995) or even society (Lundin et al., 2015). It is often measured along the dimensions of a) the importance of project management in the organization, b) the existence of career system or path, including training certification programs, for project managers, c) project use as business principle in relations with customers, d) the percentage of business based on projects, and e) a project mindset and culture by the employees. Higher levels on these measures indicate higher levels of projectification (Müller et al., 2017c).

Together the three OPM approach elements set the stage for the next layer in terms of a 'project culture' which implicitly gives direction in OPM governance.

OPM governance

This represents the governance layer for groups of projects, programs and portfolios of projects. The elements of this layer are strongly influenced by the OPM approach layer. Examples include the existence of organization-wide PMOs and higher levels of projectification at the OPM approach layer, which influences the ability to govern project management in terms of capability to develop project managers, and determine "how much project management is enough" in day-to-day work. Similarly provide program, portfolio or hybrid approaches to the multi-project business for more outcome-oriented governance paradigms for projects.

Governance paradigms are thinking patterns in terms of how groups of projects should be governed. Four paradigms are often found, which represent the governing institution's (e.g. steering committee's) expectation of how the project should be managed. By identifying the corporate governance approach as either shareholder-oriented or stakeholder-oriented, and identifying whether the project manager is primarily controlled by achievement of project results or by following the process, four governance paradigms emerge, see Figure 2. Each of them describes the range within which project management is expected to be done (Müller & Lecoeuvre, 2014).

Governance models refer to the guidelines and standards used for governance of groups of projects. Prescriptive (a.k.a. rule based) and non-prescriptive models exist. The former includes models that provide detailed processes and activities for governance (e.g. PMI, 2016), while the latter provide principles of good governance, without determining the work or its processes (e.g. APM, 2004). A blended model is found in the ISO 21505:2017 Standard, which provides guidance on governance elements, processes, institutions, but also emphasizes the need to take forward the organizational values, policies, statutory and more principle-based approaches (ISO, 2017).

		Governance Orientation	
		Shareholder Orientation	*Stakeholder Orientation*
Control focus	*Outcome*	Flexible Economist	Versatile Artist
	Behavior	Conformist	Agile Pragmatist

Figure 2: Governance paradigms (Müller & Lecoeuvre, 2014)

Governmentality is a combination of the words Governance and Mentality. It 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). Dean (2010) classified this in three approaches: a) authoritative, which emphasizes process compliance and rigid control structures, b) liberal governmentality, which often uses economic means to steer the decision making of those who are governed, and c) neo-liberal governmentality, which sets a particular context for the governed to influence their decision making (Müller et al., 2017c).

Governance of project management relates to the governance of the project management capabilities and practices in the organization. It addresses questions like "how much governance is enough for the organization?", or "how senior shall our project manager be?". A related framework identifies three steps in this governance (Figure 3): which are a) step 1 - basic: organizations using project methodologies, steering committees, and audits of troubled projects; b) step 2 - intermediate: organizations using all of the basic level plus project manager certification, PMOs, and mentor programs, and c) step 3 - advanced: 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. (Müller, 2009).

This layer defines the different aspects of governance of groups of projects and project management. This sets the stage for the integration of these groups with each other from a business perspective.

Figure 3: Governance of project management framework (Müller, 2009)

Business integration

The above layer governs the management of groups of projects, predominantly portfolios (which are groupings of projects to facilitate their effective management). More process-oriented paradigms and models will foster a related approach to portfolio management, hence control by process-compliance, usually paired with a strong numbers orientation. In contrast, more outcome related governance paradigms, more principles-based governance, and more 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).

Portfolio strategy defines what the project portfolio is expected to achieve (Voss, 2012). Portfolio strategy guides the day-to-day portfolio management and should be strongly linked with the strategic objectives of the organization (Jugdev, 2017). Examples include strategies to maximize profit, or expand presence to new countries, achieving a certain market share etc.

This is interlinked with portfolio management, 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). It refers to 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 (Project Management Institute, 2006). This has a major impact on the achievement of the organization's strategic objectives (Kopmann et al., 2017). Depending on the expectations laid out by the OPM governance level (Unger et al, 2012), and the particular context and situation of the organization, more rational and process related approaches or more subjective and outcome/political approaches to portfolio management might be pursued (Martinsuo, 2012).

Interlinked with portfolio strategy and management 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, which are either used alone or in combination with each other:

- Value Maximization: Projects must reach a certain threshold value, typically of financial nature, like Return on Investment (ROI) or Net Present Value (NPV). The approach is criticized as being too numbers-driven and not allowing for more qualitative benefits of projects. Corporations using this as a standalone approach perform badly in their industry.
- Balancing: Similar to an investment fund, this approach builds on the mutual cancellation of risks in a group of projects. Projects are selected into the portfolio based on a balanced weighted measure of a number of parameters, like level and nature of risk, duration, technological newness etc. This approach is criticized for lack of guidance on the balancing parameters and weighting criteria. Corporations using this as a standalone approach are typically more successful than those using Value Maximization as a standalone strategy.
- Strategic Alignment: Here 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". This approach is criticized for being too hypothetical and far out in the future. However, corporations using this as a standalone strategy are among the most successful in their industry.

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

The last element of this layer addresses the management of the benefits realized by projects and programs in the portfolio. This is often referred to as benefits realization management, which is a process to ensure the most appropriate projects are selected, these projects are shaped and scoped to optimize their alignment with business needs, ensuring they deliver potential benefits, and measuring the benefits delivered to demonstrate success (Bradley, 2014). To that end, it is strongly linked with portfolio strategy, management, and optimization. However, it is also separate from it, as it does not only address the question of what is best for the parent organization of the portfolio, but also what is best for the receiver of the projects. Hence, it addresses the longer-term objectives of the organizations that mutually engage within a project. Despite its obvious advantages, it is not frequently used in the industry. Bradley (2014) reports that less than 40% of organizations effectively measure the benefits delivered by their project and programs. Those which do, report that only about 20% of the planned benefits are realized. This indicates weaknesses in setting the initial target benefits. Zwikael, Chih and Meredith (2018 p.650) suggest to overcome these weaknesses by use of a three dimensional measurement scale for benefits, comprising of "specificity (e.g., specific target values), attainability (e.g., the capacity to realize the target benefits), and comprehensiveness (e.g., reflect the views of key stakeholders).

Benefits realization management is often described as starting long before a project or program is launched, such as for the Öresund bridge which connects Denmark and Sweden, whose benefits were discussed decades before the decision was made by politicians to build

it. Based on the expected benefits the project was launched. Its economic impact (i.e. the benefit) is measured as increase in GDP in the geographic region, in 10 years' intervals after the bridge is put in use.

This layer has identified the most appropriate projects and programs through balancing selection criteria, such as resources, business goals and benefits over different time periods and from different perspectives. This impacts the way organizations go about creating these benefits.

Organizational integration

The above layer identified the opportunities most beneficial for the organization (and potentially its customers). The present layer addresses the ways these opportunities are integrated in form of temporary organizations in the workflow of the organization. In other words, how the business opportunities are fitted in the workflow of the organization. For example, decisions made on the business integration layer to launch a new product line, such as a new model by an automobile manufacturer, will most likely lead to program approaches at the organizational integration layer, 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. Contrarily, decisions made on the further development of existing products, or new technology or product prototypes, will most likely lead to one-time endeavors in form of singular projects. In cases where the investment is very large, such as in megaprojects, and potentially shared with other firms and the public sector, it is likely that specific legal entities are created, known as 'Special Purpose Entities' (SPEs). These can take on the form of separate firms, or a nexus of contracts among organizations involved in the megaproject. SPEs operate in three domains: a) the legal domain, where they either represent an intentional off-balance sheet instrument, which is used to hive off specific businesses from the originator or to establish legitimacy in a jurisdiction that is 'friendly' towards the project; b) the financial domain, where the "SPE is a financial vehicle that permits four main types of transactions: securitization, project finance transactions, leasing transactions, and leverage buyouts"; and c) the project management domain, where "SPEs are legal organizations devoted exclusively to performing their contracts, which pre-define their purposes". The main use of these entities is for project financing and partnering using different contract types. The setup and maintenance of SPEs is expensive and therefore mainly used in megaprojects (Sainati et al., 2017, p.60).

Programs

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 a defined end date, such as a series of software projects ending in a new Enterprise Resource Planning System, implemented over a defined timeframe, 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). Programs may define an organization's day-to-day business,

such as in the case of an automobile manufacturer. Management of programs is often related to the goals set by the business integration layer in terms of aligning the program with the strategy and the management of benefits. In addition, it is concerned with engaging stakeholders, governance of the projects in the program, and management of the life-cycle of the program.

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 durations of several years. Despite the difficulties of planning them realistically, because of their complexity, megaprojects are increasingly popular worldwide (Flyvbjerg, 2011). The popularity is traced back to four sublimes: a) technological, stemming from the excitement of technologists, b) political, because of the visibility it creates for the politicians launching them, c) economic, the attractiveness for business people to make money with and through them, d) aesthetics, the pleasure of designers in building icons and of people looking at them (Flyvbjerg, 2014).

Projects are temporary organizations to deliver clearly identifiable outcomes within the limits of time and cost budgets (Atkinson, 1999; Lundin & Söderholm, 1995). Projects provide for three levels of results: first, the output at the project level, typically a new product, service or organization which provides the investor with new or improved competencies or marketing opportunities; secondly, the operation of the output will typically payback the investment, and third, over time, the output will turn into outcome through the achievement of the business expectations which triggered the project's launch, and with it the strategic objectives of the organization (Turner, 2014).

This layer described the ways project related work is integrated in the organization and laid the foundation for the governance of these individual projects identified by now.

Project governance

The organizational integration layer described above identified the organizational means to address the business and strategy objectives identified at the business integration layer. At the present layer of project governance, the individual (mega)-projects and the projects in the programs are governed.

Governance sets the limitations within which managers execute their tasks and are held accountable for it (OECD, 2004). Governance structures should be built on four principles: achieving transparency, accountability, responsibility and fairness (Millstein, et al., 1998). The three most basic governance tasks are to provide structures for defining the goals of the project, for providing the resources to execute the project, and for controlling its progress. Governance structures often include governance institutions, like project steering committees or PMOs, contracts between organization participating in the project, policies for the organizations executing the project, as well as an agreement on the type of process used to manage the project, that is, the project management methodology (Turner, 2014).

The elements of this layer adjust to the requirements set by the choices made at the organizational integration layer. For example, if the chosen mode of organizational integration is through a program, then the governance of the projects requires standardization

of reporting requirements and most likely synchronize project management methodologies across all projects in the program, contract strategies that synchronize across the projects, and steering committees that involve the program manager. If the choice of organizational integration is the project, then reporting requirements, methodology and contract decisions, are more individualized for the project, but of course within the constraints of corporate practices and standards. In case of megaprojects yet another mix applies, as large numbers of both suppliers and stakeholders with very different objectives must be integrated, which requires hierarchies of contracts, many governance institutions, respecting industry and public policies alike and the integration of several, or development of specific project management methodologies.

Project governance institutions are predominantly steering groups and tactical PMOs. The former consists 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 (Office of Government Commerce, 2009). The committees execute their basic 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; Turner, 2014).

Tactical project management offices 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, et al., 2014; 2016). Implementations of PMOs are idiosyncratic for organizations, and vary considerably. Their mandates are often aligned with particular areas for improvement in organizational project management. While typically being successful in addressing these problems, their mandates change frequently and with it the skills required to fulfill these mandates. Hence the PMO staff changes frequently (Aubry et al. 2012). Depending on the industry many more governance institutions can emerge, such as safety and quality committees, for example in construction, or regulatory institutions for public health in the pharma industry.

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.

Relations between parties involved in a project are governed by formal contracts or through informal relationships. While an internal project within an organization is likely to be governed by the informal relationship between sponsor and project manager, a project that requires independent companies to collaborate will most likely be governed by the contract(s) between the parties. Contracts are sets of promises between the parties, which the law will enforce" (Dingle et al., 1995, p.244). It provides the legal framework for the parties in the project to execute their roles and responsibilities. It also regulates the distribution of risks, such as financial risks in fixed-price contracts being mainly on the side of the selling

organization, and the opposite in time-and-material contracts. Depending on who controls the risk, different types of contracts are chosen, such as behavior-based contracts when buyers control the risk, and outcome-based when suppliers control the risk (Müller & Turner, 2005; Turner, 2004).

The project management methodology is the agreed upon way to manage the project. Several types of methodologies exist, the most popular is to distinguish them in so-called waterfall methodologies, which provide the traditional process of upfront planning and life-cycle stages, which are concept, planning, implementation & control, close-out of the project, separated by stage-gates. This is different from more contemporary and so-called agile methods, which are more iterative in their process and requires less upfront planning. Choices on methodologies depend on project type, contract type and the extent the project's product is understood by the time the project is launched. The project management methodology constitutes the interface between project governance and management. It is looked at by 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. (Office of Government Commerce, 2008)

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

Project management

This constitutes the kernel of the onion, hence the management of the individual project, including life-cycle management, risk and change management, planning and control, as well as the team with its integrating role between the project and the project manager. The activities of the project manager are framed by the governance layer. Within this framework the time, cost and quality objectives are typically used to judge on project management success at the end of the project. The accomplishment 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.

Model validation

The OPM model was validated through a random sample of organizations in a Western European country. For that, 14 part-time students of an Executive Master program at a Business School were trained in the model for three days and subsequently asked to assess their organizations against the OPM model. The goal of this exercise was to identify the presence and expression of the different elements, as well as their integration in the organizations. Variety sampling was used to identify the most basic patterns of the phenomenon. The organizations came from a diverse set of industries, including healthcare, engineering, shipbuilding, and merchandizing. Their size spanned from as small as 10 to as large as 58,000 employees. Students (mostly managers) assessed their respective organization either through self-assessment or by interviewing up to 5 managers of the organization. Appendix A shows the tools used for the assessment of the elements.

Eight of the firms were process-oriented organizations (ProcOO), focusing on production. However, they had between three and 20 projects each year to improve manufacturing capabilities and quality. Three companies were project-oriented (POO), and three project-based organizations (PBO). Their integration of the two outer layers is shown in Figure 4. Both ProcOOs and POOs pursue hybrid approaches to their multi-project business, so they try to accept only projects that balance usage of their own resources and contributions to higher level goals. Multi-project driven organizations accept whatever project they can get. They are found across all organizational philosophies. Some ProcOOs select their projects by prioritizing internal resource usage (i.e. portfolio-driven), while some PBOs are program driven, by selecting their projects depending on their contribution to higher level goals, which cannot be achieved with one project.
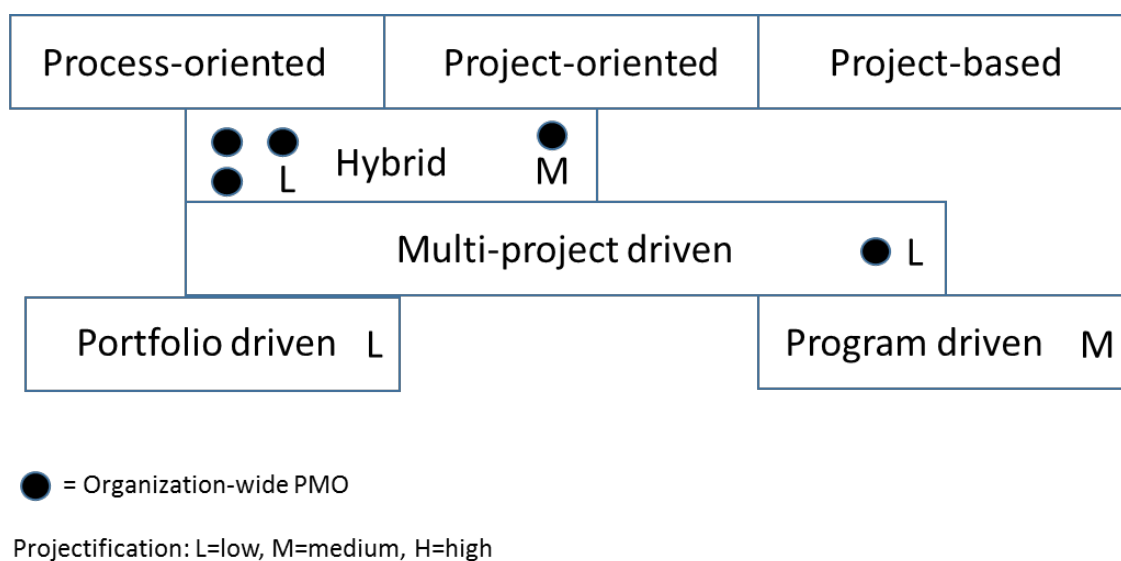

Figure 4: Integration of organizational philosophy and OPM approach layer

Organization-wide PMOs are found mainly in ProcOOs which pursue a hybrid approach to their multi-project business and have a low level of projectification in the organization. They aim for improvement of their project management capabilities through the PMO, as indicated by the one organization which moved from ProcOO to POO and improved their projectification from low to medium by using a PMO. A similar approach is taken by one of the multi-project driven PBO organizations with a low level of projectification.

Further analysis of the data indicated a pivotal role of the organization-wide PMO (OPMO). As depicted in Figure 5, organizations with an OPMO show high levels of similarity in their OPM implementation across layers. For example, they all apply the same governance paradigm for their project business, that of the Versatile Artist, which indicates that the organization is stakeholder-oriented (as opposed to shareholder oriented) and controls project managers by their results (as opposed to process compliance). Similarities are also shown in the further integration of OPM layers. Preference is given to liberal and neo-liberal governmentality. Governance of Project Management is stronger expressed than in any other paradigm. Strict processes for portfolio management are enforced to identify the best projects

for strategy implementation and cost reduction. The selected opportunities are implemented using program and project approaches, and the project methodology is chosen as traditional waterfall or agile depending on the characteristics of the project. In summary, OPMOs seem to homogenize OPM implementation across organizations. By way of doing this they simultaneously empower project managers and enforce organizational processes for portfolio management.

Organizations without an OPMO, show a diversity of governance paradigms and approaches to OPM integration. The one organization with a Flexible Economist paradigm (shareholder orientation and control of project managers by their outcome) applies neo-liberal governmentality and governs its project management using methodology, audits, and steering committees. Projects are selected in accordance with the strategy and implemented using both programs and projects. Freedom is given to the project manager to chose the methodology, while a preference is for traditional waterfall approaches.

The two organizations which use an Agile Pragmatist paradigm (stakeholder orientation and behavior control of the project manager) apply liberal approaches to governmentality, thus build on the rational and economic decision making by the project manager. Portfolio management is not strongly used, as both organizations accept almost all possible projects with their clients to maximize profits. Deliverables are created using individual projects and a SCRUM methodology.

Organizations pursuing a Conformist paradigm (shareholder orientation and behavior control) apply both authoritarian and liberal approaches to governmentality, and portfolio management is done by identifying "must win" projects, which are seen as strategically important. Implementation is done through programs and projects, typically using traditional waterfall methods.
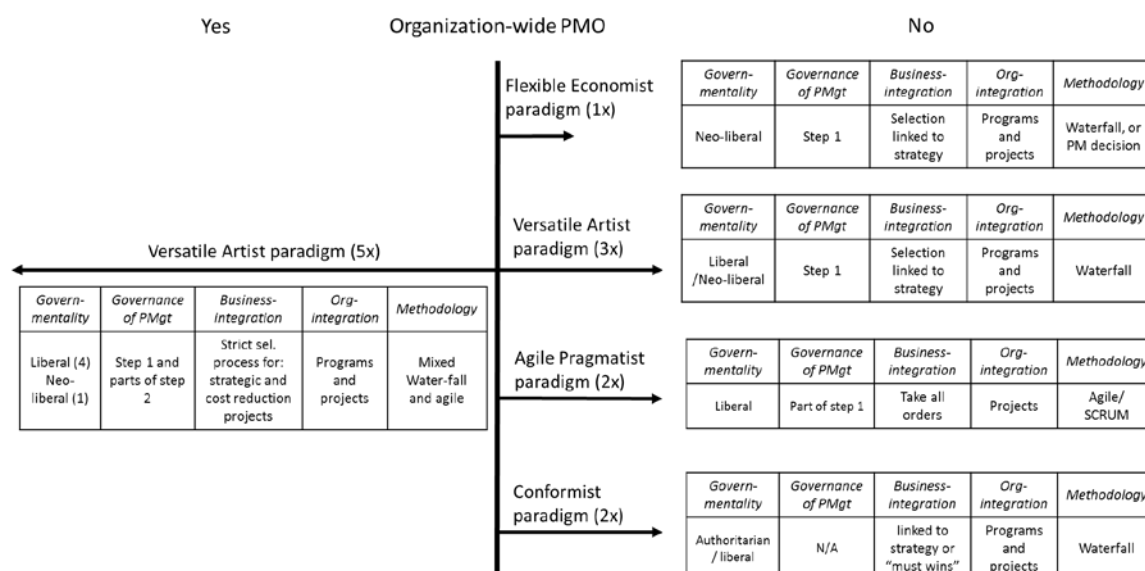

Figure 5: Patterns of OPM implementation

The findings across the 14 organizations validate the model, as all elements were identified and the results indicate clear patterns of implementation for which the OPMO element appears to be play a decisive role.

Conclusions

In this study we identified, modelled, and validated the OPM related elements and their relationship. A seven layer 'onion' model derived from an identification of OPM elements from the literature and assessing them for their interdependence (i.e. cohesiveness) for a particular layer, and impact (adhesiveness) from neighboring layers. 22 OPM elements were grouped in seven layers (Figure 1).

The results show OPM more holistically, beyond the traditional division of "3Ps". It starts with the organization's way to deliver value in the marketplace, the organizational philosophy, which strongly links with OPM approaches. Here even ProcOOs develop their project management capabilities by implementing PMOs and other measures to improve project results. POOs and PBOs do the same, but typically at higher levels of projectification. The latter highlights the role of HR, training, and marketing departments in OPM, a set of departments rarely associated with OPM implementations.

This links with OPM governance, where paradigms, models, governmentality and governance of project management integrate into a cohesive governance layer which connects the project part of the business with corporate governance and OPM approaches. This governance layer sets the stage for portfolio management (addressing what can be done in and with the organization) by defining the portfolio's strategy, management process, optimization goals and ways to manage benefits realization. This sets the stage for organizational integration, which defines how the work is implemented, either through projects, programs or megaprojects. This, in turn, sets the stage for the governance of the individual project in terms of their governance institutions and their roles, the contracts or relationships between the parties, the policies and methodologies.

The theoretical contribution of this paper lies in the comprehensive model of OPM, which an be used in future studies for further validation and theory development. Other future studies may include investigations of the interaction among elements within, as well as outside the onion, such as the elements role in stakeholder management. Practical contributions are in the 'onion' and the OPM patterns as a blueprint for setting-up or implementing OPM in organizations. Furthermore, for the development of training curricula and consulting engagements.

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. The weaknesses are in the mainly theoretical basis for the development of the model and the limited test with 14 organizations. More research is therefore needed to test and refine the model. Here qualitative studies will allow to identify the linkages between elements in more details. Once the model has been tested and refined through these studies, it should be tested quantitatively on a global scale.

The study's contribution to knowledge lies in the more holistic view towards OPM and the first understanding of implementation patterns and their influential factors across organizations.

References

APM. (2004). *Directing Change: A guide to governance of project management*. High Wycombe, UK: Association for Project Management.

Artto, K., Kujala, J., Dietrich, P., & Martinsuo, M. (2008). What is project strategy? *International Journal of Project Management*, *26*(1), 4–12. https://doi.org/10.1016/j.ijproman.2007.07.006

Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management*, *17*(6), 337–342. https://doi.org/10.1016/S0263-7863(98)00069-6

Aubry, M., & Lavoie-Tremblay, M. (2017). Organizing for the management of projects: The Project Management Office in the dynamics of organizational design. In S. Sankaran, R. Müller, & N. Drouin (Eds.), *The Cambridge Handbook of Organizational Project Management* (pp. 119–133). Cambridge, UK: Cambridge University Press.

Aubry, M., & Lavoie-Tremblay, M. (2018). Rethinking organizational design for managing multiple projects. *International Journal of Project Management*, *36*(1), 12–26. https://doi.org/10.1016/j.ijproman.2017.05.012

Aubry, M., Müller, R., & Glückler, J. (2012). *Governance and Communities of PMOs*. Newtown Square, PA, USA: Project Management Institute,USA.

Barthes, R. (2013). *Mythologies*. New York, NY: Hill & Wang.

Blomquist, T., & Müller, R. (2006). *Middle Managers in Program and Portfolio Management: Practice, Roles and Responsibilities*. Newton Square, USA: Project Management Institute.

Bradley, G. (2014). Benefits Realization Mnagement. In R. Turner (Ed.), *Gower Handbook of Project Management* (5th ed., pp. 123–137). Farnham, Surrey, UK: Gower Publishing Limited.

Cooke-Davies, T. J. (2002). The "real" success factors on projects. *International Journal of Project Management*, *20*(3), 185–190. https://doi.org/10.1016/S0263-7863(01)00067-9

Cooper, R. G., Edgett, S. J., & Kleinschmidt, E. J. (2004). Benchmarking Best NPD Practices - III. *Research Technology Management*, *2004*(November-December), 43–55.

Crawford, L., Cooke-Davies, T., Hobbs, B., Labuschagne, L., Remington, K., & Chen, P. (2008). Governance and Support in the Sponsoring of Projects and Programs. *Project Management Journal*, *39*(Supplement), S43–S55.

Dean, M. (2010). *Governmentality: Power and Rule in Modern Society* (2nd ed.). London, UK: SAGE Publications Ltd.

Dingle, J., Topping, D., & Watkinson, M. (1995). Procurement and contract strategy. In R. Turner (Ed.), *The Commercial Project Manager* (pp. 243–267). Maidenhead, UK: McGraw-Hill, England.

Donaldson, L. (2001). *The Contingency Theory of Organizations*. Thousand oaks, CA, USA: SAGE Publications.

Drouin, N., Müller, R., & Sankaran, S. (2017). The Nature of Organizational Project Management through the Lens of Integration. In S. Sankaran, R. Müller, & N. Drouin (Eds.), *Cambridge Handbook of Organizational Project Management* (pp. 9–18). Cambridge, UK: Cambridge University Press.

Flyvbjerg, B. (2011). Over Budget, Over Time, Over and Over Again. In P. W. G. Morris, J.

K. Pinto, & J. Söderlund (Eds.), *Oxford Handbook of Project Management* (pp. 321–344). Oxford, UK: Oxford University Press, UK.

Flyvbjerg, B. (2014). What You Should Know About Megaprojects and Why : An Overview. *Project Management Journal*, *45*(2), 6–19. https://doi.org/10.1002/pmj

Gareis, R., & Huemann, M. (2007). Maturity Models for the Project-oriented Comapny. In J. R. Turner (Ed.), *Gower Handbook of Project Management* (4th ed., pp. 183–208). Aldershot, UK: Gower Publishing Ltd.

Gemünden, H. G., Lehner, P., & Kock, A. (2018). The project-oriented organization and its contribution to innovation. *International Journal of Project Management*, *36*(1), 147–160. https://doi.org/10.1016/j.ijproman.2017.07.009

Hobbs, B., & Aubry, M. (2007). A Multi-Phase Research Program Investigating Project Management Offices (PMOs): The Results of Phase 1. *Project Management Journal*, *38*(1), 74–86.

Hobday, M. (2000). The project-based organisation : an ideal form for managing complex products and systems ? *Research Policy*, *29*(2000), 871–893.

ISO. (2017). *Project, programme and portfolio management - Guidance on governance*. Geneva, Switzerland: ISO Copyright Office.

Johns, G. (2006). The essential impact of content on organizational behavior. *Academy of Management Review*, *31*(2), 386–408. https://doi.org/10.5465/AMR.2006.20208687

Jugdev, K. (2017). Strengthening the connection between strategy and organizational project management. In S. Sankaran, R. Müller, & N. Drouin (Eds.), *Cambridge Handbook of Organizational Project Management* (pp. 44–54). Cambridge; MA, USA: Cambridge University Press.

Killen, C. P., & Drouin, N. (2017). Project portfolio management. In S. Sankaran, R. Müller, & N. Drouin (Eds.), *Cambridge Handbook of Organizational Project Management* (pp. 55–69). Cambridge; MA, USA: Cambridge University Press.

Kopmann, J., Kock, A., & Killen, C. P. (2017). Project portfolio management. In S. Sankaran, R. Müller, & N. Drouin (Eds.), *Cambridge Handbook of Organizational Project Management*. Cambridge; MA, USA: Cambridge University Press.

Lundin, R. A., Arvidsson, N., Brady, T., Ekstedt, E., C, M., & Sydow, J. (2015). *Managing and Working in Project Society*. Cambridge, UK: Cambridge University Press.

Lundin, R. A., & Söderholm, A. (1995). A theory of the temporary organization. *Scandinavian Journal of Management*, *11*(4), 437–455.

Mantel, S. J., Meredith, J. R., Shafer, S. M., & Sutton, M. M. (2008). *Project Management in Practice* (3rd ed.). John Wiley & Sons.

Maylor, H., Brady, T., Cooke-Davies, T., & Hodgson, D. (2006). From projectification to programmification. *International Journal of Project Management*, *24*(8), 663–674.

Midler, C. (1995). "Projectification" of the firm: The Renault Case. *Scandinavian Journal of Management*, *11*(4), 363–375.

Miia Martinsuo. (2012). Project portfolio management in practice and in context. *International Journal of Project Management*, *31*(2), 794–803.

Millstein, I. M., Albert, M., Cadbury, A., Feddersen, D., & Tateisi, N. (1998). *Improving Competitiveness and Access to Capital in Global Markets*. Paris, France: OECD Publications.

Miterev, M., Mancini, M., & Turner, R. (2017). Towards a design for the project-based organization. *International Journal of Project Management*. https://doi.org/10.1016/j.ijproman.2016.12.007

Mowday, R. T., & Sutton, R. I. (1993). Organizational behavior: Linking individuals and groups to organizational con- texts. *Annual Review of Psychology*, *44*, 195–229.

Müller, R. (2009). *Project Governance*. Farnham, UK: Gower Publishing Ltd.

Müller, R. (2017). *Governance and Governmentality for Projects: Enablers, practices and consequences*. (R. Müller, Ed.). New York, NY, USA: Routledge, USA.

Müller, R., Andersen, E. S., Klakegg, O. J., & Volden, G. H. (2017a). Governance institutions. In R. Müller (Ed.), *Governance and Governmentality for Projects: Enablers, Practices, and Consequences* (pp. 51–66). New York, NY, USA: Routledge, USA. https://doi.org/10.4324/9781315683294

Müller, R., Andersen, E. S., Klakegg, O. J., & Volden, G. H. (2017b). Governance Institutions. In R. Müller (Ed.), *Governance and Governmentality for Projects: Enablers, practices and consequences* (pp. 51–66). New York, NY: Routledge.

Müller, R., & Lecoeuvre, L. (2014). Operationalizing governance categories of projects. *International Journal of Project Management*, *32*(8). https://doi.org/10.1016/j.ijproman.2014.04.005

Müller, R., & Lecoeuvre, L. (2014). Operationalizing Governance Categories of Projects. *International Journal of Project Management*, *32*(8), 1346–1357. https://doi.org/dx.doi.org/10.1016/ j.ijproman.2014.04.005

Müller, R., Shao, J., & Pemsel, S. (2016). *Organizational Enablers for Project Governance*. Newtown Square, PA, USA: Project Management Institute, USA. Retrieved from http://marketplace.pmi.org/Pages/ProductDetail.aspx?GMProduct=00101589201

Müller, R., & Stawicki, J. (2006). A Framework for Building Successful Project-Based Organizations. In *Proccedings of the 20 IPMA World Conference on Project Management, October 16-17, 2006, Shanghai, China*.

Müller, R., & Turner, J. R. (2005). The impact of principal-agent relationship and contract type on communication between project owner and manager. *International Journal of Project Management*, *23*(5 SPEC. ISS.). https://doi.org/10.1016/j.ijproman.2005.03.001

Müller, R., Zhai, L., & Wang, A. (2017c). Governance and governmentality in projects: Profiles and relationships with success. *International Journal of Project Management*, *35*(3). https://doi.org/10.1016/j.ijproman.2017.01.007

OECD Publishing. (2004). *OECD Principles of Corporate Governance 2004*. Paris: OECD Publishing. https://doi.org/10.1787/9789264015999-en

Office of Government Commerce. (2008). OGC Governance. Retrieved from http://www.ogc.gov.uk

Office of Government Commerce. (2009). *Directing Successful Projects with Prince2*. London, UK: TSO.

Pemsel, S., Müller, R., & Söderlund, J. (2016). Knowledge Governance Strategies in Project-based Organizations. *Long Range Planning*, *49*(6). https://doi.org/10.1016/j.lrp.2016.01.001

Pemsel, S., Wiewiora, A., Müller, R., Aubry, M., & Brown, K. (2014). A conceptualization of knowledge governance in project-based organizations. *International Journal of Project Management*, *32*(8), 1411–1422.

PMI. (2016). *Governance of Portfolios, Programs, and Projects: A Practice Guide*. Newtown Square, PA, USA: Project Management Institute, USA. Retrieved from http://www.pmi.org/~/media/PDF/learning/portfolio-program-project-governance-practice-guide.ashx

Project Management Institute. (2003). *Organizational Project Management Maturity Model: Knowledge Foundation*. Newtown Square, USA: Project Management Institute.

Project Management Institute. (2017). *Standard for Organizational Project Management (OPM): Exposure Draft*. Newtown Square, PA, USA: PMI.

Roden, E., Joslin, R., & Müller, R. (2017). *PMO Principles*. Wollerau, Switzerland: IPMO Advisory AG.

Sainati, T., Brookes, N., & Locatelli, G. (2017). Special Purpose Entities in Megaprojects:

Empty Boxes or Real Companies? *Project Management Journal*, *48*(2), 55–73. Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=122103748&site=eh ost-live

Sharifi, M. M., & Safari, M. (2016). Application of Net Cash Flow at Risk in Project Portfolio Selection. *Project Management Journal*, *47*(4), 68–78.

Shenhar, A. J., & Dvir, D. (2007). *Reinventing project management: the diamond approach to successful growth and innovation*. Harvard Business School Press; USA.

Söderlund, J. (2004). On the broadening scope of the research on projects: a review and a model for analysis. *International Journal of Project Management, 22*(8), 655–667.

Strauss, A. L., & Corbin, J. M. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Beverly Hills, California: SAGE Publications.

Turner, J. R. (2004). Farsighted project contract management: incomplete in its entirety. *Construction Management and Economics*, *22*(1), 75–83.

Turner, J. R. (2018). The management of the project-based organization: A personal reflection. *International Journal of Project Management*, *36*(1), 231–240. https://doi.org/10.1016/j.ijproman.2017.08.002

Turner, J. R., & Keegan, A. (1999). The Versatile Project-based Organization: Governance and Operational Control. *European Management Journal*, *17*(3), 296–309.

Turner, J. R., & Keegan, A. (2001a). Mechanisms of Governance in the Project-Based Organisation: a Transaction Cost Perspective. *Henley Working Paper Series*, *HWP 0104*.

Turner, J. R., & Keegan, A. (2001b). Mechanisms of governance in the project-based organization: Roles of the broker and steward. *European Management Journal*, *19*(3), 254–267. https://doi.org/10.1016/S0263-2373(01)00022-6

Turner, J. R., & Müller, R. (2003). On the nature of the project as a temporary organization. *International Journal of Project Management*, *21*(1), 1–7.

Turner, R. (2014). Projects and Their Management. In R. Turner (Ed.), *Gower Handbook of Project Management* (5th ed., pp. 19–34). Farnham, Surrey, UK: Gower Publishing Ltd.

Unger, B. N., Gemünden, H. G., & Aubry, M. (2012). The three roles of a project portfolio management office: Their impact on portfolio management execution and success. *International Journal of Project Management*, *30*(5), 608–620. https://doi.org/10.1016/j.ijproman.2012.01.015

Voss, M. (2012). Impact of customer integration on project portfolio management and its success-Developing a conceptual framework. *International Journal of Project Management*, *30*(5), 567–581. https://doi.org/10.1016/j.ijproman.2012.01.017

Zwikael, O., Chih, Y., & Meredith, J. R. (2018). Project benefit management: Setting effective target benefits. *International Journal of Project Management*, *36*(4), 650–658.

Appendix: Assessment tools and their references

Layer	Element	Assessment model reference	Question/reference	Results
Organizational philosophy	Project-based Project-oriented Process-oriented	(Turner & Keegan, 2001a) (Gareis & Huemann, 2007) Dto.	Discussion of characteristics	3 organizations 3 organizations 8 organizations
OPM approach	Multi-project approach O-PMO Projectification	(Blomquist & Müller, 2006) (Müller et al., 2017b) (Müller, Zhai, et al., 2017)	p.85-98 p. 54-58 p. 391	4 multi-project, 7 hybrid, 1 ptf, 1 pgm 5 organizations 6 low, 3 medium, 1 high
OPM governance	Paradigm Model Governmentality Governance of PM	(Müller & Lecoeuvre, 2014) (Müller, 2009) (Müller, Zhai, et al., 2017) (Müller, 2009)	p.1346-1357 p.23-28 p. 391 p.31-40	7 artist, 3 economist, 2 conform, 2 agile 1 company specific, all Steering Group 6 liberal, 2 neo-lib, 2 authoritarian 4 step 1, 4 step 1 plus parts of 2
Business integration	Portfolio strategy Portfolio management Portfolio optimization Benefits realization	(Kopmann et al., 2017) (Kopmann et al., 2017) (Cooper, Edgett & Kleinschmidt) (Bradley, 2014)	Discussion of characteristics	9 link to strategy, 1 link to resources, 1 no All – decision by management team 2 cost reduction, 2 business value 6 some form of benefits management
Organizational integration	Program Megaproject Project	(Turner & Müller, 2003) (Bent Flyvbjerg, 2014) (Turner & Müller, 2003)	Discussion of characteristics	8 programs 1 supplier for megaprojects All - projects
Project governance	Institutions and roles Policies Relations Methodology	(Müller et al., 2017b) (Müller, 2009) (Turner, 2004) (Müller, 2009)	Discussion of characteristics	All- Steering groups 2 emphasize adherence to policies 1 customer contract (re-measurement) 9 predictive (PRINCE2), 2 agile
Project management	Project-life-cycle Risk and change management	(Mantel, Meredith, Shafer, & Sutton, 2008)	Discussion of characteristics	Wide range from loosely to strictly managed