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Fossum, K. R., Binder, J. C., Madsen, T. K., Aarseth, W. & Andersen, B.

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# **Success factors in Global Project Management**

## **- A study of practices in organizational support and the effects on cost and schedule**

**Knut R Fossum**

Faculty of Engineering,  
Norwegian University of Science and Technology, Trondheim, Norway and  
Center for Interdisciplinary Research in Space, NTNU Samfunnsforskning AS,  
Trondheim, Norway

**Jean C. Binder**

International Institute of Management in Technology,  
University of Fribourg, Fribourg, Switzerland

**Tage K. Madsen**

Department of Marketing and Management,  
University of Southern Denmark, Kolding, Denmark

**Wenche Aarseth**

Business School, Nord University, Bodø, Norway, and

**Bjorn Andersen**

IPK, Norwegian University of Science and Technology,  
Trondheim, Norway

### **ABSTRACT**

**Purpose** – The purpose of this paper is to identify and complete the existing lack of quantitative data at the crossroads between organizational support (OS) practices and project management (PM) success in Global Projects (GPs) and discuss implication of the results in perspective of the theory-practice gap.

**Design/methodology/approach** – Building on classical organizational theory and GP knowledge areas, a survey addressing GP practitioners was designed. This paper focuses on OS practices as success factors and addresses a subset of the survey (1170 respondents across 74 countries).

**Findings** – OS practices included in the study were found to have high importance for managerial success. OS practices for selection and training of team members show significant correlation with project efficiency but have low adaptation in many organizations. Statistically significant correlations were found to be weaker than expected, indicating that the relation between OS practices (as success factors) and project efficiency (as success criteria) is more complex than expected.

**Research limitations/implications** – The work constitutes opinion-based research and is vulnerable to variations in OS practices and the definition of success in different organizations and industries. The granularity level of the theoretical framework brought about relative high-level survey questions and may impact the applicability of the results.

**Practical implications** – To improve the efficiency of global projects, better implementation of OS practices for selection processes and training personnel has been suggested. **Originality/value** – The theoretical alignment of classical organizational variables with GP knowledge areas and associated practices provides an original approach to the “theory–practice gap” discourse.

**Keywords:** Global projects, organizational support, practices, project success, project efficiency

**Paper type** Research paper

## INTRODUCTION

Project Management (PM) literature on Global Projects (GP) focuses to a large extent on contextual and relational factors and how global organizations should adapt their practices to the global context of their projects. However, there is still a lack of research investigating correlation of such practices to managerial success and project efficiency using a large sample of global expert PM practitioners across several countries. Our efforts are motivated by the number of GPs with cost overruns, delayed deliverables and low stakeholder satisfaction reported by several authors (Aaltonen and Sivonen, 2009, Aarseth et al., 2011, Lind and Brunes, 2015, Orr et al., 2011, Ainamo et al., 2010, Tang and Shen, 2013).

In this context, one observation holds true for many PM practitioners and academics: the human factor<sup>1</sup> creates challenges as well as solutions. Whatever undertakings we humans set out to complete, even efforts to create fully autonomous systems, they are imprinted with aptitudes and flaws spawned from the nature of human beings. Within the PM discipline, such a perspective is most familiar to the behavioural school, which highlights the importance of the relationships between people on the project, team building, leadership, communication and human resource management (Bredillet, 2008a). Knowledge of human nature is also prominent in stakeholder management literature and in the key ideas put forward by the marketing school (Bredillet, 2008b). The understanding and modelling of organizational, behaviour and political issues affecting projects are also part of the modelling school soft-

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<sup>1</sup> This study refers to the human factor as the human abilities, limitations, and other characteristics that are relevant to design of tools, machines, systems, tasks, jobs, and environments for safe, comfortable, and effective use.

system methodology and sense-making literature (Bredillet, 2007). The capacity of an organization to provide appropriate support to its managers and employees, i.e. management of the human factor, should thus be a topic of interest within several schools and research streams in the PM discipline.

Drouin and Jugdev (2013) highlight the importance of translating knowledge from more established fields to PM research. PM is still evolving and there are merits in the concept of drawing from solid theoretical foundations, such as those found in organizational theory. However, the theory–practice gap dilemma in organization studies (Bredillet et al., 2015) as well as the shortcomings of organizational models (Bolman and Deal, 2017, Morgan and London, 1998) and more specifically the shortcomings of management models and management theories in terms of understanding and guiding practitioners (Ghoshal, 2005, Mintzberg, 2004) form the central argument that organizations are, and must be, viewed from different theoretical perspectives – and that single theories or approaches cannot address the full complexity of organizations.

The effects of organizational support (OS) on project teams working across locational, temporal, and relational boundaries to accomplish an interdependent task are addressed by Drouin et al. (2010). They found that few publications have examined OS with the perspective of discussing how OS is an area with a strong impact on project success. This paper addresses GP from the viewpoint of the success school, i.e. with a focus on factors influencing the criteria by which success is measured (Bredillet, 2008a). The study address the lack of large-scale quantitative data addressing a novel link between OS practices and managerial success (as a qualitative measure of success as assessed by GP practitioners) and at the same time to the project efficiency elements of cost, schedule and scope.

## **LITERATURE ANALYSIS**

This chapter starts with a short introduction GPs and the key challenge variables that define them. Second, the classical organizational theory which this study draws upon and the role of OS in PM research are discussed. Third, OS practices in GPs are conceptualized. Finally, the notion of practices, success and project efficiency is explored, and the research hypotheses and questions are defined.

### **Global Projects (GPs)**

Globalization changed the way in which organizations design and develop their products and created a need for additional research addressing factors of specific interest for projects in such settings (MacDonald et al., 2012, Orr et al., 2011, Binder et al., 2010, Aarseth et al., 2011, Anantatmula and Thomas, 2010). This study adopts the GP definition as a “...temporary collaboration between organizations across nations and cultures with the intention to jointly deliver a unique product or service in a complex external context requiring relationship management” (Aarseth et al., 2013).

The categorization of projects is a central and conceptual tool allowing PM researchers to be explicit about the types of projects they are theorizing about (Söderlund, 2011), i.e. — no project can be studied comprehensively without considering its context (Hanisch and Wald, 2012), and support efforts to compare similarities and differences across projects. As an example, research on 'temporary multi-organisations' (TMO) and 'inter-organizational projects' (IOP) (de Blois et al., 2016, Lizarralde et al., 2011) address topics that are highly relevant for GPs. However, they do not address all aspects that make project global, e.g. addressing projects where all organizations are from different countries and involve people from different languages and cultures.

Thus, to typify GPs and separate them from projects with similar and relevant challenges such as virtual, multicultural, inter-organizational, multi-organizational, inter-institutional or

cross-functional projects, this paper build on the frameworks of Binder and Aarseth (Binder et al., 2009, Binder, 2007, Aarseth et al., 2011, Aarseth et al., 2013) using five “GP challenge variables”, i.e. (multiple) *languages, locations, organizations, cultures and time zones* to define GPs.

From a different angle, previous studies (Lyytinen and Newman, 2008, Binder et al., 2009) proposed that five areas of knowledge have relevance for the management of GPs: Teams, Communication, OS, Collaborative tools and Collaborative techniques. Verburg et al. (2013) analysed several critical success factors in current GP literature and concluded that OS is of special important for the success of GP. GPs are typically carried out in institutionally demanding environments (Aaltonen et al., 2008) and an extensive case study performed on GP defined OS as the most important factor for the success of GP and an “...area of global PM that pertains to how the global organization can support its projects and project staff to enable their best performance in GPs” (Aarseth et al., 2011). The notion that traditional success factors were previously focused on internal project issues, while more recently global success factors are mainly focused on the role of the global management, global leadership and the human side of management is supported by several authors (Binder et al., 2010, Anantatmula and Thomas, 2010, Orr et al., 2011, Aaltonen et al., 2008) As such the focus on contextual and relational factors, and how global organizations should adapt their processes and practices to the global context of their projects, is prominent in the GP literature. Our focus in this paper is to understand which of these practices are applied in GPs, and with what results.

### **Organizational theory and Organizational support (OS)**

One of the early contributions to categorizing the socio-technic study of organizations is the Leavitt’s diamond model depicting four interdependent variables: task, technology, structure, and people (Leavitt, 1965, Leavitt, 1964). Like Leavitt, Clark (1972) used four basic variables. Scott (2003) further adapted Leavitt’s model and suggested that an organization comprised the following elements: social structure, goals, technology, and participants. Bergman et al.

(2013) drew upon organization theories from Scott (2003) and Scott and Davis (2007) using four different perspectives, i.e. product, process, people, and structure, as a depiction of an organization. In an effort to demonstrate how project success is dependent on the selected PM approaches, Rolstadås et al. (2014) applied an analytical model, referred to as the Pentagon model. The model (Schiefloe, 2011) depicts five aspects of an organization, i.e. structure, technologies, culture, social relations and networks, and interaction. In a recent study Gemünden et al. (2018) revisited the variables and proposed a new concept of the project-oriented organization composed of three segments, i.e. values, structures, and people. A common agreement in most of these studies and categorizations is the relevance of the structure variable, which is the focus of our study. This is not because the impact of other variables is considered less significant, but to focus our analysis on this segment in more detail, and for our findings to be more specifically understood, assessed and applied by practitioners when defining OS practices.

OS can be both intangible, such as showing care and understanding during the project, and tangible, for example by providing adequate technological infrastructure (Gelbard and Carmeli, 2009, Aarseth et al., 2013, Drouin et al., 2010). Both are highly relevant and research describes many shortfalls in project performance that are rooted in intangible support gaps such as inadequate inter-firm collaboration and low attention to social dynamics (Suprpto et al., 2015).

When investigating conditions that project managers in dispersed settings perceive as relevant to doing their work, Verburg et al. (2013) included OS aspects such as multimedia and technical support, and corporate support in terms of tools, infrastructure, policies, rewards, and incentive systems for dispersed work. Aarseth et al. (2011) defined OS as an, "...area of GP management that pertains to how the global organization can support its projects and project staff to enable their best performance in GPs". In their research into effects of OS on components of virtual project teams, Drouin et al. (2010) outlined a conceptual framework where OS is divided into seven categories of support systems and 18

different mechanisms associated with the different support systems. Zwikael et al. (2005) used a Project Management Planning Quality model (Zwikael and Globerson, 2004) to study cultural differences in PM capabilities, using 33 products and processes, including 17 focusing on OS. Berssaneti and Carvalho (2015) found relations between high maturity of PM practices and project completion on time and at cost, thus supporting findings by Gelbard and Carmeli (2009) reporting that interaction between team dynamics and OS was significantly related to budgetary, functionality and time performance. Based on such studies, OS can be defined in the scope of our research as the use of governance systems, structures of authority and processes, aiming at coordinating, controlling and supporting the efficient and successful delivery of projects.

**OS Practices in GP management – The structure variable**

Guided by the notion that GP success factors are often related to the role of global leadership and the human side of management, this paper focuses on OS related to the structure variable of socio-technical organizational studies (Leavitt, 1965, Lyytinen and Newman, 2008) and the GP knowledge area of organization (Binder et al., 2010). Table 1 shows the links between these two areas and summarizes the six categories of practices that will now be defined in more detail: definition of a GP structure, selection and training, Global PMOs, executive support and collaborative strategies.

<b>Organizational Variables</b> (Leavitt, 1965, Lyytinen and Newman, 2008)	<b>Areas of GP Knowledge</b> (Binder et al., 2010, Aarseth et al., 2013)	<b>Global PM Practices</b>
Structure	Organization	<ul style="list-style-type: none"> <li>- GP structures - specialization</li> <li>- GP structures - geographical</li> <li>- Selection and Training</li> <li>- Global PMO</li> <li>- Support from senior executives</li> <li>- Global collaborative strategies</li> </ul>
<i>People</i>	<i>Teams</i>	<i>Out of the scope of this study</i>
<i>Task</i>	<i>Communication</i>	
<i>Technology</i>	<i>Collaborative tools</i>	
	<i>Collaborative techniques</i>	

*Table 1 – The scope of this research, positioned in the perspective of the organizational variables and GP areas of knowledge*



### *GP structures – team specialization*

GP structures are rooted in the general PM knowledge and practices written in bodies of knowledge such as the PMBOK (2017), PRINCE2 (2017) and APM (2012). There are various ways to organize the project teams, e.g. centralized or distributed PMs, local coordinators vs. functional coordinators (Binder et al., 2010, PMBOK, 2017, Rad and Levin, 2003). When defining a GP structure, one must consider that project team members with the same discipline specialization, e.g. software development teams, usually share a common frame of reference in the principles, tools and jargon of their discipline, and often this is the case even across country borders. Such homogeneity represents factors that can reduce or compensate for other challenges of GP teams. Thus, the adaptation of GP structures to the specialization of the team members represents one important OS practice in GP.

### *GP structures - geographical distribution*

The geographical dispersion of the project teams is a hallmark of GP. Such geographical dispersion can be the result of strategic and fiscal decision-making made at top management levels of parent organizations. The implementation of multiple geographical locations across countries is the original decision that potentially exacerbates the other categories of GP challenges (different languages, cultures and time zones). GP structures should align with the approaches and procedures of parent organizations and can be tailored to national settings, systems and technology necessary for effective processes and communication for each GP (Aarseth et al., 2013). As such, key OS practices for GP are related to how GPs' organizational structure is adapted to the geographical dispersion of the team members.

### *Selection and training*

The selection and training of GP team members are in some cases performed at project level, at the discretion of the project manager (Keegan et al., 2012). However, more often the allocation of people to project teams is based on availability of resources in the parent organization and partner companies and is influenced by key stakeholders (Drouin et al.,

2010, Gelbard and Carmeli, 2009, Aarseth et al., 2013, Binder et al., 2010). OS practices related to selection and training often reflect human resource management (HRM) policies and practices of the parent organizations, focusing on corporate staffing mechanisms, career development, and performance and rewards systems. Furthermore, companies define, select and refine competence requirements for personnel based on their key activities, environmental and organizational characteristics (Keegan et al., 2012). As one example, an engineering company with a prime contractor role tends to emphasize legal and technical skills over cultural and relational skills (Aarseth et al., 2011, Orr and Scott, 2008). Key OS practices for selection and training of GP personnel are therefore related to skills and processes needed to overcome GP challenges, such as communication norms, role clarity and trust (Henderson et al., 2016).

#### *Project Management Offices (PMO)*

PMOs represent both the permanent organizational structures where PM specialists interact with PM process owners, portfolios and programmes within a parent organization (Huemann et al., 2004), and the temporary organizations that are established to support a large programme or group of projects (Aubry, 2015). The PMO may be responsible for knowledge sharing, training and management of PM personnel, sometimes in cooperation with the HR department (Huemann et al., 2004, Aubry, 2015, Lee-Kelley and Turner, 2017). Key OS practices in global PMOs are often related to the implementation of mechanisms such as coaching and assistance, information and knowledge sharing related to political, legal and cultural factors (Gelbard and Carmeli, 2009, Aarseth et al., 2013, Drouin et al., 2010).

#### *Support from senior executives*

Support from senior executives is an important OS practice for GPs (Young and Poon, 2013, Suprpto et al., 2015). Aarseth et al. (2013) identified lacking OS from the parent organization as one of the main challenges for GP managers, and Binder et al. (2010) recommended that senior executives in global organizations adapt processes, policies and

procedures to cope with the challenges of GP. When investigating conditions that project managers in dispersed settings perceive as relevant to get their work done, Verburg et al. (2013) recommended senior executives to provide support to their teams as a prerequisite for the implementation of tools, infrastructure, policies, rewards and incentive systems for dispersed work. Aarseth et al. (2011) defined OS as an "...area of global project management that pertains to how the global organization can support its projects and project staff to enable their best performance in global projects". As such, OS practices related to senior management support include allocation of resources needed for global teams to develop the relational aspects of GP (Suprpto et al., 2015).

### *Global collaboration strategies*

As globalization drives organizations to reach out in a cooperating manner to entities previously viewed only as competitors, such networks become cornerstones of global collaboration strategies. OS practices related to these strategies include policies, plans and processes for partnership and relationship management, increasing access to a deeper pool of personnel with broader competences early in the collaboration (Aarseth et al., 2013).

### **Practices as success factors**

Research addressing success factors represents an important stream in PM literature. Four decades of research have brought up a variety of new success factors and extended the number of success criteria (Joslin and Müller, 2015, Hobbs and Besner, 2016). Zwikael and Globerson (2006) and Fortune and White (2006) presented a broad review of the success factors found in the literature and reported several limitations, such as unclear definitions, limited agreement on what factors influence project success and the proportion of success explained by success factors.

Hobbs and Besner (2016) proposed a distinction between success factors and PM practices, which can be defined as the common PM norms, routines, traditions and rules that guide the behaviour of project managers in general circumstances and are described in bodies of

knowledge and textbooks (Blomquist et al., 2010, Thomas et al., 2012). Practices, within OS, can manifest as emotional (intangible) and technical (tangible) artefacts (Aronson et al., 2013, van der Hoorn and Whitty, 2015). If found to be successful, recognized and adopted by other project managers, they become part of accepted practices (Blomquist et al., 2010). Such practices only become success factors if they can be linked to PM success (Hobbs and Besner, 2016) by assessing their impact on project efficiency or qualitative factors such as product success, quality of deliverables, team performance and satisfaction of team members (Aladwani, 2002, Drury-Grogan, 2014, El-Sabaa, 2001). GP practitioners can assess these qualitative factors for each of their projects, in the form of managerial success. The successful delivery of benefits by individual projects (Ojiako et al., 2012) is expected to contribute to the parent organization's capability and/or performance (Cooke-Davies, 2002), increasing their efficiency-effectiveness and competitive advantage (Hunt & Duhan, 2002; Shenhar, Dvir, Levy, & Maltz, 2001).

### **The impact of OS Practices on PM success in GPs**

Previous GP research is motivated by a high number of GPs with cost overruns, delayed deliverables and low customer satisfaction (Aaltonen and Sivonen, 2009, Aarseth et al., 2011, Lind and Brunen, 2015, Orr et al., 2011, Ainamo et al., 2010, Tang and Shen, 2013). An examination of the PM success factors reveals that a vast majority is influenced by contextual conditions such as organization or management support (Young and Poon, 2013), highlighting a potential correlation between OS practices and successful projects. Although there appears to be little or no agreement on how to measure the contribution of such practices to PM success (Gauthier and Ika, 2012, Shenhar et al., 2001), the idea of studying practices as success factors has merits if it can be shown that they have a significant differentiating effect on project efficiency (Hobbs and Besner, 2016). Project efficiency factors such as scope, cost and schedule can thus be considered directly linked to PM success (Jugdev et al., 2013, Neves et al., 2016, Reich et al., 2014, Hobbs and Besner, 2016, ul Musawir et al., 2017).

## **HYPOTHESES AND RESEARCH QUESTIONS**

Having described the theoretical foundations underpinning our study, GP and OS were discussed and defined, and the notion of OS practices as GP success factors was put forward. The analysis of GP discourse indicated that OS practices related to the structure variable may be of specific importance, related to definition of a GP structure, selection and training, PMOs, executive support and collaborative networks. Based on this analysis three hypotheses and associated research questions were formulated.

Our first research hypothesis (RH1) is that a large proportion of GPs are not delivered on budget and schedule, which must be assessed in larger samples of projects covering multiple countries, organizations and industries, leading to our first research question:

**RQ1 – How efficient are GPs (delivery on budget and schedule), in comparison to local projects?**

The analysis of extant research on GP, OS and OS practices in GP suggests a second research hypothesis (RH2) that GPs in which OS practices are implemented has a higher probability of success. Such a hypothesis can be tested in a large sample of projects and leads to two research questions, first assessing the project success from an efficiency perspective and measuring the project costs, schedule and scope:

**RQ2 - What is the correlation between implementation of OS practices and GP efficiency?**

From a practitioner perspective, success criteria vary for each project and are defined at early stages at the project charter (PMBOK, 2017). In this respect, the third research question assesses the managerial success of GPs from a qualitative perspective through the standpoint of the GP practitioners, which might combine elements beyond cost and schedule, and can be better assessed by experienced professionals who understand how successful their projects are in comparison to the unique success criteria specified for them:

### **RQ3 – What OS practices are considered important by GP practitioners for project success and are implemented in their projects?**

Our research objective is therefore to assess the OS practices in GP contexts and to determine the practices that are deemed successful by expert practitioners (managerial success), and also identify the practices that can be correlated to project efficiency.

The next section presents the research approach and method used to collect evidence from the experience of GP practitioners and address the three research questions.

## **METHODOLOGY**

Scholars hold different views about the concept of organizations, e.g. whether they consist of artefacts or processes (Van de Ven and Poole, 2005, Aubry and Lavoie-Tremblay, 2018). Such distinctions can be traced back to antiquity and differing philosophies, e.g. those of Democritus and Heraclitus. The Heraclitean doctrine that 'all things flow' and 'nature is a process' is contrary to the Democritan view that nature consists in changeable interrelations among stable, unchanging units of existence (Rescher, 1996). Along the lines of David Graeber (Graeber, 2001), understanding critical realism as a form of 'Heraclitean' philosophy, we emphasize a world view of flux and change over stable essences. Furthermore, maintaining that critical realism constitutes a powerful approach to describe the interface between natural and social worlds: an interface that is arguably central to the understanding of what brings success and failures to projects. In this respect the natural world can exist irrespective of human activity, while the social world cannot. Although human activities are analytically and statistically separable from agential activities, they are relatively autonomous from the dynamic intricacy of both social and natural worlds (Allen et al., 2013). As such this study follows a constructionist ontology, in which the reality and meaning of social phenomena are created by the interaction of the social actors with the world (Bredillet, 2010).

An abductive research process is followed by this study, in line with the hypermodernity values of reflexivity over reason and the learning and adaptation of practices through

experience that allow an understanding of the OS and PM actions in complex organizational arrangements (Gauthier and Ika, 2012, Cicmil, 2006, Blomquist et al., 2010, Winter et al., 2006). Such process also satisfies the need for an interplay ‘...between theory and practice, between academics and practitioners’ (Winter et al., 2006) and the use of empirical inquiries (Bredillet, 2010) such as hypothesis testing and statistical analysis to ‘...match the achievements of natural science in explanation, prediction, and control’ (Lee, 1991). This is in line with Bryman (2012) since, “...quantitative research can play a significant role in relation to a constructionist stance” using Likert scaling techniques to investigate the GP practices through the eyes of the practitioners participating in the study.

The literature analysis was performed to identify the role of OS practices as success factors in GP literature and to define the categories of practices to be investigated (previously shown in Table 1). A survey instrument was then used to assess the extent to which these practices are considered successful and are being used by GP managers, as well as their correlation with project efficiency. The survey-based research was selected for its ability to collect experience data from a large sample group, thus allowing generalization to a broader population and addressing the constructionism concern with issues of representation (Bryman, 2012). The survey comprised questions (in Appendix 1) that were designed in direct alignment to our research questions as illustrated in Table 2 and Figure 1 below.

<b>RQ</b>	<b>Research questions</b>	<b>Survey questions</b>
RQ1	How efficient are GPs in comparison to local projects?	SQ1, SQ2, SQ11, SQ12, SQ13
RQ2	What is the correlation between implementation of OS practices and GP efficiency?	SQ6, SQ11, SQ12, SQ13
RQ3	What OS practices are considered important by GP practitioners for project success and are implemented in their projects?	SQ6, SQ15
-	Demographic questions	SQ16-SQ22

*Table 2 – Design of survey questions in alignment to the research questions.*

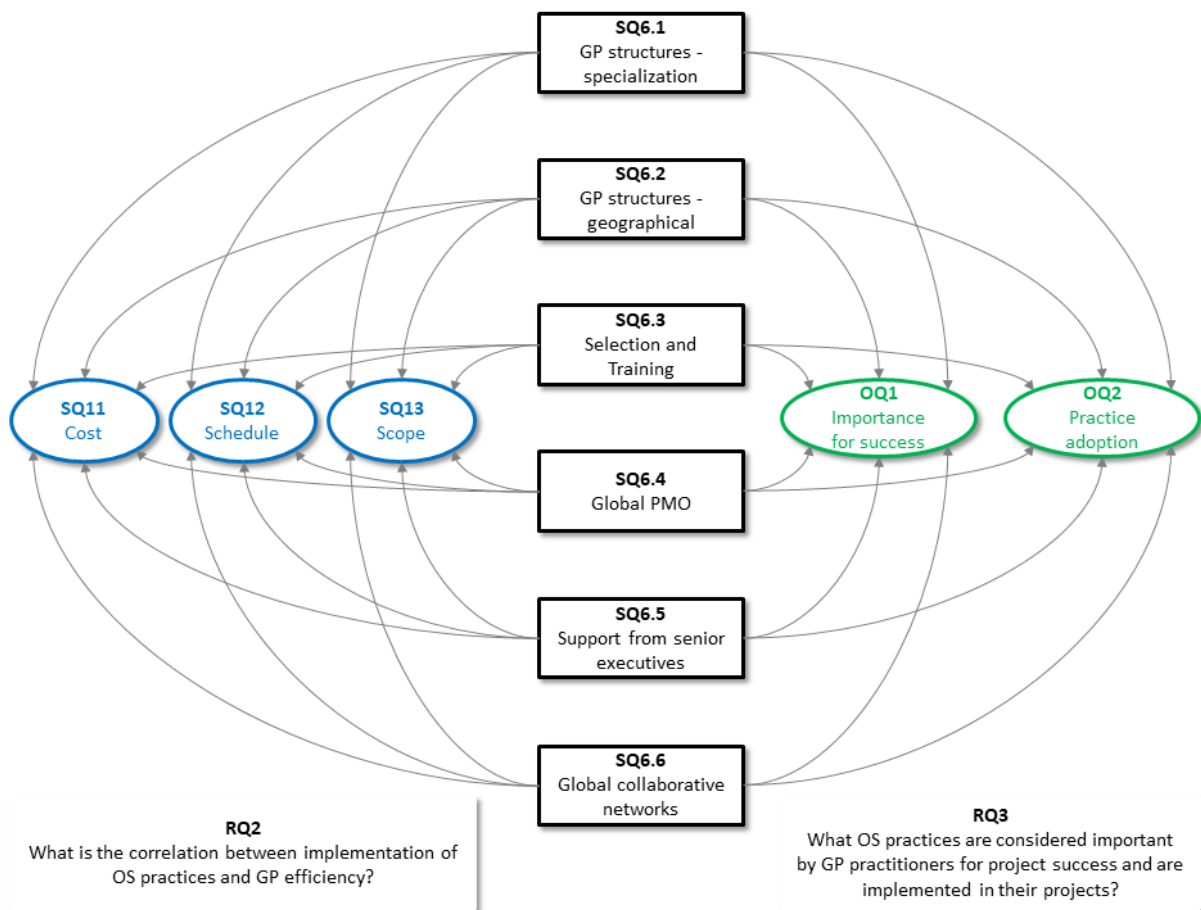


Figure 1 – Research design, with possible correlations displayed in alignment to RQ2 and RQ3.

The survey questions were designed according to the principles established by Bryman (2012) and Oppenheim (2000). SQ11, SQ12 and SQ13 used scales to address RQ1 and RQ2 (see appendix). In order to address RQ2 and RQ3, SQ6 used a Likert scale to allow participants to assess the extent to which a particular practice is important to the success of their projects (managerial success) and the extent to which the practice is implemented in their project organization (see Table 3). This approach is in line with similar PM studies (see for example Hobbs and Besner (2016)) and rests on the assumption that respondents, as expert PM practitioners, adopt the perspective of practitioners' bodies of knowledge to project success, which is that success criteria vary for each project and are defined at early stages at the project charter (PMBOK, 2017). To confirm such premises the survey questions are divided in three types:



- 1) Demographics questions to ensure our sample represents experienced professionals (SQ17-SQ22) and to determine which of these professionals manage GPs (SQ2, SQ15);
- 2) Questions on the success factors under study, i.e. the importance and implementation of OS practices (SQ6); and
- 3) Questions on PM success criteria (SQ11-SQ13), i.e. the status of PM efficiency (Cost, schedule and scope).

The questions were adapted after a review by two independent professors with published PM research. The adapted survey was submitted to eight pilot PM practitioners in three different companies and countries to assess the clarity of the questions and the overall assessment instrument. The survey was updated based on their comments and submitted to renowned PM associations and distributed among global organizations and PM practitioners. The online LimeSurvey™ software was used to collect the data, which was later exported to SPSS™ to perform statistical analyses. While 1170 answers were received, some respondents interrupted the survey before completion; therefore, each table presented in this study contains the number of valid and complete responses for each of the corresponding questions (consequently, the variable “N” has a different value for each result presented in the findings). This sample is considered sufficient to support the findings in this paper, based on other studies with large survey data in PM field (see for example Hobbs and Besner (2016)).

The survey data were analysed using Pearson correlation and contingency tables, also known as crosstabs. Pearson correlation evaluates whether there is statistical evidence for a linear relationship among the pairs of variables in a population. Pearson correlation between two variables X and Y has a value between +1 and -1, where 1 is full positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation. In cases where the Pearson correlation was significant at the 0.01 level (2-tailed), a crosstab was performed to further analyse interactions between the variables. This study presents the key findings using two correlation matrices and one crosstab.

The demographics questions were designed to assess the respondents' level of experience and their spread across geographies. The survey results included 1170 respondents from 74 different countries as shown in Figure 2, satisfying our intention to have a large sample that was not biased towards one specific country. Table 4 shows that the majority of respondents work with IS and ICT projects.

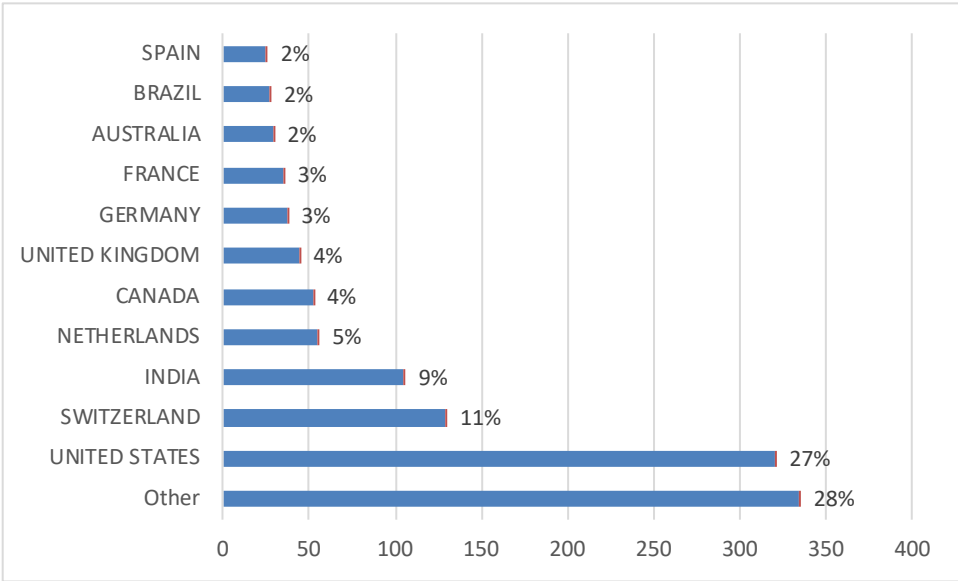


Figure 2 – Geographical distribution of survey respondents

In what type(s) of projects do you usually participate?		
Answer Options	Response Percent	Response Count
IS Projects (Information Systems: Implementation or	55,6%	365
ICT Projects (Information and Communications	29,9%	196
Building construction	8,8%	58
Naval construction	0,8%	5
Aerospace construction	1,7%	11
Infrastructure projects (roads, bridges, etc)	5,6%	37
R&D Projects	15,1%	99
Product development projects	23,8%	156
Organizational change projects	24,4%	160
Strategic projects	29,3%	192
Events projects	6,1%	40
Other (please specify)		81
	<i>answered question</i>	<b>656</b>
	<i>skipped question</i>	<b>515</b>

*Table 4 – Distribution among respondents over industry / project type. Respondents could select more than one project type.*

There is also a large proportion of GPs being managed by the survey participants, since only 133 out of 1050 (12.7%) responded that they have all team members located in the same country (SQ2). The majority of respondents have significant experience in managing projects and more specifically GPs, which is demonstrated by the following factors:

- 90% have a leadership role such as Project Leader, Project Manager, Programme Manager, PMO Manager, Senior Manager or Director (SQ17, N=656).
- 91% use a PM method or body of knowledge such as the PMBOK® Guide, PRINCE2, IPMA ICB or APM-BOK (SQ19, N=656).
- 78% of the respondents have more than 5 years of PM experience (SQ21, N=656).
- 62% have been working for more than 5 years in projects that involved people from different countries (SQ22, N=656).
- Approx. 85% of the respondents work with IS and ICT projects.

<b>GP OS practices</b>	<b>SQ</b>	<b>The statements presented to the respondents</b>	<b>Importance of practices</b>	<b>Adoption of practices</b>
GP structures - specialization	SQ6.1	The project organizational structure is adapted to the specialization of the team members.	OQ1	OQ2
GP structures - geographical	SQ6.2	The project organizational structure is adapted to the geographical dispersion of the team members.	OQ1	OQ2
Selection and Training	SQ6.3	Effective processes exist for selection and training of the team members.	OQ1	OQ2
Global PMO	SQ6.4	A Project Management Office provides support to the project manager.	OQ1	OQ2
Support from senior executives	SQ6.5	Senior executives provide effective support to the project manager.	OQ1	OQ2
Global collaboration strategies	SQ6.6	Senior executives define collaboration strategies with third parties during early stages.	OQ1	OQ2

*Table 3 - Six statements part of SQ6, addressing OS GP practices related to the structure variable*

*OQ1= [1-Not important, 2-Moderately important, 3-Important, 4-Very important, 5-Critical]*

*OQ2 = [1-Not at all, 2-To a little extent, 3-To a moderate extent, 4-To a great extent, 5-To a very great extent]*

Thus, ensuring the opinions come from a relevant sample (experienced practitioner project managers, several of which managing GPs) the survey allow investigations of correlations between success factors (OS practices) and success criteria (Cost, schedule, scope) for the management of GPs.

SQ3 to SQ5 and SQ7 to SQ10 were later deemed not relevant for the scope of this particular study and were not analysed / described in this paper.

## **FINDINGS**

After confirmation that the sample of respondents satisfies this study's premises of geographical diversity and a high level of PM experience across country borders, the first research question is now addressed. An analysis of the answers to SQ11, SQ12 and SQ13 (see Tables 5 and 6) does not show significant differences between local and global projects (despite the different proportion represented in the sample) and is in line with practitioner literature on the topic (PMI, 2015, APM, 2015):

- Cost – 56% of respondents report that their GPs have cost overruns (#4 and #5), but only 21.6% have reported a variance of more than 10% costs above budget (#5). A higher percentage of local projects (#3) have the same costs as the original budget (19.1% in comparison to 13.8%) or have variances of more than 10% below/above budget (#1 and #5), with respectively 11.3% and 24.3% in comparison to 8.6% and 21.6%. This may indicate a slight tendency of GPs to have more cost variances that have smaller financial impact.
- Schedule – The percentage of GPs (#3) completed later than originally planned (49.6%) is much higher than those that finish earlier (#1, 10.4%) or on schedule (#2, 40%). The percentage that complete earlier is slightly higher for local projects (14.1%) than for GPs.

- Scope – While 29.1% of GPs have the same scope as originally planned (#3), 42.6% have a scope that increased with impacts on cost or schedule; 20.7% of respondents report small variations in scope that do not affect cost and schedule (#2 and #4). This is a unique finding from this study, since other studies typically assess only changes in scope without categorizing their impact on the project efficiency. Only 7.8% reported a reduction of scope with impact on schedule or costs (#1).

Global Projects, N=450				Local Projects, N=57			
	Cost	Schedule	Scope		Cost	Schedule	Scope
1	8.6%	10.4%	7.8%	1	11.3%	14.1%	5.1%
2	21.6%	40.0%	3.1%	2	17.2%	38.6%	5.7%
3	13.8%	49.6%	29.1%	3	19.1%	47.4%	26.2%
4	34.4%		17.6%	4	28.2%		15.7%
5	21.6%		42.4%	5	24.3%		47.3%
	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%

Table 5 – Comparison of cost, schedule and scope variances between global and local projects (refer to the text above or to the appendix for the detailed explanation of ratings 1-5).

In addition, there is a significant correlation between project scope, cost and schedule variations (significant at the 0.01 level, 2-tailed), which gives a higher level of confidence in the construct validity of the survey instrument:

- Cost vs. Schedule: Pearson correlation of .415
- Cost vs. Scope: Pearson correlation of .189
- Schedule vs. Scope: Pearson correlation of .226

The second research question was then addressed, first by analysing the correlation between different types of practices and their effect on completing a GP within baseline costs and schedule. A Pearson correlation between SQ6 and SQ11 & SQ12 for each of the survey statements (SQ6.1 to SQ6.6) shows that only one OS practice (SQ6.3) correlates with both factors of PM efficiency with significance at the 0.01 level (2-tailed). No significant correlation was found with SQ13 (scope), which was removed from the tables for simplification purposes.

SQ	SQ6 - To what extent does each statement describe the situation in your project?	SQ11 - How is your project cost in comparison with the original budget?		SQ12 - How is your project schedule in comparison to the original plan?	
SQ6.1	The project organizational structure is adapted to the specialization of the team members.	,105*	,026	,056	,239
SQ6.2	The project organizational structure is adapted to the geographical dispersion of the team members.	,044	,357	-,019	,691
<b>SQ6.3</b>	Effective processes exist for selection and training of the team members.	<b>,139**</b>	,003	<b>,149**</b>	,002
SQ6.4	A Project Management Office provides support to the project manager.	-,006	,893	,044	,355
SQ6.5	Senior executives provide effective support to the project manager.	,080	,091	,073	,120
SQ6.6	Senior executives define collaboration strategies with third parties during early stages.	,053	,262	,090	,056
N=450		Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)

\*. Correlation is significant at the 0.05 level (2-tailed), \*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 6. Correlation analysis between OS practices and project cost and schedule.

Crosstabs between SQ6.3 and SQ11 & SQ12 were used to further analyse the interrelation between the variables (See Tables 7 and 8). The crosstab SQ6.3 x SQ11 shows that 22% of all respondents have costs more than 10% higher than original budgets, and there is a slight tendency for these deviations in projects where practices were not implemented or only to a little extent (11%) in comparison to projects where the implementation was done to a great or very great extent (4%). In the other categories (where costs are lower, equal, or 1%-10% higher), a normal distribution is observed.

Likert (n=450)	+10% LOWER	1-10% LOWER	THE SAME	1-10% HIGHER	+10% HIGHER	Total
1 Not at all	0%	2%	2%	6%	4%	14%
2 To a little extent	2%	6%	4%	7%	7%	24%
3 To a moderate extent	4%	7%	3%	11%	6%	31%
4 To a great extent	2%	4%	4%	8%	3%	22%
5 To a very great extent	0%	2%	2%	3%	1%	8%
Total	9%	22%	14%	34%	22%	100%

Table 7. Crosstab – The extent to which practices for effective processes for selection and training of the team members (SQ6.3) are implemented vs. cost (SQ11) variances

In the crosstab SQ6.3xSQ12, this tendency is even stronger. 40% of the surveyed projects finish with the same schedule and the proportion of projects that have OS practices implemented to a great or very great extent is 15%, in comparison to 12% where practices are not implemented or only to a little extent. Within the 50% projects that finish later than original schedule, there is a tendency for these deviations in projects where practices were not implemented or only to a little extent (23%) in comparison to projects with implementation to a great or very great extent (12%).

Likert		Earlier	The same	Later	Total
1	Not at all	1%	4%	9%	14%
2	To a little extent	3%	8%	14%	24%
3	To a moderate extent	3%	13%	15%	31%
4	To a great extent	3%	10%	9%	22%
5	To a very great extent	1%	5%	3%	8%
Total		10%	40%	50%	100%

Table 8. Crosstab – The extent to which practices for effective processes for selection and training of the team members (SQ6.3) are implemented vs. schedule (SQ12) variances

It was previously discussed that, beyond efficiency factors such as cost and schedule, success criteria vary for each project and are defined at early stages. The correlation between the importance of OS practices and managerial success (as assessed by the experienced GP practitioners) was then assessed to address the third research question (see Table 9). In all categories, there are more respondents who consider the practices as very important to critical, in comparison to not important or moderately important, indicating that all OS practices are considered to have high managerial importance for GPs. The importance of four types of practices is even more salient:

- The majority (72.9%) of the respondents consider that senior executives' effective support to the project manager is very important or critical.
- For the other three categories of OS practices, a majority of respondents consider them as important to very important: 71.5% for selection and training, 61.6% for PMO and 61.2% for collaboration strategies.































		Global Projects, N=469					
		Org structure - specialization	Org structure geographical	Selection & Training	PMO	Senior executives	Collaboration Strategies
1	Not important	 4.7%	 11.7%	 3.6%	 9.6%	 0.6%	 6.2%
2	Moderately important	 20.3%	 20.3%	 15.1%	 13.9%	 6.6%	 17.9%
3	Important	 35.1%	 33.8%	 35.5%	 30.3%	 19.9%	 30.3%
4	Very important	 30.1%	 25.2%	 36.0%	 31.3%	 36.7%	 30.9%
5	Critical	 9.8%	 9.0%	 9.8%	 14.9%	 36.2%	 14.7%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 9. Answers to SQ6.1-6.6 (OQ1 = "How important is each statement to the success of your project?") filtered to select only GPs.

The implementation rate of OS practices (as assessed by the experienced GP practitioners) was also assessed to address the third research question (see Table 10). 47.4% of GP practitioners consider that senior executives' effective support to the project manager is provided to a great or very great extent, which shows that almost half of GPs are able to benefit from an OS practice that has a high rating of managerial importance. In the two practices related to organizational structure, there are also more respondents applying them to a great or very great extent. However, this is not the case for the other three practices with high managerial importance:

- 30.3% of respondents have implemented selection and training practices to a great or very great extent, in comparison to 38.6% who had no such practices or only to a little extent. Considering that these practices have a correlation with project efficiency, in addition to managerial importance, there are clear opportunities to be explored in this area by the GP practitioners.



- 39.6% of respondents have implemented PMOs to a great or very great extent, in comparison to 40.3% who had no such practices or only to a little extent. 21.5% of respondents do not have a PMO, a percentage much higher than for other OS practices, which suggests that this is also a gap to be explored.
- 30.1% of respondents have implemented collaboration strategies to a great or very great extent, in comparison to 43.8% who had no such practices or only to a little extent, a percentage point higher than other practices.































		Global Projects, N=469					
		Org structure - specialization	Org structure geographical	Selection & Training	PMO	Senior executives	Collaboration Strategies
1	Not at all	 8.1%	 13.0%	 14.3%	 21.5%	 4.9%	 13.9%
2	To a little extent	 18.1%	 20.5%	 24.3%	 18.8%	 18.1%	 29.9%
3	To a moderate extent	 35.7%	 30.9%	 31.1%	 20.1%	 29.6%	 26.1%
4	To a great extent	 27.9%	 28.1%	 22.0%	 27.7%	 30.3%	 19.4%
5	To a very great extent	 10.2%	 7.5%	 8.3%	 11.9%	 17.1%	 10.7%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 10. Answers to SQ6.1-6.6 (OQ2 = “To what extent does each statement describe the situation in your project?”) filtered to select only GPs.

The correlations between OQ1 and OQ2 were also assessed (table 11). A significant correlation between OQ1 and OQ2 for the same SQs suggests that organizations tend to implement the practices that they consider important for the success of their GPs. Taking SQ6.4 as one example, respondents who consider that PMO support is important to the success of their projects (SQ6.4 OQ1) also tend to consider that such support is currently being provided by their organizations (SQ6.4 / OQ2). The results also imply that practices are not applied in isolation, as illustrated by the following correlations which were also found to be significant:

- Organizations that recognized the importance of senior executives’ defining collaboration strategies with third parties during early stages (SQ6.6 / OQ1) also implement all other OS practices (SQ6.1-SQ6.5 / OQ2).

- Organizations that were able to adopt effective processes for selection and training of the team members (SQ6.3 / OQ2) attributed importance to most other OS practices (SQ6.1, SQ6.2, SQ6.4, SQ6.6 / OQ1).
- Organizations that value the adaptation of project organizational structure to the specialization of the team members (SQ6.1 / OQ1) were also able to adapt such structure to the geographical dispersion of team members (SQ6.2 / OQ2). The opposite relationship also exists (SQ6.1 / OQ2 vs. SQ6.2 / OQ1).
- Organizations where senior executives define collaboration strategies with third parties during early stages (SQ6.6 / OQ2) also consider it important to receive support from a PMO (SQ6.4 / OQ1) and from senior executives (SQ6.5 / OQ1).

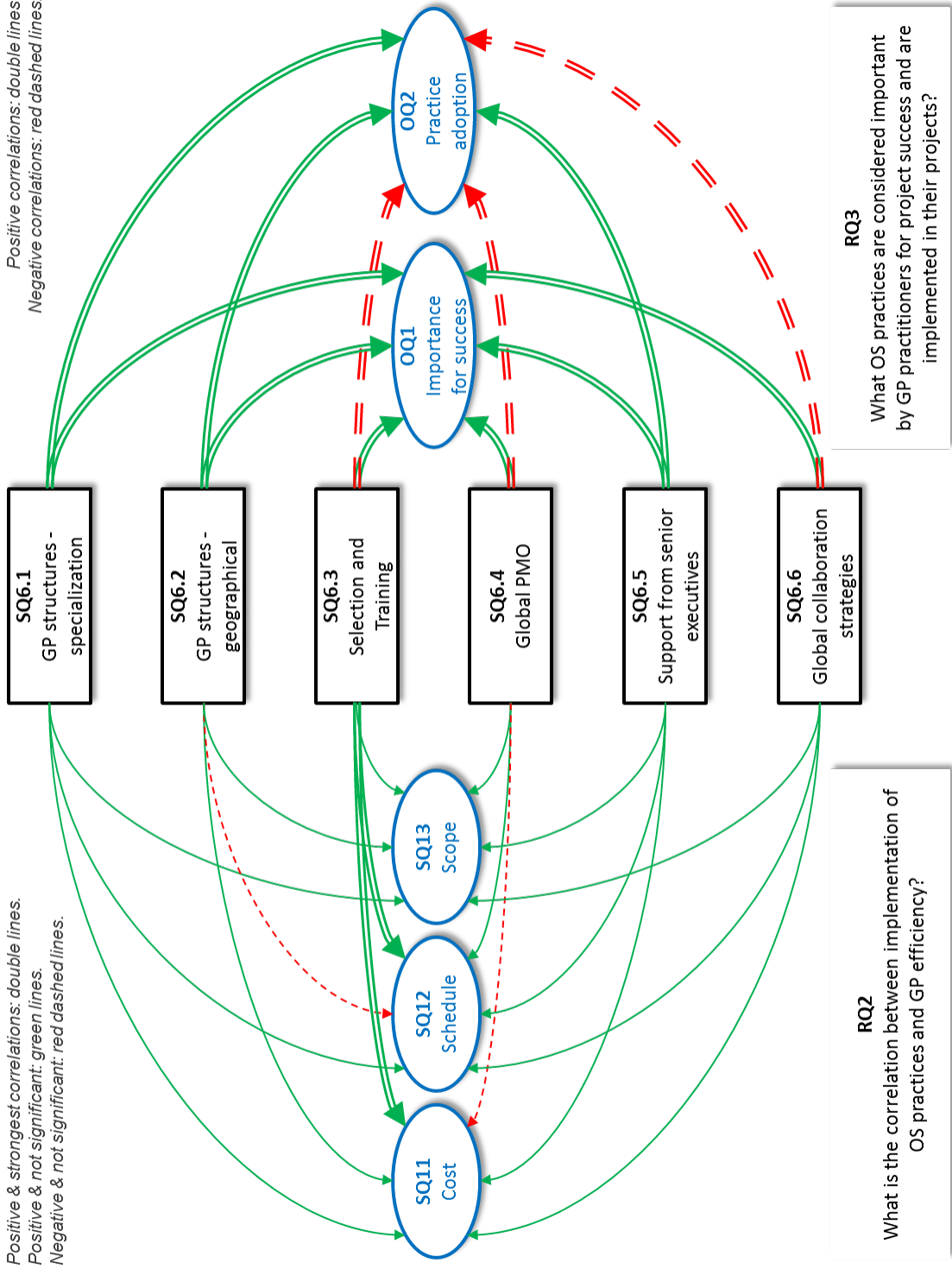
	SQ6.1 / OQ2		SQ6.2 / OQ2		SQ6.3 / OQ2		SQ6.4 / OQ2		SQ6.5 / OQ2		SQ6.6 / OQ2	
SQ6.1 / OQ1	<b>,578**</b>	,000	<b>,207**</b>	,000	<b>,165**</b>	,000	,057	,217	,103*	,026	,092*	,047
SQ6.2 / OQ1	<b>,223**</b>	,000	<b>,613**</b>	,000	<b>,173**</b>	,000	,085	,065	,027	,555	,034	,467
SQ6.3 / OQ1	,104*	,025	<b>,178**</b>	,000	<b>,471**</b>	,000	,092*	,046	-,016	,736	,041	,378
SQ6.4 / OQ1	,068	,139	,112*	,016	<b>,161**</b>	,000	<b>,511**</b>	,000	,106*	,022	<b>,165**</b>	,000
SQ6.5 / OQ1	,082	,076	,114*	,014	-,010	,828	,071	,127	<b>,403**</b>	,000	<b>,147**</b>	,001
SQ6.6 / OQ1	<b>,144**</b>	,002	<b>,153**</b>	,001	<b>,182**</b>	,000	<b>,177**</b>	,000	<b>,193**</b>	,000	<b>,557**</b>	,000
N = 469	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).												

Table 11. Correlation analyses of OQ1 (“How important is each statement to the success of your project?”) and OQ2 (“To what extent does each statement describe the situation in your project?”) for SQ6.1 to SQ6.6.

## DISCUSSION

Our analysis of a large sample of experienced GP practitioners spread across several countries has shown that a large proportion of GPs are not delivered on budget, on schedule or to scope. Our survey shows that these efficiency factors have a similar variance in global

and local projects, which answers our first research question and leads to the suggestion that GP practitioners and organizations executing GPs must invest more in creating the right conditions for such projects to be more efficient. Understanding which practices can be implemented at project and organizational level is therefore of utmost importance. Figure 3 summarizes our findings, which will now be discussed.



*Figure 3 – Correlations identified by the survey with a large sample, displayed in alignment to RQ2 and RQ3.*

When addressing our second research question in a large sample of projects, it was found that OS practices did not have a significant correlation with scope variance, and only one OS practice had a significant correlation with GP efficiency as measured by cost and schedule variance: the selection and training of GP team members. Such a finding is especially important to support the advancements of past years in establishing and improving bodies of knowledge, certifications and training in PM. It also suggests a continuous need for training in the global aspects of PM. Organizations should focus on HRM and elaborate a list of GP management practices that are required for their GPs. Such a list can then be used in interviews and selection processes when staffing GP teams, and it could also serve as a basis for global organizations to train their resources to work in GPs. This list of practices should be aligned to GP challenges of languages, locations, organizations, cultures and time zones, ensuring that OS practices in GPs are well understood and implemented across all projects in global organizations.

This is not to say that other OS practices are irrelevant. RQ2 only deals with three efficiency variables and success is a broad concept with multiple parameters, which can be better assessed by experienced GP practitioners in comparison to the unique success criteria defined at early stages of their individual GPs. This dilemma was addressed in RQ3, which assesses the managerial success from the perspective respondents with considerable experience in projects and more specifically GPs. As a first conclusion of this assessment all OS practices are considered important for GP success. This shows that all OS practices have strong managerial importance, and as they do not all correlate with cost, schedule and scope, they might affect other project success factors. In terms of adoption, three OS practices were found to predominate in the GPs being surveyed: Senior executives provide support to their GPs, and the project structures are aligned to both specialization and geographical dispersion of team members. This answers our third research question.

### **Weak or missing correlations**

Based on the existing PM theory and research literature it was expected to find clear correlations between the OS practices and cost and schedule. A general trend of the results is that statistical correlations found are weaker than predicted. Three possible explanations for this are discussed. 1) Many respondents do not consider efficiency (cost and schedule) as key success criteria. 2) The studied OS practices are poor success factors for project efficiency (as success criteria). 3) The survey design had weaknesses.

*To what extent do practitioners consider efficiency as key success criteria?*

All OS practices addressed in this study are considered to be of high importance for managerial success, i.e. the respondents consider them important for the success of their projects. The weak or missing correlations between the OS practices and project efficiency could be an indicator that “at cost and on time” is not what the respondents think of when considering the success of their projects, i.e. the OS practices are important for success criteria other than cost and schedule. There is no evidence in this study for such argument but it is a plausible cause that align with known challenges related to cost creep (Samset and Volden, 2016, Flyvbjerg, 2007).

*Are OS practices poor success factors for project efficiency?*

Most respondents believe the OS practices are of importance for the success of their projects. They also consider most OS practices to be well implemented in their organization. With the weak correlation with project efficiency, one may conclude that the studied OS practices are poor success factors for the success criteria for cost and schedule. However, there is little or no disagreement in the PM discourse that OS practices addressed in this study constitutes key PM practices important for the success of projects. Results from this study may contribute to the discussion on what constitutes a success factor for project cost and schedule, and what does not (Fortune and White, 2006, Hobbs and Besner, 2016). A high proportion of respondents in this study work with IS and ICT projects while most studies

used as basis for the hypotheses, e.g. (Aarseth et al., 2013), are from other industries. As such, these results support the notion that the importance of OS practices differs depending on the type of project external environment.

### *Is the survey design to blame?*

The basic design of the survey questions is based on the concept that well implemented OS practice should correspond to lower cost overruns and less schedule delay. And vice versa, poorly implemented practice should correspond to higher cost overruns and greater delays. With opinion-based surveys, such an approach has known weaknesses regarding interpretation, definitions and scope of the addressed topic. The practitioners (respondents) may have varying ideas of when a practice is well implemented in their organizations and when it is not. The survey design unfortunately did not provide a clear frame of definition for this. The same applies to the definition of success. The OS practices addressed are also high level. The results of this study thus support criticism of opinion-based methods, e.g. (Hobbs and Besner, 2016), when investigating correlations of practices (as success factors) and success criteria, e.g. cost and schedule.

### **Contribution to the theory-practice discourse**

Blomquist et al. (2010) and Bredillet et al. (2015) are examples of important contributions to the PM theory-practise discourse. At its core there is an acknowledgement that research and practice is about the creation of different types of knowledge. Spawning the problem of what is “science that matters”, the notion of (bad) management theories becoming self-fulfilling and the challenges of propagating “practice within (strict) context” type of knowledge.

This paper do not claim to contribute to the academic theory-practise discourse itself but results from this study do offer an important contribution towards understanding the implications this discourse have for practitioners concerned with “management of the human factor”. That is, as all organizational theory has its limitations and all best practices depend on context, it is of key importance that organizations develop the appropriate practices for

selection and training, ensuring the proper skillsets, knowledge of the organizational context and the rationale for existing processes and practices.

### **Limitations and future research**

This paper focused on OS practices related to the structure variable (shown previously in Figure 1). More research is needed to assess the correlations between GP efficiency and success with other organizational variables such as People, Tasks and Technologies – linked to GP areas such as Teams, Communication, Collaborative tools and Collaborative techniques.

Future studies could analyse OS practices in GPs in more detail and assess their individual correlation with project success in specific contexts, in order to allow organizations to prioritize the training topics that are more beneficial to their GPs. Other studies could also investigate the training formats that are more adequate to suit the geographical dispersion of global teams, and recommend practices to select and interview resources that are based in distant countries. Another area of potential study is the consideration of reducing bias due to cultural differences in selection processes in order to increase diversity and inclusion in GP teams.

### **CONCLUSION**

GPs are temporary collaborations between organizations across locational, temporal and relational distances with the intention to jointly deliver a unique product or service. Six areas of OS practices related to the structure variable were addressed and approached from the viewpoint of the success school. Building on mature organizational models and theories, a framework for GP knowledge areas was elaborated, using OS practices as our unit of analysis to investigate correlations between OS and project scope, cost and schedule.

In the context of our study, four main conclusions can be made based on the surveyed GP practitioners, in alignment to our 3 research questions. A large proportion of GPs are not

delivered on budget, on schedule or to scope (RQ1). To address this, one OS practice can be implemented that was found to have a significant correlation with cost and schedule efficiency: the selection and training of GP team members (RQ2). In addition, all OS practices investigated by this study have strong managerial importance to other project success factors (RQ3). As an additional conclusion from RQ3, three of these practices are adopted in most GPs being surveyed: Senior executives provide support to their GPs, and the project structures are aligned to both specialization and geographical dispersion of team members. All other practices could be further adopted in order to increase project efficiency.

Overall, our findings align with previous results from Hutchinson (1994), Gelbard and Carmeli (2009), Huemann (2010), Drouin et al. (2010) and Aarseth et al. (2013). OS practices related to selection and training of team members have the strongest correlation with completing a GP within baseline costs and schedule. Considering the important volume of investments in GPs, the implications for practitioners are that appropriate selection processes and training can reduce the occurrence of budget overruns and schedule delays. Similar to other studies (see for example Hobbs and Besner (2016)), our research found that all OS practices have high importance for managerial success, despite their low correlation with efficiency factors of cost and schedule.

Our novel contribution was to address the lack of quantitative data which has led to the realization that all OS practices suggested by previous studies have high managerial importance in GP contexts and are deemed successful by expert practitioners, with one practice having in addition a significant correlation with project efficiency. However, even as one tries to label and describe project practices, the socio-technical situation mutates and projects are often agents of change that also undergo changes. PM processes and practices try (and often fail) to make PM a rational and safe activity, putting limits on what can and cannot be done. However, although humans are intendedly rational they are more often only limitedly so, supporting the central argument of Bredillet et al. (2015) that managers are rarely reduced to theory-applying decision makers. With this realization at heart, one can



conclude that organizations relying on GPs need “better best practices” for selection and training processes. Organisations need to prepare project personnel to identify and manage uncertainty originating from the social worlds with the same excellence that they prepare them to use natural and engineering science to understand and manage the natural world.

## ACKNOWLEDGEMENTS

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## REFERENCES

- Aaltonen, K., Jaakko, K. & Tuomas, O. 2008. "Stakeholder salience in global projects". *International Journal of Project Management*, Vol. 26, No. 5, pp.509-516.
- Aaltonen, K. & Sivonen, R. 2009. "Response strategies to stakeholder pressures in global projects". *International Journal of Project Management*, Vol. 27, No. 2, pp.131-141.
- Aarseth, W., Rolstadås, A. & Andersen, B. 2011. "Key factors for management of global projects: a case study". *International Journal of Transitions and Innovation Systems*, Vol. 1, No. 4, pp.326-345.
- Aarseth, W., Rolstadås, A. & Andersen, B. 2013. "Managing organizational challenges in global projects". *International Journal of Managing Projects in Business*, Vol. 7, No. 1, pp.103-132.
- Ainamo, A., Artto, K., Levitt, R. E., Orr, R., Scott, W. & Tainio, R. 2010. "Global projects: Strategic perspectives". *Scandinavian Journal of Management*, Vol. 26, No. 4, pp.343-351.
- Aladwani, A. M. 2002. "An integrated performance model information systems projects". *Journal of Management Information Systems*, Vol. 19, No. 1, pp.185-210.
- Allen, D. K., Brown, A., Karanasios, S. & Norman, A. 2013. "How should technology-mediated organizational change be explained? A comparison of the contributions of critical realism and activity theory". *Mis Quarterly*, Vol. 37, No. 3, pp.835-854.
- Anantatmula, V. & Thomas, M. 2010. "Managing global projects: A structured approach for better performance". *Project Management Journal*, Vol. 41, No. 2, pp.60-72.
- Apm 2012. *APM Body of Knowledge 6th edition* Association of Project Management.
- Apm 2015. *Conditions for Project Success - APM Research Report*. Association for Project Management.
- Aronson, Z. H., Shenhar, A. J. & Patanakul, P. 2013. "Managing the Intangible Aspects of a Project: The Affect of Vision, Artifacts, and Leader Values on Project Spirit and Success in Technology-Driven Projects". *Project Management Journal*, Vol. 44, No. 1, pp.35-58.
- Aubry, M. 2015. "Project Management Office Transformations: Direct and Moderating Effects That Enhance Performance and Maturity". *Project Management Journal*, Vol. 46, No. 5, pp.19-45.
- Aubry, M. & Lavoie-Tremblay, M. 2018. "Rethinking organizational design for managing multiple projects". *International Journal of Project Management*, Vol. 36, No. 1, pp.12-26.
- Bergman, I., Gunnarson, S. & Räisänen, C. 2013. "Decoupling and standardization in the projectification of a company". *International Journal of Managing Projects in Business*, Vol. 6, No. 1, pp.106-128.
- Berssaneti, F. T. & Carvalho, M. M. 2015. "Identification of variables that impact project success in Brazilian companies". *International Journal of Project Management*, Vol. 33, No. 3, pp.638-649.
- Binder, J., Gardiner, P. D. & Ritchie, J. M. 2010. "A model of success factors for Global Project Management". *Project Perspectives*, Vol., No.
- Binder, J. C. 2007. *Global Project Management: Communication, Collaboration and Management Across Borders*, Aldershot, UK, Gower Publishing, Ltd.

- Binder, J. C., Gardiner, P. D. & Ritchie, J. M. Global Project Management Framework: A Cartesian Concept Model. 2009. Project Management Institute.
- Blomquist, T., Hällgren, M., Nilsson, A. & Söderholm, A. 2010. "Project-as-practice: In search of project management research that matters". *Project Management Journal*, Vol. 41, No. 1, pp.5-16.
- Bolman, L. G. & Deal, T. E. 2017. *Reframing organizations: Artistry, choice, and leadership*, John Wiley & Sons.
- Bredillet, C. N. 2007. "Exploring research in project management: Nine schools of project management research (part 3)". *Project Management Journal*, Vol. 38, No. 4, pp.2-4.
- Bredillet, C. N. 2008a. "Exploring research in project management: Nine schools of project management research (part 4)". *Project Management Journal*, Vol. 39, No. 1, pp.2-6.
- Bredillet, C. N. 2008b. "Exploring research in project management: Nine schools of project management research (part 6)". *Project Management Journal*, Vol. 39, No. 3, pp.2-5.
- Bredillet, C. N. 2010. "Blowing hot and cold on project management". *Project Management Journal*, Vol. 41, No. 3, pp.4-20.
- Bredillet, C. N., Tywoniak, S. & Dwivedula, R. 2015. "Reconnecting Theory and Practice in Pluralistic Contexts: Issues and Aristotelian Considerations". *Project Management Journal*, Vol. 46, No. 2, pp.6-20.
- Bryman, A. 2012. *Social research methods*, New York, USA, Oxford university press.
- Cicmil, S. 2006. "Understanding project management practice through interpretative and critical research perspectives". *Project Management Journal*, Vol. 37, No. 2, pp.27-37.
- Clark, P. A. 1972. *Action research and organizational change*, Harper & Row London.
- De Blois, M., Lizarralde, G. & De Coninck, P. 2016. "Iterative Project Processes Within Temporary Multi-Organizations in Construction: The Self-, Eco-, Re-Organizing Projects". *Project Management Journal*, Vol. 47, No. 1, pp.27-44.
- Drouin, N., Bourgault, M. & Gervais, C. 2010. "Effects of organizational support on components of virtual project teams". *International Journal of Managing Projects in Business*, Vol. 3, No. 4, pp.625-641.
- Drouin, N. & Jugdev, K. 2013. "Standing on the shoulders of strategic management giants to advance organizational project management". *International Journal of Managing Projects in Business*, Vol. 7, No. 1, pp.61-77.
- Drury-Grogan, M. L. 2014. "Performance on agile teams: Relating iteration objectives and critical decisions to project management success factors". *Information and Software Technology*, Vol. 56, No. 5, pp.506-515.
- El-Sabaa, S. 2001. "The skills and career path of an effective project manager". *International journal of project management*, Vol. 19, No. 1, pp.1-7.
- Flyvbjerg, B. 2007. "Cost overruns and demand shortfalls in urban rail and other infrastructure". *Transportation Planning and Technology*, Vol. 30, No. 1, pp.9-30.
- Fortune, J. & White, D. 2006. "Framing of project critical success factors by a systems model". *International journal of project management*, Vol. 24, No. 1, pp.53-65.
- Gauthier, J. B. & Ika, L. A. 2012. "Foundations of project management research: an explicit and six-facet ontological framework". *Project Management Journal*, Vol. 43, No. 5, pp.5-23.
- Gelbard, R. & Carmeli, A. 2009. "The interactive effect of team dynamics and organizational support on ICT project success". *International Journal of Project Management*, Vol. 27, No. 5, pp.464-470.
- Gemünden, H. G., Lehner, P. & Kock, A. 2018. "The project-oriented organization and its contribution to innovation". *International Journal of Project Management*, Vol. 36, No. 1, pp.147-160.
- Ghoshal, S. 2005. "Bad management theories are destroying good management practices". *Academy of Management learning & education*, Vol. 4, No. 1, pp.75-91.
- Graeber, D. 2001. *Toward an anthropological theory of value: The false coin of our own dreams*, Springer.
- Hanisch, B. & Wald, A. 2012. "A bibliometric view on the use of contingency theory in project management research". *Project Management Journal*, Vol. 43, No. 3, pp.4-23.
- Henderson, L. S., Stackman, R. W. & Lindekilde, R. 2016. "The centrality of communication norm alignment, role clarity, and trust in global project teams". *International Journal of Project Management*, Vol. 34, No. 8, pp.1717-1730.
- Hobbs, B. & Besner, C. 2016. "Projects with internal vs. external customers: An empirical investigation of variation in practice". *International Journal of Project Management*, Vol. 34, No. 4, pp.675-687.
- Huemann, M. 2010. "Considering Human Resource Management when developing a project-oriented company: Case study of a telecommunication company". *International Journal of Project Management*, Vol. 28, No. 4, pp.361-369.

- Huemann, M., Turner, R. & Keegan, A. 2004. "Managing Human Resources in the Project-Oriented Company". *The Wiley guide to managing projects*, Vol., No. pp.1061-1086.
- Hutchinson, A. 1994. "Achieving a global engineering capability". *International Journal of Project Management*, Vol. 12, No. 1, pp.35-38.
- Joslin, R. & Müller, R. 2015. "New Insights into Project Management Research: A Natural Sciences Comparative". *Project Management Journal*, Vol. 46, No. 2, pp.73-89.
- Jugdev, K., Perkins, D., Fortune, J., White, D. & Walker, D. 2013. "An exploratory study of project success with tools, software and methods". *International Journal of Managing Projects in Business*, Vol. 6, No. 3, pp.534-551.
- Keegan, A., Huemann, M. & Turner, J. R. 2012. "Beyond the line: exploring the HRM responsibilities of line managers, project managers and the HRM department in four project-oriented companies in the Netherlands, Austria, the UK and the USA". *International Journal of Human Resource Management*, Vol. 23, No. 15, pp.3085-3104.
- Leavitt, H. J. 1964. "Applied Organisation Change in Industry: Structural, Technical and Human Approaches". *New Perspectives in Organisational Research*, John Wiley, Vol., No.
- Leavitt, H. J. 1965. *Applied organizational change in industry: Structural, technological and humanistic approaches*, New York.
- Lee-Kelley, L. & Turner, N. 2017. "PMO managers' self-determined participation in a purposeful virtual community-of-practice". *International Journal of Project Management*, Vol. 35, No. 1, pp.64-77.
- Lee, A. S. 1991. "Integrating positivist and interpretive approaches to organizational research". *Organization science*, Vol. 2, No. 4, pp.342-365.
- Lind, H. & Brunes, F. 2015. "Explaining cost overruns in infrastructure projects: a new framework with applications to Sweden". *Construction Management and Economics*, Vol. 33, No. 7, pp.554-568.
- Lizarralde, G., De Blois, M. & Davidson, C. 2011. "Relations intra-and inter-organisations for the study of the temporary multi-organisation in construction projects". *International Journal of Project Organisation and Management*, Vol. 3, No. 1, pp.57-77.
- Lyytinen, K. & Newman, M. 2008. "Explaining information systems change: a punctuated socio-technical change model". *European Journal of Information Systems*, Vol. 17, No. 6, pp.589-613.
- Macdonald, C., Walker, D. H. T. & Moussa, N. 2012. "Value for money in project alliances". *International Journal of Managing Projects in Business*, Vol. 5, No. 2, pp.311-324.
- Mintzberg, H. 2004. *Managers, not MBAs: A hard look at the soft practice of managing and management development*, Berrett-Koehler Publishers.
- Morgan, G. & London, S. 1998. "Images of organizations". *Human Resource Management Journal*, Vol. 8, No. 2, pp.93.
- Neves, F. G., Borgman, H. & Heier, H. Success Lies in the Eye of the Beholder: The Mismatch Between Perceived and Real IT Project Management Performance. System Sciences (HICSS), 2016 49th Hawaii International Conference on, 2016. IEEE, 5878-5887.
- Oppenheim, A. N. 2000. *Questionnaire design, interviewing and attitude measurement*, Bloomsbury Publishing.
- Orr, R., Scott, W., Levitt, R., Arto, K. & Kujala, J. 2011. "Global projects: distinguishing features, drivers, and challenges". *Global Projects: Institutional and Political Challenges*, Vol., No. pp.15-51.
- Orr, R. J. & Scott, W. R. 2008. "Institutional exceptions on global projects: a process model". *Journal of International Business Studies*, Vol. 39, No. 4, pp.562-588.
- Pmbok 2017. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Sixth edition*, Pennsylvania, USA, Project Management Institute, Incorporated.
- Pmi 2015. Pulse of the Profession 2015: Capturing the Value of Project Management. In: INSTITUTE., P. M. (ed.). Project Management Institute.
- Prince2 2017. *Managing Successful Projects with PRINCE2® 2017 Edition First Edition, Second Impression*, AXELOS.
- Rad, P. F. & Levin, G. 2003. *Achieving project management success using virtual teams*, J. Ross Publishing.
- Reich, B. H., Gemino, A. & Sauer, C. 2014. "How knowledge management impacts performance in projects: An empirical study". *International Journal of Project Management*, Vol. 32, No. 4, pp.590-602.
- Rescher, N. 1996. *Process metaphysics: An introduction to process philosophy*, Suny Press.
- Rolstadås, A., Tommelein, I., Morten Schiefloe, P. & Ballard, G. 2014. "Understanding project success through analysis of project management approach". *International Journal of Managing Projects in Business*, Vol. 7, No. 4, pp.638-660.

- Samset, K. & Volden, G. H. 2016. "Front-end definition of projects: Ten paradoxes and some reflections regarding project management and project governance". *International Journal of Project Management*, Vol. 34, No. 2, pp.297-313.
- Schiefloe, P. M. 2011. *Mennesker og samfunn. Innføring i sosiologisk forståelse*. 2. utgave. Bergen: Fagbokforlaget.
- Scott, R. W. 2003. *Organizations: Rational, Natural, and Open Systems*, Upper Saddle River, NJ, Pearson Education.
- Scott, W. R. & Davis, G. F. 2007. "Organizations and organizing". *Rational, Natural and Open Perspectives*, Vol., No.
- Shenhar, A. J., Dvir, D., Levy, O. & Maltz, A. C. 2001. "Project success: a multidimensional strategic concept". *Long range planning*, Vol. 34, No. 6, pp.699-725.
- Suprpto, M., Bakker, H. L. M. & Mooi, H. G. 2015. "Relational factors in owner–contractor collaboration: The mediating role of teamworking". *International Journal of Project Management*, Vol. 33, No. 6, pp.1347-1363.
- Söderlund, J. 2011. Theoretical foundations of project management: suggestions for a pluralistic understanding. In: MORRIS, P. W., PINTO, J. K. & SÖDERLUND, J. (eds.) *The Oxford handbook of project management*. Oxford: Oxford University Press.
- Tang, L. & Shen, Q. 2013. "Factors affecting effectiveness and efficiency of analyzing stakeholders' needs at the briefing stage of public private partnership projects". *International Journal of Project Management*, Vol. 31, No. 4, pp.513-521.
- Thomas, J., George, S. & Buckle Henning, P. 2012. "Re-situating expert project managers' praxis within multiple logics of practice". *International Journal of Managing Projects in Business*, Vol. 5, No. 3, pp.377-399.
- Ul Musawir, A., Serra, C. E. M., Zwikael, O. & Ali, I. 2017. "Project governance, benefit management, and project success: Towards a framework for supporting organizational strategy implementation". *International Journal of Project Management*, Vol. 35, No. 8, pp.1658-1672.
- Van De Ven, A. H. & Poole, M. S. 2005. "Alternative approaches for studying organizational change". *Organization studies*, Vol. 26, No. 9, pp.1377-1404.
- Van Der Hoorn, B. & Whitty, S. J. 2015. "Signs to dogma: A Heideggerian view of how artefacts distort the project world". *International Journal of Project Management*, Vol. 33, No. 6, pp.1206-1219.
- Verburg, R. M., Bosch-Sijtsema, P. & Vartiainen, M. 2013. "Getting it done: Critical success factors for project managers in virtual work settings". *International Journal of Project Management*, Vol. 31, No. 1, pp.68-79.
- Winter, M., Smith, C., Morris, P. & Cicmil, S. 2006. "Directions for future research in project management: The main findings of a UK government-funded research network". *International journal of project management*, Vol. 24, No. 8, pp.638-649.
- Young, R. & Poon, S. 2013. "Top management support—almost always necessary and sometimes sufficient for success: Findings from a fuzzy set analysis". *International journal of project management*, Vol. 31, No. 7, pp.943-957.
- Zwikael, O. & Globerson, S. 2004. "Evaluating the quality of project planning: a model and field results". *International Journal of Production Research*, Vol. 42, No. 8, pp.1545-1556.
- Zwikael, O. & Globerson, S. 2006. "From critical success factors to critical success processes". *International Journal of Production Research*, Vol. 44, No. 17, pp.3433-3449.
- Zwikael, O., Shimizu, K. & Globerson, S. 2005. "Cultural differences in project management capabilities: A field study". *International Journal of Project Management*, Vol. 23, No. 6, pp.454-462.

## APPENDIX – SURVEY QUESTIONS

**SQ1:** What is your current office location? In case you work in different offices, please specify where you spent more time in the last 3 months.

**SQ2:** Think about your current or last project. In which countries were/are your team members located? Consider the team members that communicate with you during meetings, using e-mails or any other media. Do not include other stakeholders, for example: suppliers, end users, customers, governmental agencies.

*SQ3 to SQ5 were later deemed not important to the scope of this study and were not analysed/described.*

**SQ6:** Think about the same project as the previous question. For each statement below, answer the following two questions:

How important is each statement to the success of your project? [Not important - Moderately important - Important - Very important - Critical]

To what extent does each statement describe the situation in your project? [Not at all - To a little extent - To a moderate extent - To a great extent - To a very great extent]

**SQ6.1** The project organizational structure is adapted to the specialization of the team members.

**SQ6.2** The project organizational structure is adapted to the geographical dispersion of the team members.

**SQ6.3** Effective processes exist for selection and training of the team members.

**SQ6.4** A Project Management Office provides support to the project manager.

**SQ6.5** Senior executives provide effective support to the project manager.

**SQ6.6** Senior executives define collaboration strategies with third parties during early stages.

*SQ7 to SQ10 were later deemed not important for the scope of this study and were not analysed/described.*

**SQ11:** How is your project cost (estimated total costs at completion), in comparison with the original budget?

1. Costs are +10% LOWER than original budget
2. Costs are between 1 and 10% LOWER than original budget
3. Costs are THE SAME as original budget
4. Costs are between 1 and 10% HIGHER than original budget
5. Costs are +10% HIGHER than original budget

**SQ12:** How is your project schedule, in comparison to the original plan?

1. Expected completion date is EARLIER than original plan
2. Expected completion date is THE SAME as original plan
3. Expected completion date is LATER than original plan

**SQ13:** How is your current project scope, in comparison to the original scope?

1. The scope was REDUCED, WITH IMPACTS on costs or schedule
2. The scope was REDUCED, WITHOUT IMPACTS on cost or schedule
3. The current scope is THE SAME as the original scope
4. The scope was INCREASED, WITHOUT IMPACTS on cost or schedule

5. The scope was INCREASED, WITH IMPACTS on costs or schedule

**SQ14:** Consider all projects conducted by your company in the last year, and situate your project in perspective to them. (Rate *Complexity, Budget, Duration, Team size, and Importance* on a Likert scale 1-5)

**SQ15:** To what extent do you face each of these challenges in your projects? [Not at all - To a little extent - To a moderate extent - To a great extent - To a very great extent]

- Geographical distance (locations in different countries)
- Multicultural collaboration (people from various cultures)
- Multilingual communication (people with different languages)
- Asynchronous interactions (people in various time zones)
- Cross-organizational relationships (people from various companies)

**SQ16:** What is your country of origin? (where you were born)

**SQ17:** Your current job is best described as? (Project team member, Project Manager, Programme Manager, PMO Manager, Senior Manager/Director or Academic position)

**SQ18:** In what type(s) of projects do you usually participate?

**SQ19:** What project management methods/bodies of knowledge do you use as a reference? (None,

PMBOK®, PRINCE2, IPMA ICB, APM-BOK or Other/Specify)

**SQ20:** What is your age?

**SQ21:** How many years of project management experience do you have?

**SQ22:** For how many years have you been working in projects that involve people from different countries?