

Progressing with Digital Transformation Endeavors - Towards Improved Governance

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List of Dissertation Papers

- Paper A Winter, R., Rohner, P., Kiselev, C. (2019). Mission Impossible? Exploring the Limits of Managing Large IT Projects and Ways to Cross the Line. *Proceedings of the 52nd Hawaii International Conference on System Science (HICSS 2019)*, Maui, USA.
- Paper B Kiselev, C., Winter, R., and Rohner, P. (2020). Project Success Requires Context-Aware Governance. *MIS Quarterly Executive* 19(3), 135-147.
- Paper C Kiselev, C. (2019). Digital Transformation Programs – Control in the Context of Agile and Traditional Approaches: A Multiple-Case Study. *Proceedings of the 13th Mediterranean Conference on Information Systems (MCIS 2019)*, Naples, Italy.
- Paper D Kiselev C., Winter, R. (2020). Governance of Mixed Agile/Traditional Digital Transformation Programs. *Proceedings of the 26th Americas Conference on Information Systems (AMCIS 2020)*, Salt Lake City, USA.
- Paper E Kiselev, C., Langenegger, P. (2021). Governance for a Multi-National ERP Program in a Decentralized Organization – How Arbonia Doors Set Up a “Glocal” Governance Enabling Both Local Differentiation and Global Consistency. In N. Urbach, M. Röglinger, K. Kautz, R.A. Alias, C. Saunders, M. Wiener (Eds.), *Digitalization Cases Vol. 2 – Mastering Digital Transformation for Global Business* (pp. 401-421). Cham: Springer International.
- Paper F Kiselev, C. (tbd). Designing Tension-Aware Program Governance: Learnings from an Action Design Research Study with Three Digital Transformation Programs. Institute of Information Management, University St.Gallen. Submission-ready.

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Summary

Today's organizations have to continuously transform themselves to survive in the rapidly changing environment. In particular, continuous, rapid developments of digital technologies are key drivers of these changes. They leave hardly any organization, even organizations with long traditions, unaffected. The resulting urge to progress with digital transformation has motivated many organizations to set up large-scale, enterprise-wide programs. However, successfully realizing these programs is far from an easy task. While program management as a discipline has significantly matured over the previous years, increasing the understanding of and improving program governance to ensure direction, coordination, and control of joint objectives in programs, has been neglected in both theory and practice.

This dissertation studies governance in digital transformation programs. Firstly, it investigates the importance of program governance as a means of ensuring program success. Secondly, it studies the current shortcomings of program governance in the context of the concurrence of opposing agile and traditional management approaches within programs and in the context of the concurrence of opposing local and global interests of involved stakeholders. Thirdly, it provides insights into possible improvements and further developments of program governance based on tension theory.

To gain rich empirical insights, all papers of this dissertation are based on a qualitative research approach.

The dissertation is of value for researchers and practitioners: The findings of the papers constituting this dissertation contribute to a better understanding of why governance is important to successfully progress with digital transformation endeavors and how it can be improved through ensuring both context- and tension-awareness. This dissertation lays the foundation to further investigate and develop governance practice in temporary organizations set up to progress with enterprise-wide digital transformation.

Keywords

Context, Digital Transformation, Governance, Management, Programs, Projects, Tensions

Zusammenfassung

Heutige Organisationen müssen sich kontinuierlich verändern, um in dem sich schnell verändernden Umfeld bestehen zu können. Schlüsseltreiber der Veränderungen sind vor allem die stetigen Entwicklungen von digitalen Technologien. Diese gehen an kaum einer Organisation, auch noch so traditionsreich, spurlos vorbei. Der resultierende Drang mit der Digitalen Transformation vorwärtszukommen, hat viele Organisationen dazu motiviert grosse, organisationsweite Programme aufzusetzen. Allerdings ist eine erfolgreiche Realisierung dieser Programme keine einfache Aufgabe. Während Programm Management als Disziplin in den letzten Jahren deutlich gereift ist, wurde der Aufbau eines besseren Verständnisses und die Verbesserung von Programm Governance als Führungs-, Koordinations-, und Steuerungsinstrument bei der Verfolgung von gemeinschaftlichen Programmzielen sowohl in der Theorie, als auch Praxis vernachlässigt.

Diese Dissertation erforscht Governance in Digitalen Transformationsprogrammen. Als Erstes untersucht sie die Wichtigkeit von Programm Governance als Mittel zur Sicherstellung des Programmerfolgs. Als Zweites erforscht sie die aktuellen Programm Governance Defizite im Kontext des Zusammentreffens von gegensätzlichen agilen und traditionellen Managementansätzen innerhalb eines Programms wie auch im Kontext des Zusammentreffens von gegensätzlichen lokalen und globalen Interessen der involvierten Stakeholder. Als Drittes, bietet sie Aufschluss über mögliche Verbesserungen und Weiterentwicklungen basierend auf der Tension Theory.

Um reichhaltige empirische Einblicke zu erhalten, basieren alle Artikel der Dissertation auf einem qualitativen Forschungsansatz.

Die vorliegende Dissertation ist für Forscherinnen und Forscher sowie Praktikerinnen und Praktiker wertvoll: Die Erkenntnisse der Artikel der Dissertation tragen dazu bei, ein besseres Verständnis, warum Governance für das erfolgreiche Vorankommen mit Digitalen Transformationsvorhaben wichtig ist und wie sie über Kontext- und Spannungsbewusstsein verbessert werden kann, aufzubauen. Diese Dissertation legt die Basis für die weitere Erforschung und Entwicklung von Governance Praktiken in - für das Vorankommen mit organisationsweiten Digitalen Transformationen aufgesetzten - temporären Organisationen.

Stichworte

Kontext, Digitale Transformation, Governance, Programme, Projekte, Spannungen

Part A: Synopsis

In part A, the research of this dissertation is introduced in terms of why it is relevant, what its purpose is, and how it was carried out (chapter 1). Next, the relevant concepts and related literature are outlined to allow a better understanding of the concepts and to position the research against existing knowledge gaps (chapter 2). Thereafter, the results from the six research papers are summarized (chapter 3) and critically discussed (chapter 4).

1 Introduction

New disruptive technologies such as artificial intelligence, robotics, blockchain, or virtual reality have led to digitalization that both motivates and pressures organizations to transform their business and IT. Organizations that want to thrive must embrace digitalization not only through re-thinking established business models and organizational logic but through actually transforming themselves. Over the years, digital transformation has matured from a fancy buzzword into a strategic imperative to staying competitive for organizations around the globe (Chanias, Myers, & Hess, 2019; Soh, Yeow, Goh, & Hansen, 2019). Currently, it is difficult to find a more pressing and discussed topic in practice.

While the motives (why) and content (what) of digital transformation are quite established in both research and practice, the process and progress (how) of digital transformation are less thoroughly understood (Berghaus & Back, 2017; Soh et al., 2019; Warner & Wäger, 2019).

After starting with small-scale innovation and IT projects, many organizations are now advancing their digital transformation via enterprise-wide programs aspiring to renew their business and IT (Ross, Beath, & Mocker, 2019). With growing budgets and manpower, especially large, traditional organizations are now increasingly setting up digital transformation programs to make a large-scale contribution to the needed enterprise-wide digital change. Nevertheless, research and practice have also shown that such programs are neither easy to realize nor always effective. On the contrary, many organizations fail partially or fully in realizing their aspired benefits (Shao, Müller, & Turner, 2012).

Because of the strategic weight, the considerable financial investments, and the manpower involved, the cost of failure can be very high for organizations (Kolf &

Kerkmann, 2018). As there is a highly professionalized and increasing project management capability in organizations (Martinsuo & Hoverfält, 2018; PMI, 2013), program governance has been moving increasingly into the focus in research and practice (Gregory, Keil, Muntermann, & Mähring, 2015; Müller, Zhai, Wang, & Shao, 2016; Volden & Samset, 2017). Program governance can be understood as a framework comprising measures of directing, coordinating, and controlling through which joint objectives can be defined and attained (Crawford et al., 2008; Imperial, 2005; Turner & Müller, 2003). Effective governance is seen as a means of ensuring that the “right things are done” (i.e., regarding program goals) and that “things are done right” (i.e., regarding program processes) (Jöhnk, Oesterle, Winkler, Nørbjerg, & Urbach, 2019; Pemsel & Müller, 2012; Williams & Karahanna, 2013). Thus, it allows program management to realize the aspired program benefits (Müller et al., 2016) (see Chapter 2.2).

In the context of digital transformation programs, there are, in essence, three relevant governance challenges due to three alignment problems arising from within the program and from outside the program, namely the context of the program (see Chapter 2.3).

In contrast to projects, because of their enterprise-wide scope, the context of programs is much broader (Pellegrinelli, 2011). A program’s context can influence its success (Shao & Müller, 2011; Shao et al., 2012). Hence, the first governance challenge is finding a way to align a program’s goals and processes with the given context.

Also arising from the program’s context, the second governance challenge refers to the convergence of various local and global stakeholders from the organizational context within programs (Boonstra, van Offenbeek, & Vos, 2017). Digital transformation programs are deliberately set up to ensure realizing both local and global benefits, which would not be possible to achieve through stand-alone projects (Lycett, Rassau, & Danson, 2004; Ross et al., 2019; Turner & Müller, 2003). Hence, adhering to this dual-benefits imperative within enterprise-wide programs becomes a governance challenge, especially when there is a long history of silo structures and local autonomy (Ross et al., 2019). In such a setting, local and global interests lead to tensions that need to be adequately addressed by governance to ensure realizing both local and global benefits

In contrast to projects, programs tend to be less specific regarding their outcome from the outset (Pellegrinelli, 2011; Turner & Müller, 2003). Moreover, there has been an increasing popularity of agile method applications beyond software development (Hobbs & Petit, 2017). This is why they have been infused by agile management ap-

proaches leading to a coexistence of agile and traditional change modes within a program (Conforto & Amaral, 2016; Gregory et al., 2015). The third governance challenge is thus finding a way to align and balance both change-driven (agile) and plan-driven (traditional) change modes that are inherently contradictory and that lead to tensions (Gregory et al., 2015; Jöhnk et al., 2019; Vejseli, Proba, Rossmann, & Jung, 2018).

1.1 Problem Statement and Research Objective

Program governance has been acknowledged as a key means to ensure effective program management and program success (Crawford et al., 2008). Although research on governance in the realm of digital transformation (Soh et al., 2019) and domain of programs (Gregory et al., 2015) has increased in both project management and IS literature over the previous years, knowledge on program governance is still less mature than knowledge on program management and digital transformation in general. Furthermore, there is a widespread lack of governance capability in practice in contrast to program management capability (Müller et al., 2016). It seems that the little existing research and practitioner literature on program governance has stagnated in the early phases of digitalization, where clearly definable local solution implementations and local optimizations were the focal topics (Ross et al., 2019), where a traditional top-down approach (Harris, Collins, & Hevner, 2009; Theocharis, Kuhrmann, Münch, & Diebold, 2015), unitarist thinking, and linear rationality (Boonstra et al., 2017) emphasizing mechanistic steering processes and clearly cut either-or decisions were still suitable.

To further motivate governance research, as a first step, this dissertation aims to better understand why program governance is important for effective program management in digital transformation (RQ1). Against the background of the above-outlined governance challenges and the lack of adequate, up-to-date governance approaches, the second step is to investigate how the shortcomings of existing governance practice manifest within digital transformation programs (RQ2). The third step is to identify and propose ways to improve program governance for digital transformation programs (RQ3). In doing so, this dissertation's research is also expected to contribute to a new agenda for future governance research and improved governance practice in the era of digital transformation.

1.2 Research Approach

Overall, with the aim of this dissertation being to improve existing governance, the research conducted follows a design science paradigm. Over the years, there has been an

increasing interest in this paradigm as it has great potential to combine both relevance and rigor within the research (Gregor & Hevner, 2013; Winter & Aier, 2016). Design science research aims to complement explanations of problems with solutions that transform and improve organizational practice (Denyer, Tranfield, & van Aken, 2008; Hevner, March, Park, & Ram, 2004). The different papers contribute in various ways to the design science research process, according to (Peppers, Tuunanen, Rothenberger, & Chatterjee, 2007). The applied research methods for understanding a problem, developing objectives of a solution, design, and evaluation were all of qualitative nature. Table 1 shows the applied research methods per paper and the corresponding primary motive.

<i>Table 1. Applied Research Methods</i>		
Paper	Applied Research Method	Primary Motive
A	Multiple case study (semi-structured interviews, study of documents) Focus group workshops	To identify the problem and motivate; to explore the objectives of the solution to design, implement, and evaluate an analysis framework.
B	Multiple case study (semi-structured interviews, study of documents) Focus group workshops	To deepen the understanding of the problem; to refine the objectives of the solution; to develop recommendations
C	Triple case study (semi-structured interviews, study of documents)	To identify the problem and motivate
D	Dual case study (semi-structured interviews, study of documents) Focus group workshops	To deepen the understanding of the problem; to explore objectives of a solution; to develop requirements
E	Action design research (semi-structured interviews, focus group workshop)	To rigorously design a useful solution
F	Action design research (literature analysis, semi-structured interviews, focus group workshop)	To rigorously design a useful solution

2 Conceptual Foundation and Related Research

This section provides an overview of the relevant concepts and positions the research against existing knowledge gaps.

2.1 Programs as a Means to Progress with Digital Transformation

Digital transformation has become a key concern for the majority of organizations, “[...]given the transformative impacts of digital technologies on almost all aspects of an organization’s inner and outer environment” (Chanias et al., 2019, p. 17). Hence, digital transformation has evolved into a strategic imperative on top-management agendas (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2014; Svahn, Mathiassen, & Lindgren, 2017). Many organizations are pressured to find ways to capitalize on new opportunities based on new digital technologies to stay competitive (Rogers, 2016). These new digital technologies “[...]enable major business improvements such as enhancing customer experience, streamlining operations, or creating new business models” (Fitzgerald et al., 2014, p. 2) and can transform an enterprise’s value proposition, operations, and competitive environment (Matt, Hess, Benlian, & Wiesbock, 2016).

In contrast to so-called “born-digital” organizations, such as Amazon or Alphabet, most well-established, traditional organizations need to change many parts of or even the entire organization, renew processes, and develop new business models to leverage digital technologies (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). For such organizations, digital transformation can be understood as a holistic transformation of the organization, bringing about fundamental technological and business changes (Besson & Rowe, 2012; Chanias et al., 2019). As put forward by Chanias et al. (2019, p. 17) the “[...] scope [of digital transformation] goes beyond the digitization of resources and involves the transformation of key structural and organizational aspects and the use of advanced information technologies or aspects of value creation including key products and services, leading to adjusted or completely new business models.”

Having to consider advantages in digital technologies and realizing changes in business models, organizational processes, and structures is a great challenge for organizations, not only regarding laying the strategic foundation (Hess, Matt, Benlian, & Wiesbock, 2016), but also regarding its realization process, or in other words, how digital transformation can be successfully realized (Singh & Hess, 2017). Contrary to other forms of strategic change or transformation, the involved digital technologies increase the pace

of change, which leads to higher volatility, uncertainty, and complexity in the digital transformation process (Matt, Hess, & Benlian, 2015). Furthermore, the process of digital transformation has to go beyond single functional perspectives and comprehensively consider transformative actions needed on a local and global level (Ross et al., 2019; Singh & Hess, 2017). Although existing research has started to intensively investigate what successful digital transformation entails (Matt et al., 2016), the novelty of the phenomenon in practice still offers a lot of research and learning opportunities, especially regarding the realization process (Berghaus & Back, 2017; Warner & Wäger, 2019) and organizational vehicles set up to progress with digital transformation (Barthel & Hess, 2020).

While digital transformation can be understood as an ongoing process incorporating business, organizational, and technological changes, it most likely at some point requires being organized and managed through a temporary organization to make a coordinated leap from a current to a, at least temporary, target state through enclosing all local projects and activities that are related to achieving a specific enterprise-wide digital transformation outcome (Martinsuo & Hoverfält, 2018). Against this background, programs are a suitable and often used means to progress with digital transformation (Barthel & Hess, 2020).

Nevertheless, practitioners have been labeling temporarily organized digital transformation endeavors differently—according to prevailing terminology and understanding (Pellegrinelli, Murray-Webster, & Turner, 2015). A closer look often reveals that the terms used, such as *digital transformation initiative* or *large-scale IT projects*, can actually refer to digital transformation realized through a program (Martinsuo & Hoverfält, 2018).

As long as an endeavor is more than a scaled-up version or large project and rather a vehicle for realizing an enterprise-wide IT and business change (Barthel & Hess, 2020) it can be understood as a digital transformation program. This is why, although termed as large-scale IT projects in papers A and B, the investigated endeavors are understood as programs at least partially contributing to digital transformation.

With programs emerging as a recognized means to realize strategic change and enterprise-wide benefit in practice and literature (Pellegrinelli et al., 2015), programs and the associated program management have evolved into a distinct field of research within IS (Gregory et al., 2015) and project management literature (Pellegrinelli, 2011). While the characteristics of programs have been intensely studied to increase clarity regarding the

concept (Pellegrinelli, 2011; Shao et al., 2012), there are fewer studies and thus insights on how they can be successfully realized (Shao et al., 2012). With many organizations struggling to realize programs, such as digital transformation programs (Barthel & Hess, 2019) this knowledge gap needs to be filled.

2.2 Program Governance

Governance has been defined as crucial to enterprise-wide transformation's success (Crawford et al., 2008; Harmsen, Proper, & Kok, 2009; Weill & Ross, 2004) and successful digital transformation in particular (Ross et al., 2019). Nevertheless, the concept is still fuzzy and difficult to define.

Both governance research in project management and IT domains rely on governance conceptualizations rooted in corporate governance. IT governance as well as program governance are understood as crucial means to realize business value (Ahola, Ruuska, Arto, & Kujala, 2014; De Haes, Van Grembergen, Joshi, & Huygh, 2020). With programs being temporary organizations, program governance inherently refers to realizing the aspired benefits within a given time (Müller et al., 2016) no matter whether the object of change is IT, business, or both within an organization. IT governance has a clear focus on "[...]business/IT alignment, and the creation and protection of IT business value" (De Haes et al., 2020, p. 3). Moreover, with the rise of digital transformation, the focus of IT governance has changed towards value generation in digitalized organizations (Caluwe, De Haes, Wilkin, & Huygh, 2021). Although IT governance is not necessarily time-bound (Harmsen et al., 2009) IT governance conceptualizations can still inform governance of digital transformation programs because of their strong reference to business and IT change, the object of digital transformation (Caluwe et al., 2021; Ross et al., 2019). This is why, the governance conceptualizations used in this dissertation are informed by both project management and IS literature. In accordance to both research fields, effective governance is seen as a means of ensuring that the "right things are done" (i.e., regarding program goals) and that "things are done right" (i.e., regarding program processes) (Jöhnk et al., 2019; Pemsel & Müller, 2012; Williams & Karahanna, 2013). Governance of digital transformation programs is understood a set of measures of directing, coordinating, and controlling (Crawford et al., 2008; Imperial, 2005; Turner & Müller, 2003) through which joint digital transformation objectives can be defined (e.g., decision-making) and attained (e.g., monitoring).

Furthermore, existing research in the project management and IT domain shows that scholars either focus on governance in a narrower or a broader sense. Research focusing on the narrower understanding typically studies the role of specific steering actors and bodies within a (temporary) organization (e.g., program owners or steering committees) (Caluwe & De Haes, 2019; Lechler & Cohen, 2009). Research using a broader conceptualization of governance typically studies a wide variety of governance (Ahola et al., 2014; De Haes & Grembergen, 2008; Müller, Pemsel, & Shao, 2014). From a broader perspective, governance can entail structural and procedural measures (De Haes & Grembergen, 2008). While structural measures refer to, for instance, program set up and roles and responsibilities (Ahola et al., 2014; De Haes & Grembergen, 2008; Müller et al., 2014), procedural measures refer to decision-making and control processes (De Haes & Grembergen, 2008; Peterson, Parker, & Ribbers, 2002). Furthermore, governance can also entail relational measures (Pemsel & Müller, 2012) such as participatory activities, collaboration, shared understanding and joint commitments (Jöhnk et al., 2019). As De Haes and Grembergen (2008) emphasized, it is the mix of the different types of measures that makes a governance work. Program governance thus refers to a broad set of governance measures ensuring direction and control (Ahola et al., 2014; Turner & Keegan, 2001) and steering governance is a specific element of program governance.

In this dissertation, the narrow and broad governance conceptualization are used. Papers A and B mainly focus on the narrower understanding (i.e. steering governance as one specific of program governance). The remaining papers apply the broader understanding of governance and thus focus on program governance. The reason for moving to a broader conceptualization lies in the possibility of finding more governance measures that should be improved.

With control being a recognized as central element of governance (Ahola et al., 2014; Turner & Keegan, 2001; Williamson, 1999), it is not surprising that existing research in both IS, and project management shows a convergence of the concepts of governance and control (Saunders, Benlian, Henfridsson, & Wiener, 2020; Wiener, Mähring, Remus, & Saunders, 2016). Some researchers treat the two terms as synonyms (Sandberg, Holström, & Lyytinen, 2020; Saunders et al., 2020). The research at hand does not use control and governance as synonyms, but it applies control theory to further understand control as a central element of governance (paper C and paper D).

While existing research has underlined the relevance of program governance (Müller et al., 2014; Shao et al., 2012) and thoroughly disassembled governance in terms of what measures and mechanisms it entails (De Haes & Grembergen, 2008; Williamson, 1999),

there is still a lack of knowledge on what it is and why it is actually important to ensure program management effectiveness in programs and digital transformation programs in particular. Moreover, existing governance literature offers few clues to where improvement of governance should be set in and how improved program governance in the realm of digital transformation should look like. The existing body of knowledge in both practice and research still emphasizes traditional governance concepts, which are characterized by top-down, unitarist, and linear thinking (Boonstra et al., 2017). Against the background of contextual embeddedness as well as the ambiguous and pluralistic nature of programs (Pellegrinelli, 2011), and the lack of insights into how governance can adhere to the enterprise-wide reality digital transformation programs, the author claims that there is a need for re-thinking and even re-designing program governance.

2.3 Alignment Problems Arising from Within and Outside the Program

To re-think and re-design governance, the research at hand considers three alignment problems: the alignment of the program and its context (governance challenge I), the alignment of local and global interests (governance challenge II), and the alignment of agile and traditional change (governance challenge III) within programs (see Table 2).

The context of a program can be understood as the organizational, political, and technological environment in which a program is embedded and program management has to operate in without having any influence (Pellegrinelli et al., 2015). Existing research has shown that the context influences a program's success and that effective management approaches should be adaptable to contextual changes (Shao & Müller, 2011; Shao et al., 2012). While it has been claimed that context consideration is a distinct program governance task, it has not been thoroughly studied which contextual factors should be considered, especially in digital transformations, and how context consideration, understood as alignment of the program and its context, should be done through governance measures. Hence, the first governance challenge studied in this dissertation is program/context alignment (alignment challenge I). Research on this challenge started with investigating contextual factors (paper A) and what is needed to increase context-awareness through governance actors and bodies (i.e., steering governance) (paper B).

When moving from this broad consideration of the program context to a narrower one, another alignment problem arises. Due to the enterprise-wide scope of digital transformation programs, considering the plurality of local and global stakeholders embedded

within the organizational context with their specific local and global change interests becomes relevant (Ross et al., 2019). Especially for programs embedded in decentralized organizations with silo structures and strong local autonomies, it becomes a challenge to adhere to the mutual local and global benefits realization imperative inherent to enterprise-wide programs (Pellegrinelli, 2011; Ross et al., 2019). With at least parts of local and global stakeholders typically becoming actors with competing local and global demands regarding program goals and organizing, local/global tensions will eventually arise within programs. Thus, to ensure a balance between local and global benefits local and global interests need to be aligned through suitable, tension-aware governance measures (governance challenge II).

With programs tending to be less specific regarding their outcome from the outset (Pellegrinelli, 2011; Turner & Müller, 2003) and the increasing popularity of agile methods beyond software development (Hobbs & Petit, 2017), in many organizations, there is a coexistence of agile and traditional approaches (Gregory & Keil, 2014). This coexistence leads to competing demands regarding change process and outcome eventually leading to tensions (Aghina, De Smet, & Weerda, 2015; Soh et al., 2019). Hence, to stay on track and even leverage the advantages of agile and traditional approaches, governance should align and balance change-driven (agile) and plan-driven (traditional) change modes (governance challenge III) in a tension-aware manner.

<i>Table 2. Governance Challenges and Alignment Problems</i>			
Governance Challenge	Alignment Problem	Corresponding Paper	
I	Program/Context Alignment	A	B
II	Local/Global Alignment	E	F
III	Agile/Traditional Alignment	C	D

Regarding tension-awareness, in line with the more general findings of organizational studies (Jarzabkowski, Lê, & Van de Ven, 2013; Smith & Lewis, 2011), both IS and project management scholars have shown that finding an active approach towards tensions and seeking a balance between contrasting demands regarding change is a promising governance strategy (Staub, 2021; Wareham, Fox, & Cano Giner, 2014). Nevertheless, research that links governance of DTP with the findings of tension theory is still scarce.

Against this background, this dissertation's research also investigates what is needed to increase tension-awareness through program governance in the context of agile/traditional (paper C and Paper D) and local/global tensions (paper E and paper F).

3 Results

The posed research questions are addressed through six research papers. Table 3 displays how each paper contributes to answering each research question. In the following sections, 3.1. to 3.6., the main content of the research papers is outlined.

<i>Table 3. Research Paper's Contribution to Research Questions</i>				
Paper/Title		RQ1	RQ2	RQ3
A	Mission Impossible? Exploring the Limits of Managing Large IT Projects and Ways to Cross the Line	●	◐	◐
B	Project Success Requires Context-Aware Governance	◐	●	●
C	Digital Transformation Programs – Control in the Context of Agile and Traditional Approaches: A Multiple-Case Study	○	◐	○
D	Governance of Mixed Agile/Traditional Digital Transformation Programs	○	●	◐
E	Governance for a Multi-National ERP Program in a Decentralized Organization (abbr.)	○	◐	◐
F	Designing Tension-Aware Program Governance: Learnings from an Action Design Research Study with Three Digital Transformation Programs	○	●	●
○ No answer to RQ ◐ Partial answer to RQ ● (One) Main answer to RQ RQ1 Why is program governance important for effective program management in DTP? RQ2 How do shortcomings of existing governance practice manifest within DTP? RQ3 How can program governance be improved for DTP?				

Concerning the tripartite focus on governance challenges (see Chapter 2.3), RQ2 and RQ3 can each be further specified by complementing (1) “regarding program/context alignment,” (2) “regarding local/global alignment,” and (3) “regarding agile/traditional alignment.” Thus, the contribution extent indicated for RQ2 and RQ3 refers to (1) with regards to paper A and B, to (2) with regards to paper E and F, and to (3) with regards to paper D.

3.1 Paper A

Citation

Winter, R., Rohner, P., Kiselev, C. (2019). Mission Impossible? Exploring the Limits of Managing Large IT Projects and Ways to Cross the Line. Proceedings of the 52nd Hawaii International Conference on System Science (HICSS 2019), Maui, USA.

Research Objective

Paper A aims to improve the understanding of the failures and successes of large, complex IT projects by developing and applying a co-designed project analysis framework.

Research Method

The development of the project analysis framework was done based on an initial case study of 15 failed IT projects of the Swiss Federal Administration. Data collection was based on interviews with several actors of each project and project documents such as project proposals, controlling reports, and meeting minutes. Thereafter, we worked with focus groups consisting of practitioners with great experience with large, complex IT projects to co-design our analysis framework. We then applied the final analysis framework to the failed 15 IT projects. In the end, we developed countermeasures for the problems identified and evaluated them regarding relevance and feasibility through a workshop with 40 practitioners.

Results

The co-design phase yielded a project analysis framework consisting of two project success dimensions: project context assessment and project method compliance. For each dimension, we developed an assessment instrument consisting of 37 and 22 items with a qualitative assessment scale ranging from 0 to 5, allowing deriving an overall score regarding project management compliance and project context assessment. The application of the analysis framework showed that there are projects that failed despite well-functioning project management. Four out of fifteen projects failed because of adverse contextual factors, which are beyond the scope of project management. The developed countermeasures refer to building up capabilities to improve context-sensitivity within project management and governance, only launching projects embedded within a good context, upgrading project management and governance as recognized disciplines within the organization.

Contribution to the Dissertation

Paper A provides insights into why large, complex IT projects can fail. It goes beyond project management and recognizes adverse contextual factors as reasons for project failure despite well-functioning project management. The understanding gained through this initial work motivated the in-depth study of project governance and its potential to establish context-awareness (paper B) and conduct further research to better understand and improve governance practice (paper C-F).

3.2 Paper B

Citation

Kiselev, C., Winter, R., and Rohner, P. (2020). Project Success Requires Context-Aware Governance. *MIS Quarterly Executive* 19(3), 135-147.

Research Objective

Based on our findings in paper A, we aimed to identify challenges on the project governance level and develop recommendations for implementing context-aware governance.

Research Method

To identify project governance challenges, we conducted an in-depth study of four large and complex failed IT projects in the Swiss Federal Administration. Data collection was based on semi-structured interviews with various project actors and available project documents. The questionnaire to assess how actors on the program governance level influenced the contextual factors was based on the analysis framework developed in paper A and complementary findings in the literature and answered by project actors.

Results

The in-depth analysis of how project governance actors dealt with contextual challenges shows that there were shortcomings along five contextual factors (i.e., terrain, dynamics, complexity, commitment, and ability to act).

Contribution to the Dissertation

Paper B provides a deeper empirical understanding of the importance of program governance for establishing context-awareness within projects. Moreover, it further develops the initially derived countermeasures against the lack of context-awareness (paper A) and provides refined recommendations and thus insights on how governance can be

made more context-aware and thus improved. These insights on context-aware governance particularly motivated papers E and F.

3.3 Paper C

Citation

Kiselev, C. (2019). Digital Transformation Programs – Control in the Context of Agile and Traditional Approaches: A Multiple-Case Study. Proceedings of the 13th Mediterranean Conference on Information Systems (MCIS 2019), Naples, Italy.

Research Objective

In paper C, the author tried to better understand how traditional and agile components are managed within digital transformation programs in terms of control and what control tensions arise.

Research Method

To explore control and the corresponding tensions when agile and traditional approaches come together within a digital transformation program, the author conducted a multiple-case study with three case programs. Data collection was based on semi-structured interviews with program managers and the program management officer, informal e-mail and telephone conversations, and secondary data (i.e., publicly available and internal material on the programs). The data analysis was guided by tension theory and theory on ambidexterity.

Results

The study revealed that all case programs lacked a suitable program management and control methodology for their agile/traditional program settings. In terms of control, it could be shown that the more agile components there are within a program, the more enabling control is enacted, and the more control tensions are reported. The identified control tensions across all cases refer to stability vs. change in outcome definition, resource planning, and reporting.

Contribution to the Dissertation

Paper C provided insights on how traditional and agile components are combined within a program, how they are managed in terms of control, and what kind of tensions can be expected in an agile/traditional program setting. It provided the motivation to deepen our understanding of how governance for agile/traditional digital transformation programs could be improved (paper D).

3.4 Paper D

Citation

Kiselev C., Winter, R. (2020). Governance of Mixed Agile/Traditional Digital Transformation Programs. *Proceedings of the 26th Americas Conference on Information Systems (AMCIS 2020)*, Salt Lake City, USA.

Research Objective

The purpose of Paper D was to explore the challenges arising from governance tensions in agile/traditional digital transformation programs and derive requirements for enhanced digital transformation program governance practice.

Research Method

To gain rich qualitative data allowing us to explore tensions in mixed agile/traditional digital transformation programs, we conducted a dual-case study. Data collection was based on 13 semi-structured interviews with actors on the program governance level and actors on the program management level. Secondary data was used for triangulation of the interview results. Moreover, two focus group workshops with representatives of each case program were conducted to further triangulate and evaluate our findings. The data analysis was guided by tension theory and theory on ambidexterity.

Results

Our study identified 18 tensions (e.g., high vs. low delivery cadence or flexible vs. fixed plans) across five tension domains (i.e., delivery process, plan and resources, team operations, goals, and strategy) and 17 corresponding governance challenges (e.g., need for two decision-making speeds or matching backlogs and classic project plans). Moreover, ten requirements for “change-mode-agnostic” governance could be derived (e.g., stressing the importance of the coexistence of traditional and agile components or combining working with milestones and joint commitments).

Contribution to the Dissertation

Paper D contributed to a better understanding of how governance of digital transformation programs with agile and traditional components could be improved to address the challenges arising from various tensions.

3.5 Paper E

Citation

Kiselev, C., Langenegger, P. (2021). Governance for a Multi-National ERP Program in a Decentralized Organization – How Arbonia Doors Set Up a “Glocal” Governance Enabling Both Local Differentiation and Global Consistency. In N. Urbach, M. Röglinger, K. Kautz, R.A. Alias, C. Saunders, M. Wiener (Eds.), *Digitalization Cases Vol. 2 – Mastering Digital Transformation for Global Business* (pp. 401-421). Cham: Springer International.

Research Objective

The objective of paper E was to report how specific governance measures were designed and implemented within a real-life enterprise-wide transformation program to balance local and global interests. Moreover, paper E aimed to show how this set of governance measures enabled both local differentiation and global consistency in goal definition and realization and how the associated risks for the program could be addressed.

Research Method

The design and implementation of governance measures were done during an action design research project with a manufacturing company launching an enterprise-wide ERP program. It contained various rounds of interviews and focus group workshops on understanding the problem and developing and evaluating the solution (i.e., set of governance measures).

Results

Paper E provides insights on nine jointly with the manufacturing company developed governance measures ranging from setting up “glocal” roles and responsibilities to regular community-building meetings. It further showed that the set of governance measures led to program improvements in reducing governance challenges and facilitated laying a solid foundation for further digital transformation. This single case result report can be seen as a valuable complement to the more summative triple case result report of paper F.

Contribution to the Dissertation

Paper E offered the first insight into how enhanced governance can actually be designed and how the design and implementation of a set of governance measures can positively contribute to governance that balances local change differentiation and global change consistency. It can be seen as a preliminary step to paper F, which analyses and synthesizes tension-aware governance design knowledge gained from an action design research project with three case programs.

3.6 Paper F*Citation*

Kiselev, C. (tbd). Designing Tension-Aware Governance: Learnings from an Action Design Research Study with Three Digital Transformation Programs. Submission-ready.

Research Objective

Paper F aimed at developing design principles for tension-aware program governance for programs striving for both local change differentiation and global change consistency in a tension-prone setting

Research Objective

Paper F aimed to develop design principles for tension-aware program governance for programs striving for both local change differentiation and global change consistency in a tension-prone setting.

Research Method

The results presented in this paper emerged from an action design research project conducted by the author and the teams of three digital transformation programs, each embedded in a different traditional organization during a period of 20 months. The action design research process consisted of case studies and various rounds of interviews and focus group workshops on understanding the problem and developing and evaluating design principles.

Results

Paper F highlights the process of designing, implementing, and evaluating three program governance interventions that are more efficient and effective than existing governance interventions in balancing local change differentiation and global change consistency in a tension-prone setting. Six design principles were developed based on the concurrent

synthesis of three context-sensitive real-life interventions and insights from existing governance and tension theory.

Contribution to the Dissertation

Paper F contributed to the dissertation by providing the aspired design knowledge enhancing program governance. It transforms the theoretical and empirical insights on tensions and governance gained during the dissertation journey into prescriptive knowledge.

4 Discussion and Conclusion

For many organizations, especially traditional ones, successfully realizing digital transformation programs is a major challenge. While well-functioning program management plays an important role, program governance also plays a pivotal role in successful progress with programs (Gregory et al., 2015; Harmsen et al., 2009). Whereas program management has undergone professionalization in practice and received a lot of research attention (Martinsuo & Hoverfält, 2018; PMI, 2013) over the recent years, program governance still seems to be less mature and even outdated in practice and far less studied. Hence, there is a need to increase the understanding and improve program governance to ensure direction, coordination, and control of joint objectives in programs.

In the remaining chapter, the dissertation's main theoretical and practical contributions and limitations are pointed out, and possible avenues for future research are suggested.

4.1 Theoretical Contribution

This dissertation aims at re-thinking and re-designing governance of digital transformation programs. The research conducted considers three alignment problems that are especially pronounced in digital transformation programs in traditional organizations and relevant to their governance: the alignment of the program and its context (governance challenge I), the alignment of local and global interests (governance challenge II, and the alignment of agile and traditional change (governance challenge III) within programs.

The research at hand started with the study of why program governance is important for effective program management. It is revealed that it is because of its ability to ensure the adequate consideration of a program's context on which program management has no influence but because of which even well-managed programs can fail. These findings motivated to further study program/context alignment (governance challenge I) as a shortcoming of existing program governance.

While one part of the research focuses on program governance shortcomings regarding program context consideration, the other part of the research focuses on governance shortcomings in relation to another phenomenon: the coexistence of agile and traditional management approaches within digital transformation programs and the corresponding alignment problems (governance challenge III). The identified shortcomings regarding

governance challenge III led to first insights on how governance of digital transformation programs with agile and traditional components could be improved (i.e. how to address the challenges arising from various corresponding agile/traditional tensions). Nevertheless, it did not go further than deducing the first requirements for enhanced governance. On the other hand, research regarding context consideration yielded the notion of context-aware program governance and insights on how it could be improved in general. In particular, it focused on local/global alignment (governance challenge II), that is especially challenging in decentralized organizational contexts typical for traditional organizations. Also within this focus, shortcomings of existing program governance were revealed and used as a basis to develop tension-aware governance to balance local and global interests. In this research part, the insights on how to improve program governance went as far as developing nascent design knowledge in the form of design principles for tension-aware program governance to balance local and global change interests within a digital transformation program.

Paper A and B offer valuable insights into why program governance and, in essence, steering governance, is important for effective program management in digital transformation programs (RQ1) by investigating failed endeavors. While existing findings regarding the general importance of steering governance for program or project success could be confirmed, the studies deepen the understanding of the relevance of a program's context and its consideration through governance for program management effectiveness.

In terms of governance shortcomings (RQ2), paper B contributes to existing research, which has primarily focused on which contextual factors influence program management effectiveness or success (Shao & Müller, 2011) through offering insights into how the context of failed programs had been neglected by program governance actors and bodies (i.e. steering governance). Paper C and D deepen the still poor understanding of the consequences of the coexistence of agile and traditional management approaches in general and for program governance (in a broader sense) and control (in a narrower sense) within digital transformation programs. Finally, papers E and F deepen the still nascent understanding of governance shortcomings regarding local/global tensions in the realm of digital transformation. It is shown that existing governance approaches are obsolete when aspiring a balance between local change differentiation and global change consistency.

In terms of possible governance improvements (RQ3), especially paper B and F contribute to existing research by providing insights in the recognized need for governance

improvement (Gregory et al., 2015; Ross et al., 2019; Wareham et al., 2014), which can actually be achieved through context-awareness and tension-awareness.

The results derived not only contribute to a better understanding of the role of digital transformation governance and how it can be improved, they also help to advance the existing body of knowledge regarding digital transformation in general (Soh et al., 2019) or other governance domains where agile/traditional or local/global tensions might arise and pose challenges like already acknowledged in ecosystem and organizational network research (Provan & Kenis, 2008; Staub, 2021; Wareham et al., 2014).

Moreover, this dissertation's research contributes to the still emerging research stream that applies tension theory to digital transformation (Soh et al., 2019), in particular, digital transformation programs, as well as to governance (Provan & Kenis, 2008; Wareham et al., 2014), in particular, digital transformation program governance (Boonstra et al., 2017). The results deepen the understanding of tensions and provide valuable insights on the applicability of tension theory to better understand organizational constructs and change as well as to enhance organizational designs. Furthermore, the conducted action design research has the potential to provide valuable insights to researchers on how to conduct collaborative design research.

4.2 Practical Contribution

In line with the expectations of many practitioners, the author had discussions with while conducting her research, the author is convinced that digital transformation will continue to concern executives for many years to come. This dissertation is valuable to practitioners seeking insights to better understand and improve digital transformation programs and the corresponding program governance practice.

First, it offers rich insights and thus learning opportunities from in-depth case analyses (provided by all papers). The presented failure (e.g., paper A and paper B) and success stories (e.g., paper E) can, in particular, serve as motivation to improve digital transformation capability through program governance enhancement.

Second, it offers actionable recommendations and valuable specific measures to establishing context-aware governance in general and tension-aware governance in mixed agile/traditional digital transformation programs. This provides both inspiration and guidance to enhance program governance.

Third, the dissertation provides rigorously designed and evaluated design principles that are ready to use to guide the design of tension-aware governance for balancing local and

global interests as well as a project success model and method readily usable to assess projects respectively programs.

The study offers first-hand insights into how existing program governance practice can be improved to consciously balance conflicting interests. It not only gives generalized, abstract guidance in the form of design principles, but it also provides inspiration for how these design principles can be translated through offering insights into the design decisions (i.e., governance interventions) taken.

4.3 Limitations and Future Research Avenues

The limitation of this research can be seen from a general perspective and from the perspective of each paper constituting this dissertation. As the latter limitations are outlined in each paper, in the following, the author refers to the general limitations of this dissertation.

From a general perspective, the limitation of this dissertation can be related to the broad approach towards the research problem as well as the applied research approach and data collection.

The research at hand was primarily driven by problems observed in practice. This led to an open and thus broad approach towards the topic of governance of digital transformation programs. With the intention of grasping the major governance challenges, the research started, for instance, with investigating governance both in the context of the coexistence of agile and traditional approaches and in the context of the coexistence of local and global interests. Only with time did it become clear that the research part regarding local/global tensions offers a more valuable opportunity to develop prescriptive knowledge. In retrospect, the dissertation could have been narrowed down earlier. This would have possibly enabled the author to get more specific insights on a more specific research problem.

Other limitations arise from the qualitative research approach and the case sampling applied across all papers. A qualitative research approach clearly suits answering the posed research questions (i.e., why and how questions) and enabled exploration and deriving a deep understanding of organizational phenomena in their real context (Yin, 2009). The small number of cases investigated and the use of interviews and focus group workshops to gather data limit generalizability and multi-perspectivity. Moreover, the case sample is not free of possible selection bias. Hence, the research at hand could be complemented by further qualitative research.

In addition to the future research suggestion derived from the limitations of this dissertation, the field is still wide open for other further contributions.

Based on the promising results and the solid existing knowledge regarding tension theory in general, future research could continue to apply the tension lens to program governance research. A valuable contribution could be investigating the dynamics and interrelatedness of tensions and their impact on DTP and the corresponding governance structures and processes. Future research could study how program governance could be adapted in response to changing and evolving tensions and tension relationships.

Furthermore, it would be interesting to deepen the insights on the interplay of governance interventions and their effect on governance effectiveness. Therefore, future research could study the effectiveness of program governance intervention mixes over time.

Finally, based on the positive experiences made through the studies at hand, the author suggests that researchers conduct more design-oriented research and collaborative research, such as action design research, in particular, to ensure rigor and relevance in the future.

Part B: Dissertation Papers

In Part B includes six research papers. The text of the papers is equivalent to the original publication, which leads to some inconsistencies regarding the terms used. Each paper is presented in a re-formatted, more harmonic form (i.e. aligned font style and size, tables and figures, and citation style) to increase readability.

Paper A – Mission Impossible? Exploring the Limits of Managing Large IT Projects and Ways to Cross the Line

Table 4. Bibliographical Metadata Paper A

Title	Mission Impossible? Exploring the Limits of Managing Large IT Projects and Ways to Cross the Line
Author	Winter, Robert; Rohner, Peter; Kiselev, Caroline Institute of Information Management, University of St. Gallen St. Gallen, Switzerland
Selected approach for order of authors	Sequence determines credit
Publication outlet	Proceedings of the 52 nd Hawaii International Conference on System Science (HICSS 2019), Maui, USA.
Publication type	Conference Paper
Publication year	2019
Publication status	Published

Abstract

For decades much effort has been made to improve project management capabilities. Still, the failure rate remains high, especially for large IT projects. Our postmortem analysis of 15 large IT projects of the Swiss Federal Administration, with an accumulated loss of one billion U.S. dollars, shows that while project management deficits account for some of the failures, project failure is primarily caused by poor project governance capabilities. Based on insights gained from the initial failure analysis, the Swiss Federal Government decided to assess all its large IT projects based on our co-designed framework. Meanwhile, also private companies have assessed IT projects applying our framework. As a consequence, valuable discussions and measures have been initiated and sporadically projects were stopped. The data gained by these assessments will allow to identify patterns that promise to be a reference for governance actors and bodies what information to ask for, when to intervene, and how.

Keywords

Governance, IT Project, Management, Project Failure, Project Success

A.1 Introduction

Even after many decades of increasingly mature project management practice¹, 71% of IT projects fail completely or partially (TheStandishGroup, 2016). In particular, large governmental IT projects (more than 6 million U.S. dollars labor cost) are affected, where the share of complete or partial failure reaches 87% (T.S.Group, 2015). Public sector IT projects are six times more likely to overrun costs and twenty times more likely to overrun schedule than similar projects in the private sector (McKinsey, 2013). In light of the increasing number of IT projects in the context of digitization in both sectors, it is to be expected that failure costs of IT projects are going to increase even more.

Albeit years of broad attention to IT project success in both IT and project management academia and practice, there remain uncertainty, conflicts and a thirst for knowledge about project success and failure factors. One way towards increasing project success in the future is understanding project failures through retrospective analyses. Such analyses not only help to identify the mistakes made, but also prevent future missteps (Nelson, 2005).

For this reason, it came as no surprise as four years ago public pressure and disclosure urged the investigation of failed IT projects within the Swiss Federal Administration, which caused a loss amount of ca. one billion U.S. dollars. This need for an in-depth postmortem analysis has led to our opportunity to not only co-design an analysis framework, but also to apply it to 15 large, complex, failed IT projects within the Swiss Federal Offices.

The somewhat paradox situation of continuously maturing project management techniques and capabilities, accompanied by the prevailing project failures, triggered the expansion of our focus beyond project management, leading to our research question: *“Why do IT projects fail even if project management was carried out according to the state-of-the-art?”*.

A.2 Background

To underpin the elements of our analysis framework, we briefly summarize our understanding of both project success and project failure, and define project governance. These concepts are concerned with not only the conformity of project management with the interest of the owner and organization (Morris & Geraldi, 2011; Tirole, 2001), but

¹ There is a high number of professional project management education programs accompanied by a high demand for practitioners with project management certifications (PMI, 2013).

also with the performance of the project (management) within the organization (Crawford et al., 2008; Too & Weaver, 2014).

A.2.1 Understanding Project Success and Project Failure

For decades there has been an extensive discussion on how to define project success (and failure) and its causes. Many publications use the tripartite definition of success - *on time, within a set budget, and a requested functionality* – often referred to as the *iron triangle*. However, the concept of the iron triangle has been challenged (Doherty, Ashurst, & Peppard, 2012; Ika, 2009) and a broad agreement on how to define project success has not yet been reached. Baccarini (1999) split the concept of project success into a process and a product component. Process success is oriented at the iron triangle criteria where “[...] failure is seldom a result of chance. Instead it is rooted in one, or a series of misstep(s) by project managers” (Nelson, 2008, p. 70). Product success, on the other hand, measures the project outcome in terms of user satisfaction and / or realized user benefit. Hence, even if project management has been successful, the final outcome of the project may not fulfil essential stakeholder requirements. As a consequence, it is often suggested to add a benefit component to the concept of the iron triangle or even to shift the emphasis from process to product performance: Project goals should shift from successful deployment (i.e. doing solution development right) to benefit realization in use (i.e. developing the right solutions) (Doherty et al., 2012; Peppard & Ward, 2007). Considering the context (i.e. social, organizational, political, and technological environments or conditions) becomes essential to delivering a successful project. The context has been identified as critical not only for IT projects, but also for other types of projects (Conforto, Carpaldo Aramal, da Silva, di Felippo, & Kamikawachi, 2016; Lechler & Dvir, 2010; Shenhar, Tishler, Dvir, Lipovetsky, & Lechler, 2002; Wearne, 2014). In conclusion, we understand a successful project as not only being on time, within a set budget, and meeting requested functionality through a successful project management process, but also as creating an outcome / product that is being used within a given context. Therefore, we argue that the key to project success often lies beyond project management.

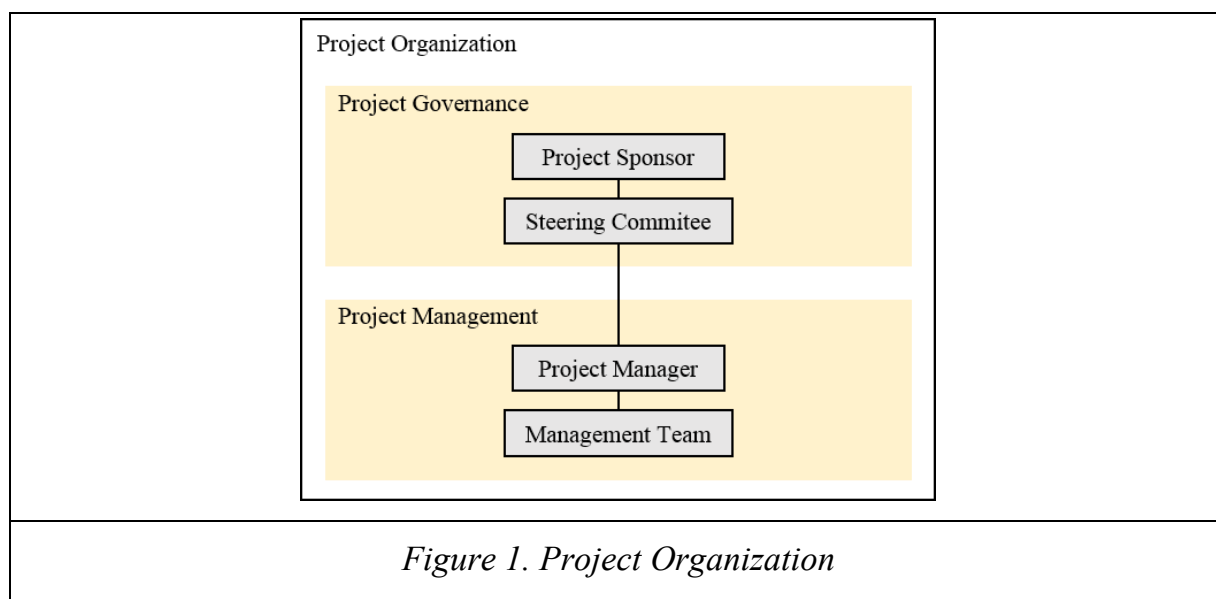
A.2.2 Doing Things Right vs. Doing the Right Things

Massive organizational investments, but also increasingly mature methods and certifications have led to a large and highly skilled workforce and pool of experts in the field of project management, which clearly helped to scale up the amount of successfully completed projects. Method support ranges from generic project management methods

to those that are specific to agile development (e.g., PRINCE2 Agile), to large IT projects (e.g., HERMES), or even very large infrastructure projects (e.g., S-O-S Method). What all of these project management methods have in common is their focus on doing things right. Project management is understood as “[...]the application of knowledge, skills, tools, and techniques to project activities to meet project requirements” (PMI, 2013, p. 15) by project managers. However, as mentioned before, project success does not solely lie in the hands of the project manager and her team, because projects are embedded not only in an organizational, but also in a specific context (e.g., organizational, technical, political). Hence, if certain conditions are given – no matter all efforts taken for bringing project management to perfection – projects are doomed to failure. The actions of project management depend on decisions made on the project governance level: doing the right thing lays the foundation for doing things right.

Project governance only recently started to gain increasing attention in academia and practice. It is concerned with the alignment of project objectives with the organizational context and strategy (PMI, 2013) and constitutes the framework for project decisions (Garland, 2009). Actors and bodies on the project governance level are the project sponsor and a steering committee (of which the project sponsor is a member) who set the framework and boundaries for project management (i.e. through definition of policies, processes and roles) and at the same time support project managers in managing the project successfully - i.e. meeting a project’s objective (Müller, 2011; Volden & Samset, 2017). Figure 1 shows project governance and management in hierarchical structure as it is understood in HERMES²:

² As HERMES is the reference project management method in our analysis. There are some details given here: HERMES is a project management method for IT projects, which has been expanded to guiding service and product development, and business adjustment projects. The method was developed by the Swiss Federal Administration and is available as an open standard. Besides the federal administration, which is obligated to use HERMES to manage its IT projects, many other public sector organizations and administrations, as well private sector companies have successfully work with HERMES. There are also HERMES educational courses and certifications. To find more information please go to: <https://www.isb.admin.ch/isb/en/home/themen/projektmanagement/hermes.html>



Linking the business organization's management and governance level with the project organization, project sponsors have a critical role regarding the performance of large, complex projects (Miller & Hobbs, 2005; Too & Weaver, 2014). The project sponsor and the steering committee represent the business organization with its strategy, vision and goals in the project, allocate resources, and first and foremost are responsible that the right things are done. Doing the right thing can also mean cancelling a project. For example, if there are changes in the business environment that have an influence on requirements and scope, cancelling even an on-track project that however sooner or later will be impacted, might actually be the best decision (Emam & Koru, 2008). Once started, complex projects – like most IT projects – are difficult to control and “the tendency to cover up and deny early indications of project troubles compounds the problems and delays their resolution” (Iacovou & Dexter, 2004, p. 69). In the worst case - when poor contextual conditions are denied - it is almost impossible to prevent a project from failing (Iacovou & Dexter, 2004).

An increasing yet small number of organizations and governmental institutions have introduced governance frameworks. Despite the relevance of project governance for project success, there is a lack of research on the roles and processes of project governance (Murphey, Lyytinen, & Somers, 2018). Furthermore, not many practical governance guidelines and methods exist for projects - and those are rarely applied or certified (Dinsmore & Rocha, 2012; Müller et al., 2016). Whereas in most organizations project managers have to bring along the required skills and corresponding certificates for managing a project, project sponsors or steering board members often just slip into their role

because of their (hierarchical) position in the organization or their management experience (Simard & Laberge, 2014). The high maturity of project management, together with the comparatively low maturity of project governance, constitute the backdrop for the failure analysis presented in the next section.

A.3 Failure Analysis through a Co-Designed Framework

Public pressure and disclosure has formed our opportunity to analyze 15 large, complex failed IT projects of the Swiss Federal Administration. The study was commissioned to answer the question why, despite the application of a state-of-the art project management method, these projects failed and created losses of together approximately one billion U.S. dollars in a period of less than 10 years – quite a significant amount for a country with only around 8 million inhabitants. As it should be a key objective of every postmortem analysis to investigate not only what went wrong and what went right, but also “[...] make recommendations that might help future project managers avoid ending up in a similar position” (Nelson, 2008, p. 70), we focused on discovering failure patterns to derive specific, employable measures to limit the damage of current, shaky projects and ensure the success of future endeavors. In line with Nelson’s (2005) emphasis on retrospectives as not being limited to the post-implementation phase of a project, another objective was to design an analysis instrument that is also applicable and useful for assessing ongoing projects, hoping that failures can be prevented, present practices improved or changed, and future losses avoided. Thus, our instrument was co-designed with public administration offices that have an interest in applying such an instrument not only for postmortem analysis, but also in ex ante evaluation or project controlling.

A.3.1 Studied Projects

The 15 studied projects are all large and complex governmental IT projects that have been declared as failed by the Federal Chief Information Officer (CIO) - not meeting budget, functionality and / or time targets, and / or not generating promised value to the stakeholders. The projects were conducted in different federal departments and therefore embedded in different environments.

Due to the gravity of failure and public relevance, some of the cases were subject to debate in the Swiss Parliament³ as well as to reports of federal Investigation Commissions and even entailed legal lawsuits. Thus, many of the cases have gained broad media

³ The Swiss Parliament consists of two chambers: Swiss National Council and in the Swiss Council of States.

and public attention. The encountered damage consisted not only of financial losses, but also non-monetary losses like discontentment and loss of confidence from the general public and the parliament towards federal offices' performance as every financial loss is squandered taxpayer's money after all. All projects had different backgrounds and settings due to their various origins and they all took quite different courses. However, they had in common that project management was based on HERMES, the project management method prescribed for all projects of this size. Some projects applied agile procedures, but only for software development purposes. The smallest project in our analysis caused costs of about one million U.S. dollars and the largest around 750 million U.S. dollars (average approx. 85 million U.S. dollars, median approx. 11 million U.S. dollars). In the following, four exemplary projects from our sample are characterized.

Project A

This project was initiated by the Swiss Federal Tax Administration 2001 with the aim to unify and replace the existing separately run financial services tax and general value added tax (VAT) information systems by a unified single system focusing on customer processes. Troubles in procurement and disputes between the administration office and the supplier culminated in a cancellation of the contract in 2006, followed by a disassembly of the original project into many smaller projects with different sponsors. In subsequent years the projects had gotten out of hand financially so that the entire project bundle was cancelled in 2012. Until that time more than 120 million U.S. dollars had been lost. One year later a follow-up project was launched.

Project B

In 2004 the Swiss Federal Roads Office launched an IT project to build a central data management system to enable administrative bodies from federal to municipal level to manage all road and traffic data more efficiently and effectively. Because of lacking transparency within procurement processes, the violation of the Federal Budget Act, and changing responsibilities of the Swiss Federal Street Administration due to the passing of a new legislation that changed the requirements during the project, costs more than double of the initially budgeted 46 million U.S. dollars had accumulated when the project was stopped.

Project C

The aim of this project was the development of an e-government, e-voting and tracking solution, designed for the special needs of a federal political system. The original budget at the project launch in 2003 was 1.3 million U.S. dollars per year over four years. In

the end costs ran up to 19 million U.S. dollars and were largely covered by the running budget of the accountable administration office. There were also preliminary investments of around 3 million U.S. dollars. Due to fundamental changes regarding e-government services, the main purpose of the project became widely redundant. However, the project was terminated only upon political interpellations.

Project D

This Project was initiated by the Federal Office of Information Technology, Systems and Telecommunication of the Federal Department of Finance and targeted at the introduction of an electronic standard workspace for all employees of the federal administration. The original budget was 85 million U.S. dollars over 5 years. After planned costs rose up to more than 225 million U.S. dollars the project was suspended. In the end, the project boasted effective costs of 177 million U.S. dollars and a duration of 6 years.

A.3.2 Co-Designing an Analysis Framework

The co-design of our analysis framework was an iterative process: Our first aim was to understand the 15 study projects. Thus, we started with the examination of the 15 projects through an analysis of project documents. We had access to unlimited and extensive documentation, such as project proposals, project plans, phase reports, controlling reports, documents expressing internal and external expertise, protocols of steering committee and project management meetings, project evaluations, and final reports. In order to further deepen our insights we conducted interviews with exponents of the largest projects under investigation. As we understood that due to the (still) ongoing debate, which is far from culminating into clearly defined concepts, we might not come to a to-the-point analysis framework by ourselves we started to work with focus groups⁴. We ran focus groups consisting of eleven highly experienced practitioners with several years of leadership and management experience in large, complex projects within the federal administration⁵.

The main outcomes of the co-design phase are an analysis model, two structured questionnaires, a project classification, and a set of failure patterns.

⁴ The use of focus groups is a suitable technique for “looking for the range of ideas [...] that people have about something”, for “trying to understand differences in perspectives”, for getting “ideas to emerge from the group” and for looking for information and opinion in order to design a research study (Krueger & Casey, 2014; Tremblay, Hevner, & Berndt, 2010).

⁵ Please see Appendix for more details about the co-designing of the analysis framework.

Our project analysis model consists of two dimensions: Project Method Compliance and Project Context Assessment (see Figure 2)⁶.

For each dimension we developed a structured questionnaire that covers 37 and 22 items, respectively⁷. The items are assessed using individual qualitative scales (0-5) - e.g. in terms of project goals the scale ranges from “no formally defined project goals (in written form) that are clear to the involved persons” (0) to “formally defined project goals (in written form) that are mutually derived as well as thoroughly understood and explicitly accepted by every involved person” (6). The single scores of the single items of both the project management compliance analysis and project context assessment are consolidated into an overall score for each management topic resp. context area and finally into an overall score for each studied project.

Dimension 1: Project Method Compliance

Our initial focus was on examining whether things had been done right. Thus, the goal was to assess the project method compliance of each project in accordance with HERMES project management method as a reference (see Table 4). The single items represent capabilities and activities within a project that can be influenced by the project organization. Each of the eight jointly defined topics consists of several items that are closely related.

⁶ Further explanations on the results in each dimension will follow in the next section (“Results of the Failure Analysis”)

⁷ The questionnaires (questions only) can be found here: <https://begsolutions.com/BQMBEG/Downloadwith-link.aspx?DocumentLinkID=280795a1-c1b3-466f-b22d-f33bd6181fa0>

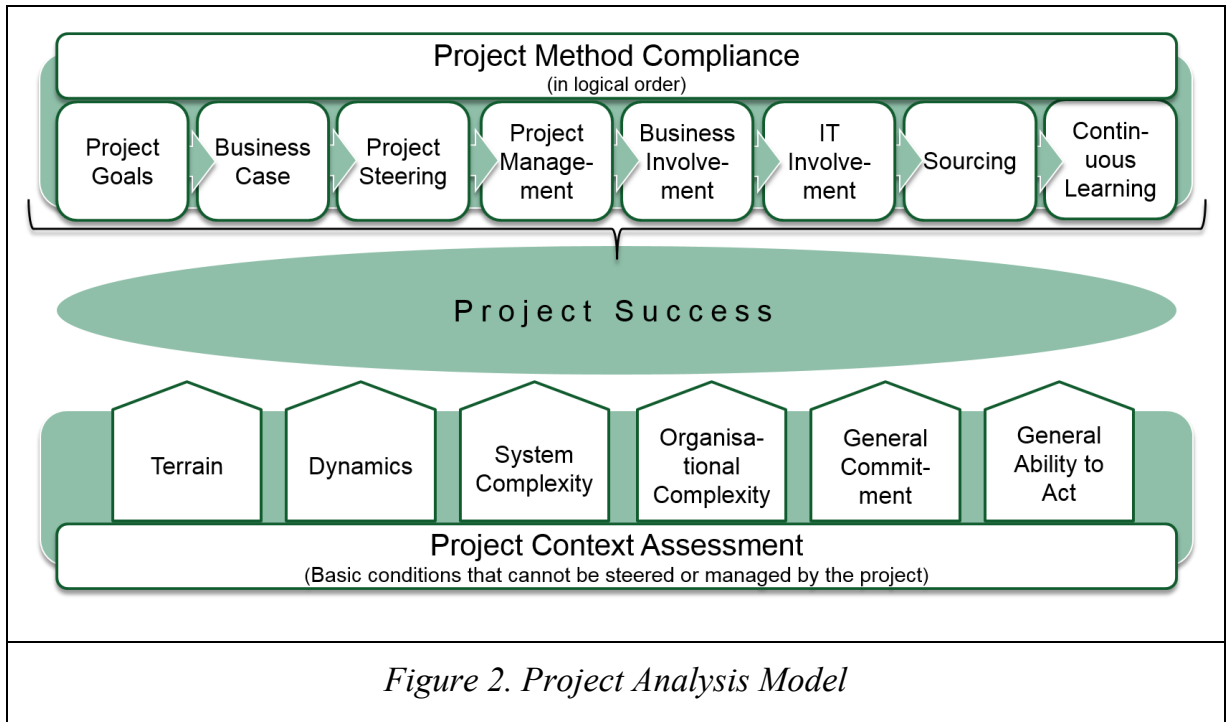


Table 5. Current Project Method Compliance

Topic	Items
Project Goals	Intention of sponsor; Goals per subproject, Management support for the project; Expectation management; Strategic conformity of the project
Business Case	Proven value (impact of the solution); Position of project in portfolio; Selection of project collaborators
Project Steering	Personnel composition; Responsibility and accountability (duties and rules); Monitoring and preventive measures; Approval of phase transition
Project Management	Project brief; Project planning and management; Change management; Risk handling; Resource Management; Solution implementation; Project controlling; Reserves
Business Involvement	Process management; Organizational change management; Funding; Investment controlling; Enterprise architecture; Data management
IT Involvement	Solution architecture; mastering technology; Availability of IT personnel; Operations and support
Sourcing	Fundamental decision making; Requirements management; Procurement processes
Continuous Learning	Experience transfer ex ante/post; Documentation of experience

Table 6. Current Project Context Assessment

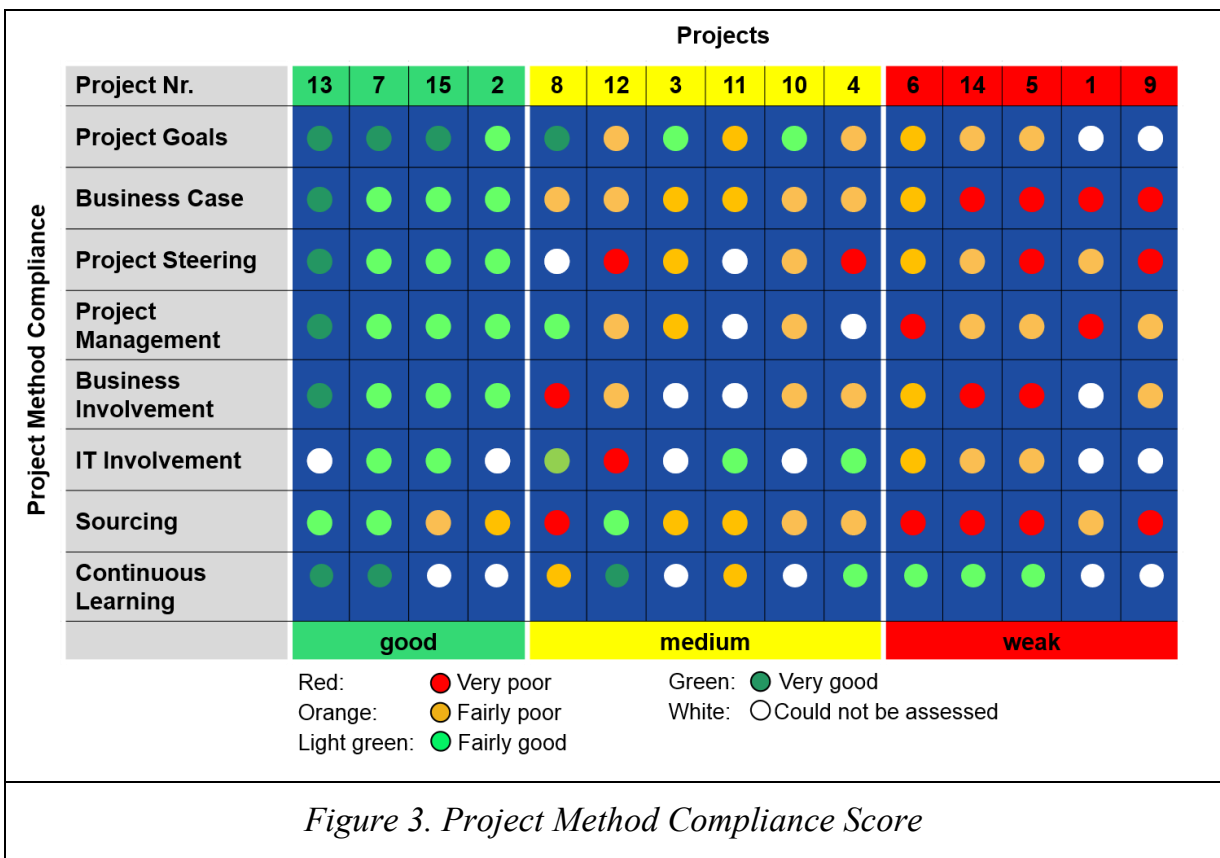
Area	Items
Terrain	Experience with similar projects and solutions; Experience with infrastructure, technology and management; Cultural terrain
Dynamics	Technological progress; Organizational changes; Openness to change; Requirements to be met by the solution; Political environment; Legal framework
System Complexity	Peripheral technical systems to be taken into account
Organizational Complexity	Heterogeneity of stakeholders; Complexity of organization
General Commitment	Managerial commitment or attitude towards collaboration of business organization and project organization; Coordination of budget and project situation
General Ability to Act	Decision-making autonomy within a project; assertiveness of project organization towards line organization; project capabilities in business organization

A.4 Results of Failure Analysis

During our analysis we found that some of the projects have obviously failed due to the lack of appropriate project management. However, we also found projects with professional and skilled project teams and state-of-the-art project management that nevertheless ran into massive difficulties and failed.

We created three groups of projects according to their project method compliance: good, medium and weak (see Figure 3 - respective sets of projects / columns are colored green, yellow, and red).

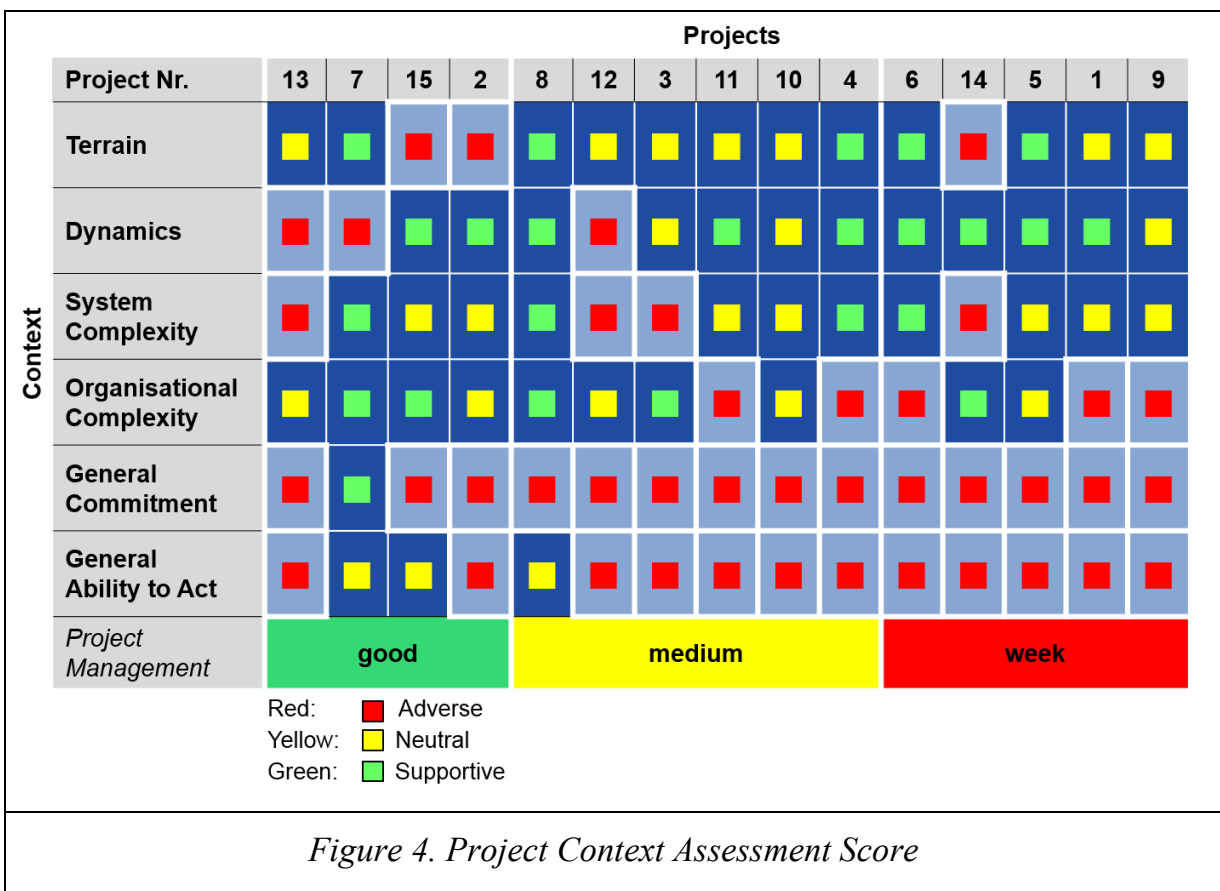
For projects P6, P14, P5, P1 and P9 a weak project management was the major cause for project failure, which comes without surprise. For projects P8, P12, P3, P11, P10 and P4 we assessed some aspects of project management to be appropriate. However, the score for the project method compliance was overall medium. Projects P13, P7, P15 and P2 were found having flawless project management, while still failing, which comes as a surprise.



Four out of fifteen analyzed projects scored well regarding project management compliance. The reason these projects nevertheless failed is to be found beyond the sphere of

influence and power of the project organization. Rather, the failure is caused by the project's context. Our project context assessment showed that almost all projects had difficulties in regards to general commitment and general ability to act (see Figure 4).

In many cases project managers and sometimes even other organizational actors were aware that the project was not progressing in a satisfactory way. However, they did not have the necessary means or power to get their concerns adequately addressed by their steering committees. In addition to that, in some cases the necessary support and / or understanding for the project in the business organization was inadequate.



The combination of project method compliance scores (dimension 1 of our analysis model) with project context assessment scores (dimension 2 of our analysis model) for each project allowed us to derive patterns that led to the following insights (see Figure 5):

Finding #1 (Cluster I): *Even good project management cannot save a mission impossible*

All projects that had good scores regarding the project management, but nevertheless failed, faced difficult (pre-)conditions in regard of terrain or dynamics. These difficult

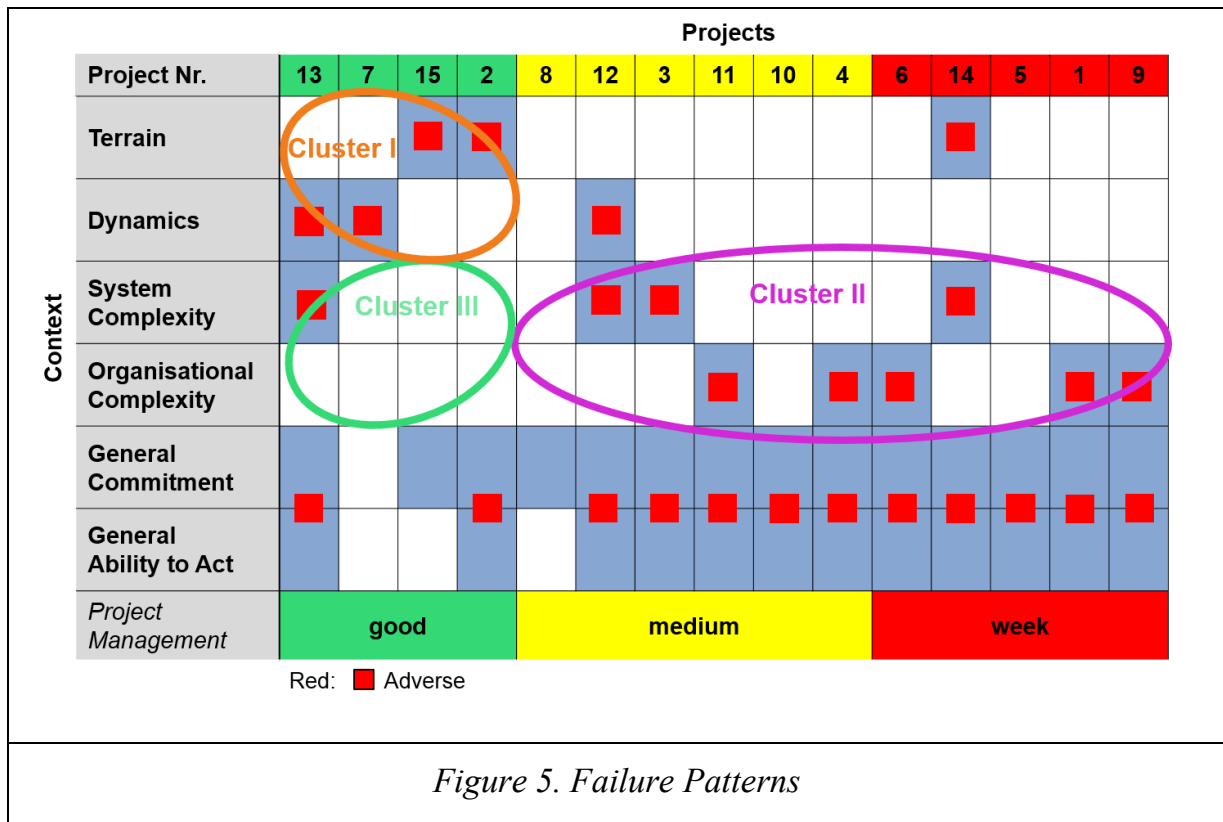
(pre-) conditions could obviously not be compensated by good project management alone (i.e. doing things right), particularly in combination with difficult conditions regarding general commitment and general ability to act.

Finding #2 (Cluster II): Even in known terrain accompanied by low dynamics, complexity endangers the mission if not countered by good project management

Projects that had a medium management score (i.e. had done most things right) or weak management score (i.e. were not adequately managed), even in known terrain and without dynamics challenges failed due to high organizational and / or technological complexity.

Finding #3 (Cluster III): In known terrain and low dynamics, complexity can be “healed” by good project management

Among the analyzed cases we did not find a single well-managed project that only failed due to difficulties regarding IT complexity and / or organizational complexity. Our third finding is therefore that complexity alone – as long as it is the only contextual challenge – can be compensated by proper project management especially in known terrain and low dynamics.



A.5 Proposed Countermeasures

The analysis phase yielded the conclusion that there is a need for actively taking care of a project's context. As a project's context is beyond the scope of project management, this is a governance task and leadership is necessary in order to under-stand terrain as well as dynamics and handle complexity so that project missions are defined in a way that gives project management a good chance to succeed. No matter how mature project management is, a project should not be started with a too high amount of tasks in new terrain and / or high dynamics.

Based on our detail analysis, we proposed fourteen measures. All measures were evaluated regarding their relevance and feasibility in a workshop. The 40 participants formally represented all federal departments and agencies. The proposed measures were also cross-verified through inter-views with exponents of four studied projects. Out of the fourteen proposed measures, twelve were rated as (very or fairly) relevant and (very or fair-ly) feasible and bundled into three measure packages (see Table 6).

Table 7. Proposed Measure Packages

Measure Package	Measures
Foundation Setting the foundation of a successful project organization for large, complex endeavors	Establishing and upgrading project management as a recognized discipline within the business organization; Establishing a professional project governance (i.e. in order that project sponsors and steering committees assume their responsibilities); Synchronizing budgeting and sourcing activities of project organization with business organization; Strengthening sourcing strategy and management
Triage Only launching large, complex projects within good context and with capable management	Implementing a “filter” within a preliminary phase (e.g. go or no go decision) before a project’s approval focusing on context and project management method; Establishing a more structured and rigorous pre-project phase; Ensuring consistent monitoring regarding context and management along all project phases
Ability Building the capabilities of successful, context-sensitive project management and governance	Building an organization wide project manager pool; Establishing communities of practice to exchange project governance and management experience; Employing internal and external experts and coaches to evaluate and support project managers, sponsors, and steering committee members; Emphasizing the building of effective requirements and change management capacities

These three measure packages are currently “translated” into respective extensions of the HERMES project management method or into supplementary material (like guidelines to steering committees) within the Swiss Federal Administration⁸.

The measure packages cannot only be integrated into HERMES or project structures and organizations that use this project management method, they can also be useful to organizations and projects with other plan-driven project methods to trigger discussions and improve their practice.

A.6 Contribution to Practice

Based on our initial study, the Swiss Federal Government decided that all ongoing large IT projects (> 5 million U.S. dollars) had to be assessed using our analysis model. In order to facilitate these ca. 100 assessments, we developed a web-based tool (KEY Tool⁹) and trained assessors. All assessments were done by the respective project teams and moderated by trained assessors. Our assessments are usually organized as workshops (up to 4 hours) attended by the project sponsor, the project manager as well as

⁸ Find more about the integration of the measure packages to HERMES (in German): <https://www.news.admin.ch/news/message/attachments/37501.pdf>

⁹ KEY stands for key factors for project success.

other relevant project participants (up to 8 people). Guided by the assessors, participants go through a maturity rating (incl. target/actual comparison) of about 59 items regarding project context and project method compliance and have to reach a consensus on each item.

A (small) number of projects were stopped as a consequence of the assessment. For other projects, valuable discussions and measures were triggered by the assessment.

In the meantime the KEY tool has also been deployed to assess large and complex running IT projects within the private sector. The assessment (workshop) has been recognized as a valuable method to find potentials for improvement within a project by all participants. We have been continuously evaluating and refining our tool. It can now be configured (i.e. individual selection of relevant questions, changing of wording of questions, etc.) to ensure an even better match with the project, the applied project method, and user benefit. The data gained by meanwhile close to 200¹⁰ assessments allows us to continue with the identification of patterns that promise to be a reference for steering committees and project sponsors about what information to ask for, when to intervene, and how to intervene. Furthermore, we are establishing a systematic monitoring of taken measures and their effect on the project's course. For practitioners, insights and patterns may be directly used to challenge actual business practices, including how steering committee members are prepared and supported in their organizations. Moreover, identifying patterns can leverage organizational learning regarding large, complex projects and thus contribute to future project success.

A.7 Conclusion

Despite the general lack of consensus about project success and failure causes we were able to co-design an analysis framework through which we initially assessed 15 large, complex IT projects (that have failed) regarding their project management capability (management components) and aspects “beyond project management” (i.e., contextual factors). In order to reduce a project's risk of failure, or rather, ensure its future success, its context has to be understood better, monitored more closely, and changed more effectively. These activities are located on the level of project governance, not of project

¹⁰ This figure comprises of the 15 initial assessments of failed projects within the Swiss Federal Administration, ca. 100 subsequent assessments of ongoing projects in the Swiss Federal Administration, and ca. 75 assessments of ongoing projects in the public and private sector.

management. Besides continuously fostering project management excellence, organizations therefore should focus on strengthening their project governance by developing and maintaining stable governance structures, effective processes and ensuring that roles are known and lived correctly. We suggest steering committees and project sponsors to deal with contextual factors (dimension 2 of our analysis model) as rigorously as they are used to deal with management components (dimension 1). Thus, steering committees should establish the analysis of project context as well as the systematic collection and re-use of decision making patterns as standard agenda items. Furthermore, structures and processes that allow an open dialogue between project management and steering level, need to be established to ensure an effective discourse on a project's continuously changing context. Our co-designed framework has allowed public and private organizations to analyze failed or running projects from a holistic perspective and to derive specific governance measures.

Paper B – Project Success Requires Context-Aware Governance

Table 8. Bibliographical Metadata Paper B

Title	Project Success Requires Context-Aware Governance
Authors	Kiselev, Caroline; Winter, Robert; Peter Rohner Institute of Information Management, University of St. Gallen St. Gallen, Switzerland
Selected approach for order of authors	Sequence determines credit
Publication outlet	MIS Quarterly Executive 19(3), 135-147.
Publication type	Journal Paper
Publication year	2020
Publication status	Published

Abstract

Despite growing project management maturity, the failure rate of IT-related projects remains high. We investigated four large IT-related projects within the Swiss Federal Administration that were well-managed but still failed. We found that these projects failed because of poor project governance, in particular inadequate handling of project context by the project sponsor and steering committee. We identify five contextual factors that steering committees should focus on and provide recommendations for strengthening context-aware project governance, illustrated by their implementation in the Swiss Federal Administration.¹¹

Keywords

Governance, IT Project, Project Context, Project Success

¹¹ Hope Koch is the accepting senior editor for this article.

B.1 IT Project Failure Rate Remains High

The emergence of new digital technologies has led to a considerable increase in IT investment and a rise in projects focused on modernizing IT systems and driving digitalization within organizations, a trend which is expected to continue in the coming years. Along with the growing number of IT-related projects and massive organizational investments, increasingly mature project management methods and certifications have created a highly skilled IT workforce and a large pool of experts in the field of IT project management. Although growing project management maturity has helped to increase the number of successfully completed projects up to 71% of IT projects still fail entirely or partially (TheStandishGroup, 2016). This paradoxical situation has been investigated by researchers in the field of IT project management with the aim of identifying project success factors that are separate to—or cannot be influenced by—good project management (Gu, Hoffman, Cao, & Schniederjans, 2014; Sirisomboonsuk, Gu, Cao, & Burns, 2018; Winter, Rohner, & Kiselev, 2019).

Our investigation of 15 large IT-related project failures revealed that a project's context (e.g., organizational, technological and political environment), and especially the inability to handle a project effectively at the governance level, are crucial elements of failed projects (Winter et al., 2019).

We, therefore, decided to focus our retrospective investigation of large failed projects on the contextual issues of projects that used state-of-the-art project management methods. Based on four in-depth case studies, we identify common challenges at the project governance level and provide recommendations for implementing context-aware project governance.

Although a focus on failure has negative connotations, failures are a valuable source of learning—especially when the broad focus on success in the project management literature has not yet given rise to a systematic and coherent understanding of why IT projects fail. Retrospective investigations of failed projects (also known as postmortem analyses) not only help to identify and catalog past mistakes but, more importantly, can help prevent others from making the same mistakes (Nelson, 2005, 2008).

In this article, we first investigate the paradox of projects failing despite the use of state-of-the-art project management methods. These failures are due to project governance not taking proper account of adverse contextual factors. Next, we highlight the pivotal role of project governance in large IT-related projects. We then describe our approach to the postmortem analyses of four large failed IT-related projects, summarize the results

of these case studies and identify five contextual factors that were not properly considered at the project governance level and that contributed to project failure. Finally, we provide recommendations that will help executives strengthen project governance, mitigate contextual threats and create (or maintain) conditions under which IT projects can succeed.

B.2 The Project Management Paradox

For decades, IT practitioners and researchers have focused on defining project success, understanding project failure and identifying the respective causes of success or failure. Much of the project management literature uses the tripartite definition of success—on time, on budget and with the requested functionality. This definition, which is often referred to as the iron triangle, focuses on the project management process, and efforts to enhance project performance have primarily been aimed at improving this process (Besner & Hobbs, 2012). Indeed, the persistent high investment in building up a professional project management workforce (PMI, 2013) suggests that a project's success or failure is linked mainly to project management capabilities.

However, the iron triangle has been challenged and extended (Baccarini, 1999; Doherty et al., 2012; Ika, 2009; Nelson, 2008), with the concept of project success being enhanced to include a combination of project management process criteria and product criteria. The product criteria are the project *outcomes* in terms of user satisfaction and/or realized benefits. For example, a project is not considered successful if appropriate results are delivered but the intended benefits are not realized. Thus, project management experts have suggested that project goals should shift from successful deployment of a solution (i.e., doing the right development) to the realization of benefits (i.e., developing the right solutions for a given context) (Peppard & Ward, 2007). The research findings reported in this article are based on this extended understanding of project success—i.e., a combination of both project management process criteria and product-related criteria. As project failure rates have not significantly decreased, our hypothesis is that certain other critical success factors beyond project management (Nelson, 2008) have not been sufficiently considered.

We refer to this phenomenon as the project management paradox: under certain conditions, no matter how sophisticated the management of a project is, projects are doomed to fail. Our initial analysis of 15 large failed IT-related projects within the Swiss Federal Administration provided insights into this paradox (Winter et al., 2019). We observed

poorly managed projects that had failed, which came as no surprise. Surprisingly, however, some projects had been well managed but still failed, which is clearly counterintuitive to the wisdom from common practice. According to our analysis, these projects failed because of adverse contextual conditions, which were beyond the control of project managers but should have been detected—and addressed—by the projects’ sponsors and steering committees.

B.3 The Pivotal Role of Project Governance

It is important to distinguish between project management and project governance. Project management is project managers’ “*application of knowledge, skills, tools, and techniques to project activities to meet project requirements,*” (PMI, 2013, p. 15) whereas project governance ensures the alignment of an IT-related project’s goals and outcomes with organizational strategies (e.g., IT strategy, business strategy and digitalization strategy). The difference between project management and project governance can be roughly characterized as “doing things right” (project management) vs. “doing the right things” (project governance) (Winter et al., 2019).

A project’s *context* comprises the social, organizational, political and technological conditions that are relevant to project success, but cannot be directly influenced by project management. Status and power, opportunities, and actors and bodies at the project governance level may influence the context to some extent and therefore create and maintain favorable conditions for project management.

There are multiple views of project governance in academia and practice, ranging from a systemic or holistic understanding to a role- or task-oriented one. The systemic or holistic understanding is derived from corporate governance and perceives project governance as a system consisting of organization-level policies, processes, instruments and roles for controlling and monitoring projects (Ahola et al., 2014). The role- or task-oriented understanding sees project governance as a complex system of tasks, competencies and responsibilities of certain actors and bodies aimed at controlling, managing and monitoring projects.

In this article, we draw on the narrower role- or task-oriented understanding of project governance. Typical actors and bodies at the project governance level are the project sponsor and the steering committee. The project sponsor and steering committee represent the business organization and its strategy, vision and goals. These actors and bodies initiate, monitor, steer and close the project. The lifecycles of these activities are significantly longer than that of project management. They start with creating common ground

between stakeholders regarding the intention of the project, as well as defining business benefits and usable resources. They finish by making sure that project outcomes create the intended business benefits. In terms of project hierarchy, project sponsors and steering committees are at the highest level, above project managers and their teams. In turn, project management is above project execution, with projects typically being executed through subprojects led by subproject managers.

Along with project managers, project sponsors and steering committees have a critical impact on the performance of large projects. In fact, the ways in which project sponsors and steering committees fulfill their roles can be the most important project success factor (Miller & Hobbs, 2005). The key contextual tasks and responsibilities of project governance are performed at this level (Miller & Hobbs, 2005; Müller, 2011). These include observing and analyzing a project's contextual conditions, "translating" the context into a feasible project mission, ensuring the alignment of a project with its (most likely changing) context during the entire project lifecycle and supporting project managers in "doing things right." Nevertheless, project governance tasks and responsibilities are less well understood than project management, and governance practices are less mature. For example, there are few practical governance guidelines for projects¹², and these are rarely taught in courses or are subject to certification.

In most organizations, project managers need to have certain skills and possess corresponding certifications to manage a project. Project sponsors and steering committee members, however, often assume their roles because of their positions in the organization hierarchy or their management experience (Englund & Bucero, 2006). Unlike project management, systematic organizational investment in building and assuring governance capabilities is almost nonexistent

B.4 Four Cases Illustrating Context Related Failures of Well-Managed Projects

Several years ago, public pressure and disclosure requirements created an opportunity for us to analyze 15 large failed IT-related projects undertaken by the Swiss Federal Administration. The purpose of our study was to determine why, despite the application of a state-of-the-art project management method, these projects failed and resulted in

¹² One exception is the Tasmanian Government Project management Guidelines, which include a governance framework.

losses of more than \$1 billion within less than 10 years, a significant amount in a country with a population of around eight million (Winter et al., 2019).

Because of the extent of each project's failure and its effect on the general public, some of the cases were debated in the Swiss Parliament¹³, formally investigated by the Federal Investigation Commissions and were the subject of lawsuits (e.g., legal claims from suppliers). The predominant opinion among the public and the federal offices was that project management shortcomings had caused the projects to fail. According to our analysis, however, putting the blame on project management alone is not warranted. Although we found that six projects failed because of minor project management faults and five failed because of severe faults, four projects failed despite no significant project management faults being identified. These four projects were all large governmental IT-related projects that the federal chief information officer declared as having failed even though they were well-managed according to the government's standard project method.¹⁴

Below, we describe our analysis of these four "well managed but failed" projects, highlighting the adverse contextual factors—and the inadequate handling of these factors at the project governance level—that led to the failures. From this analysis, we have identified five contextual factors that, if not handled adequately by steering committees¹⁵, can result in project failure.

The four projects, which we refer to anonymously as "Office Automation," "Command and Control," "Tax" and "Business Administration," were conducted in different federal departments and, thus, were embedded in different environments. Table 8 summarizes the characteristics of these failed but well-managed projects.

¹³ The Swiss Parliament consists of two chambers: the Swiss National Council and the Swiss Council of States.

¹⁴ The project standard of the Swiss Federal Administration is called HERMES, which is mandatory for all large IT-related projects in public administration in Switzerland and is also used in many private companies in and outside Switzerland. HERMES' method support includes process models, specifications of activities, roles and deliverables, and templates for documents, covering all project phases from initiation and concept to implementation and deployment. As a public service, all HERMES specifications are available in four languages at <http://www.hermes.admin.ch/onlinepublikation/index.xhtml>.

¹⁵ Typically, the project sponsor is the chair of the steering committee.

Table 9. Characteristics of the Four Failed but Well-Managed Projects

Project	Organization	Topic	Duration	Cost (\$ millions)
Office Automation	Federal IT Steering Unit	Workplace standardization	6 years	380
Command and Control	Department of Defense, Civil Protection and Sport	Renew command-and-control system	6 years	750
Tax	Federal Tax Administration	Unified tax information system	11 years	120
Business Administration	Department of Foreign Affairs	Integrated business administration system	2 years	12

B.4.1 Assessing How Committees Influence the Five Contextual Factors

From a literature review and focus groups on potentially relevant contextual impacts, we identified five contextual factors—1) Terrain, 2) Dynamics, 3) Complexity, 4) Commitment and 5) Ability to Act (Winter et al., 2019). By definition, a project’s context is external and, thus, cannot be influenced by project management. The contextual factors can, however, be at least partially influenced by steering committee members. To discover the context of each of the four projects and how that context was handled from a project governance perspective, we used a questionnaire based on the five contextual factors and their subfactors. Table 9 summarizes the questions we used to discover how the steering committees for the four projects influenced the contextual factors. The questions were designed to assess the project governance and steering committee’s behavior in relation to each subfactor.

In a subsequent step, we documented the project-related issues that arose in relation to each contextual subfactor. If issues occurred, we analyzed whether and in what way the contextual subfactors were adequately or not adequately addressed by the steering committee and what effect this had on project management and the project as a whole.

B.4.2 Overview of How Contextual Factors Were Dealt With

The assessment revealed that contextual factors were inadequately dealt with in all four projects. The extent of contextual challenges ranged from moderate (“Command and Control” project) to severe (“Office Automation” project). Even state-of-the-art project management was unable to compensate for the inadequate or lack of handling of these

contextual challenges at the project governance level. Table 10 summarizes the aggregate results from assessing how contextual challenges were handled in the four cases.

Below, we describe the issues triggered by the inappropriate handling at the project governance level of challenges arising from each of the five contextual factors—and the difficulties these issues created for project management as a consequence. For the “Terrain,” “Dynamics” and “Complexity” contextual factors we selected the most interesting of the four cases to illustrate challenges in the subfactors. For the “Commitment” and “Ability to Act” contextual factors and their corresponding subfactors, we present examples from three different cases.

Contextual Factor 1: Dealing With Unknown Terrain

The “Tax” project was initiated in 2001 by the Federal Tax Administration with the aim of replacing the separately run financial services tax and general value-added tax (VAT) information systems with a single unified system organized according to customer processes. After several reorganizations, the project was canceled in 2012, resulting in a loss of more than \$120 million. Interestingly (or rather unfortunately for the project), the steering committee remained unchanged during this period, while several staff changes were made in the project management team. As a consequence, deficiencies in analyzing project context and taking appropriate actions were not uncovered during this extended period.

The key problem was that the steering committee and project sponsor had an overly optimistic attitude not only regarding organizational and technological capability but also the organization’s readiness to undergo a transformation of this magnitude and scope. The committee and sponsor had clearly underestimated the organizational impact and the concerns of affected employees about future business processes and workplace operations, as well as long-term job security. As a consequence, project management experienced enormous resistance and adverse behavior both from the broad majority of employees and the project team. Intermediate solutions were not widely adopted by the organization and local workarounds were developed outside of the transformation project. Over the course of the project, several employees and project team members warned us that the organization was most likely not ready for such a transformation. However, because of the persistent focus among the workforce on running the business efficiently rather than effectively changing the business, the steering committee stuck to the original project mission and did not adapt the project’s scope or vision.

Table 10. Assessing Steering Committees' Handling of Contextual Factors

Description of Contextual Factor And List of Sub-factors	Questions to Assess Project Governance Behavior in Relation to Each Sub-factor
Terrain Contextual Factor Terrain refers to the technological and conceptual territory an organization enters through a project. Sub-factors: - Experience with similar project or solution - Existence of standard solution in use - Sufficiency of existing infrastructure - Experience with similar organizational changes	Did the steering committee a) ask itself if: - The organization had ever conducted a similar project or implemented a similar solution? - There existed a standard solution that is already in use in a similar organization? - The existing infrastructure was sufficient? - The organization had experience of the extent of expected organizational changes? and b) did the committee do anything as a result?
Dynamics Contextual Factor Dynamics refers to the speed and ambiguity of technological, organizational, political and legal environments, and user demands (each representing a sub-factor).	Did the steering committee a) ask itself if: - Rapid technological progress could be expected? - There were changing organizational conditions? - There was a changing political environment? - There was a changing legal environment? - There could be changing user demands? and b) did the committee do anything as a result?
Complexity Contextual Factor Complexity refers to both system and organizational complexity. Sub-factors: - Number of relevant peripheral technical systems and interfaces - Complexity of system architecture - Stakeholder heterogeneity - Complexity of organizational structures and processes	Did the steering committee a) ask itself if: - There were many peripheral technical systems to be taken into account? - The system landscape was complex? - The project's stakeholders were highly heterogeneous? - The organizational structures and processes were complex? and b) did the committee do anything as a result?
Commitment Contextual Factor Commitment refers to the general standing and respect of projects within an organization. Sub-factors: - Management commitment - Employee commitment	Did the steering committee a) ask itself if: - Management's commitment to and attitude toward collaboration between the business organization and project organization was positive? - Employees' commitment to and attitude toward working within a project was positive? and b) did the committee do anything as a result?
Ability to Act Contextual Factor Ability to Act refers to the autonomy and independent progression of a project. Sub-factors: - Decision-making authority - Budgeting cycles	Did the steering committee a) ask itself if: - There was appropriate decision-making authority in the project? - Budgeting cycles were aligned with the project's lifecycle? - Sourcing cycles were aligned with the project's lifecycle? and b) did the committee do anything as a result?

Another challenge was the internal knowledge gap: the organization lacked change management experience. Although this gap could have been filled at least partially through external support, the steering committee did not explore that option because it believed the organization would be able to learn and gain the required knowledge and additional spending on external resources was therefore not needed.

Finally, the existing IT infrastructure was not sufficient for the intended solution and the need to upgrade the infrastructure was not considered by the steering committee. For instance, the size of the on-premise application and communication server farms could not satisfy application requirements, which dramatically increased over the course of the project. As a consequence, response times became lengthy and unpredictable. A growing awareness of being part of a “mission impossible” led to increasing frustration among the entire project team—and the project manager could not do anything about it.

Contextual Factor 2: Dealing with a Highly Dynamic Environment

The “Command and Control” project was conducted within the Federal Department of Defense, Civil Protection and Sport, and, with a budget of approximately \$750 million, was the most expensive of all of the projects we studied. The project was launched in 2006 and shut down six years later. The aim of this project was to modernize the entire command-and-control system by optimizing existing hardware and software as well as integrating new solutions. Because of the massive investment required, setting up a well-functioning project management was a major priority and was achieved. Nevertheless, the project failed to generate the intended benefits. This failure can be attributed mainly to the highly dynamic context within which the project was operating, and the project manager had no control over that context. Rapidly evolving communication technologies, accompanied by rapidly changing user demands, made it impossible for the strongly plan-driven project to keep pace. During the course of the project, it became apparent that most of the use cases involved mobile technologies but the needed infrastructure was not available. Nevertheless, the project team tried hard to find ways to make the solution work with low-band width/high-latency networks, but their efforts were doomed to ultimately fail—despite massive investments of time and energy.

The steering committee ignored the risks from technological advances and changes in user requirements that would disrupt the intended outputs of the project. Instead, they adhered to the original project mission with strictly defined functionalities throughout the project’s duration. This lack of agility in terms of deliverables meant that many of the deliverables were not sufficiently compatible with mobile communications and were

therefore useless. Project governance was focused on “the wrong thing,” while project management “did things right”, according to the project plan.

Additionally, the political environment was not supportive. At its launch, the project was highly controversial and passed a parliamentary vote by only a tight margin. The project suffered from waning political support in parliament as well as from changes in the leadership of the federal department, which caused considerable uncertainty and several project stoppages. The steering committee did not pay attention to these two sub-factors and left the project team to deal with these issues. The project team, however, was unable to handle challenges of this magnitude due to its lack of assertiveness and power.

Contextual Factor 3: Dealing with Technology and Organizational Complexity

The “Office Automation” project was assigned to the Federal IT Steering Unit, a unit within the Federal Department of Finance. The project’s goal was to harmonize various technical and organizational areas of office automation throughout the entire federal administration, thereby introducing a standard workplace for the entire federal workforce. Part of the project was the gradual replacement of voice communication (landline and mobile) by a new standardized office automation service called Unified Communication & Collaboration (UCC). The project started in 2007 with a targeted duration of four years and a budget of \$300 million. In the end, however, the project evolved into a duration of six years and a cost of \$380 million. Although the project mission was clear and, according to the project manager, was “*in principle easy to understand*,” the intended benefits could not be fully achieved. The overly complex context meant that the planned cost reductions, integration of heterogeneous functionalities and production environments, improved interoperability and the introduction of entirely new functionalities (e.g., telephone integration) could not be accomplished.

There were two complexity issues. First, there was a high amount of technical complexity. Many peripheral technical systems and interfaces had to be taken into account, forcing project management to deal with a system architecture complexity that had been underestimated by the project sponsor and steering committee. Project management was not allowed to make changes to existing system components and was forced to introduce a standardized solution mandated at the project governance level. Second, because the entire Swiss Federal Administration would have to adopt a standard workstation, there was a high level of heterogeneity among the stakeholders’ requirements and expectations, which led to tensions between the project’s management and its stakeholders. The

steering committee ignored the complexity of organizational structures and processes as well as the immense number of different stakeholders affected by the “one-size-fits-all” solution.

Overall, the technical and organizational complexities were never acknowledged as a risk to the project by the steering committee, which never considered the possibility of dividing the project into several smaller, more manageable projects. The project manager was left with a huge manageability challenge and concerns raised by the project manager were never taken seriously by the steering committee.

Contextual Factor 4: Dealing with a Lack of Commitment

Two of the four projects struggled with a “project-adverse” line organization—i.e., a general lack of commitment to large projects, which fostered a lack of respect for project management among both the majority of employees and management. In the “Tax” project, for instance, the line organization’s managers were most concerned about ensuring stable operations of existing information systems and therefore saw the introduction of a single unified system as a major disturbance and a threat to performance. Hence, management commitment to the project was lacking. Although the steering committee included representatives of the line organization’s management, it was not able to overcome concerns about a unified system and find a balance between stability requirements and change efforts. As a consequence, there was a lack of collaboration between the line and project organization, which negatively impacted project work in terms of obtaining the needed support and cooperation of employees.

In the “Office Automation” project, the lack of commitment can be attributed to the fact that the project affected the workforces of eight parent organizations (i.e., seven federal departments and the Federal Chancellery), but none of them “owned” the project. The steering committee neither prevented nor contained the lack of management commitment. A possible reason for this is that not every parent organization was represented within the steering committee. This meant that not every affected organization’s top management felt they played an active role in steering the project—and therefore were not necessarily committed to the introduction of a standard workplace for their employees.

In both projects, project management did not receive the necessary respect and acceptance to successfully proceed because the projects were seen as troublesome and disturbing to daily operations, rather than as an opportunity to improve the core businesses and collaboration between different departments. This gave rise to continuous

scrutiny of many project management activities and forced project managers to invest a large amount of effort into convincing the organization's management that the project was on track, which was hard to do given the insufficient support from steering committee members.

Furthermore, especially in the "Tax" project, many internal employees were neither used to nor trained to do project work and were uncomfortable working in this way, which left project management with a team consisting of poorly motivated and poorly skilled members. The steering committee did not consider the "project-adverse" attitude and lack of project training of internal employees and therefore did not see any need for action.

Contextual Factor 5: Dealing with an Inability to Act

Three of the four projects faced challenges relating to the ability to act contextual factor. For example, severe problems with the software supplier emerged during the implementation phase of the "Business Administration" project. (This project was launched in 2012 by the Federal Department of Foreign Affairs to replace an old document management system with a modern, more user-friendly solution at the cost of \$12 million.) The supplier did not provide the promised staff in terms of quantity and professional experience, which prevented the project from proceeding. Although the project manager and even the steering committee members were aware that the project was not proceeding due to supplier problems, they were not empowered to act. They could not take further measures beyond exerting pressure on the supplier to remedy the situation—which, in the end, led nowhere because they lacked decision-making authority.

The "Tax" project also experienced supplier issues, which left the project stuck at several points over its lifecycle. In this case, the problem was not caused by the poor performance of the supplier but by the organization's lengthy sourcing cycle, which did not mesh with the project plan and led to delays of several months. Furthermore, in the "Office Automation" and "Tax" projects, the misalignment of the organizational budgeting cycle and the project lifecycle had been ignored at the project governance level. On several occasions, this led to missing approval of resources and forced project managers to deal with financial and human resources shortages. In both cases, the projects' steering committees did not address issues impeding the projects teams' abilities to act, as the committees' members did not have a feasible strategy or suitable means to overrule the organizations' power structures.

Table 11. Overall Assessment of How the Contextual Challenges Were Dealt With in the Four Cases

		Project «Office Automation»	Project «Command & Control»	Project «Tax»	Project «Business Adminis- tration»
Terrain	Experience with similar project /solution				
	Existence of standard solution in use				
	Sufficiency of existing infrastructure				
	Experience with similar org. changes				
Dynamics	Technological changes				
	Organizational changes				
	Political changes				
	Legal changes				
	User demands				
Complexity	Amount of peripheral technical systems and interfaces				
	Complexity of system architecture				
	Stakeholder heterogeneity				
	Complexity of organizational structures and processes				
Commitment	Management Commitment				
	Employee Commitment				
Ability to Act	Decision-making autonomy				
	Budgeting Cycles				

■ Inadequately addressed
 ■ No problems found
 ■ n.a.

B.4.3 Case Analysis Summary

Our analysis of the four “well-managed but failed” projects provides some counter-evidence to the prevailing understanding of project success. Although our findings should not discourage organizations from building project management capability, they underline that *appropriate project management is a necessary but not always a sufficient condition for project success*. In each of the four cases, project governance bodies created and stuck with a project mission that was impossible for project management to accomplish—sometimes right from the beginning of the project and sometimes as a consequence of contextual changes that were either overlooked or not adequately handled by project governance. These four cases can help executives understand the contextual challenges a project faces and shortcomings at the project governance level when dealing with those challenges.

B.4.4 Non-Contextual Project Governance Issues

In addition to challenges resulting from inadequate consideration of the five contextual factors, we also identified some project governance issues that were independent of specific contextual factors. In all four cases, project sponsors and steering committees had problems in carrying out their roles properly. For instance, in the “Command and Control” project, steering committee members had been appointed based on their hierarchical position in the line organization. Although this clearly helped to ensure the assertiveness of steering committee actions, it neglected the need to have sufficient project steering and technological know-how in the committee—an important factor for such a complex endeavor. In contrast, steering committee members in the “Office Automation” project were appointed based on clear criteria for their project steering experience, technical know-how and change management capabilities.

Another issue independent of the five contextual factors was a poor relationship between the project management and project governance levels. Contextual challenges (e.g., in the “Tax” project) could have been detected and addressed much earlier and more effectively if:

1. Project management and steering committees had met more often and engaged in critical discussions rather than exchanging reports and spreadsheets.
2. Steering committees had represented stakeholders more adequately.
3. Meeting agendas had forced project management and steering committees to analyze and discuss context and contextual changes more systematically during the project.

B.5 Recommendations for Strengthening Context-aware Project Governance

Based on our analysis of the four “well-managed but failed” projects, we provide 11 recommendations, grouped under the headings of “Foundation,” “Triage,” “Ability” and “Collaboration.” These recommendations were derived in collaboration with the Swiss Federal Administration and from the actions taken by the Federal IT Steering Unit. Moderated by the Federal IT Steering Unit, the proposed recommendations were presented and discussed with 40 representatives of all federal departments and federal institutions, and have been integrated into the Federal Administration’s HERMES project method.¹⁶

¹⁶ More about the integration of the measures into HERMES is available (in German) at <https://www.news.admin.ch/news/mes-sage/attachments/37501.pdf>.

We explain how each recommendation has been implemented at the Federal Administration.

Although the recommendations were originally developed for large public organizations, our discussions with large companies, and projects in such companies, have shown they are equally applicable outside the public sector.

B.5.1 Foundation Recommendations: Strengthen the Organization's Project Capabilities

To address common problems relating to the line organization's lack of commitment to a project and project management's inability to deal with adverse contextual conditions, we provide three recommendations for setting a firm foundation for large IT-related projects.

Establish and Upgrade Projects and their Management as Recognized Functions in the Line Organization. The Federal IT Steering Unit's project management office launched a communications campaign designed to change the perception of the project from an interference to a strategic necessity for organizational success in the digital era. As part of this campaign, the office appointed influential executives as ambassadors of the project. Additionally, project management was upgraded to a recognized discipline within the Swiss Federal Administration, and an organization-wide project manager pool was set up.

Foster the Assertiveness of Steering Committees and Project Sponsors. The Swiss Federal Administration established clear rules for decision-making at the project governance level. For instance, steering committees now include at least one representative of each affected business and IT unit, with decision-making power and influence lying within the line organization.

Pay Attention to the Line Organization's Budgeting Cycles and Procurement Procedures. In the projects we analyzed, not only did the line organization's budgeting cycle (e.g., one fiscal year) need to be considered in a project's financials and schedules, but also complex procedures dictated by public procurement law. The HERMES standard has been amended to include approval of the plan components as a defined responsibility of the steering committee at the end of the initiation phase. These approvals take account of the budgeting cycles and procurement procedures.

B.5.2 Triage Recommendations: Prevent a Mission Impossible

Because even excellent project management cannot save a project situated within an adverse context, we provide three recommendations for triaging projects with the aim of preventing a mission impossible.

Only Start or Continue a Project if Context-Related Risks Are Known and Manageable. A rule was added to HERMES that forces steering committees to assess a project's context in the initiation phase so that they can make informed “go/no-go” decisions. Moreover, steering committees now need to define criteria for subsequent phase approvals, taking account not only of the deliverables and other project management-related factors but also the five contextual factors. As a part of a project's risk assessment, at least one assessment is now required by an internal or external expert who is independent of project management. The questions listed in Table 2 are used as the basis for assessing the context.

Prevent Over-Optimism at the Project Governance Level. The Federal IT Steering Unit has now established a strong but nonbinding recommendation (and reference guideline) to assign independent, neutral (active or retired) senior managers as “sparring partners” to the project sponsor and steering committee of a large IT-related project. The role of these independent managers is to prevent overoptimism at the project governance level.

Minimize the Technological and Organizational Complexity of Projects. This recommendation encourages the implementation of smaller projects instead of bundling as many deliverables as possible into one massive and unwieldy project covering all technological and organizational areas. Executives of the federal offices are encouraged by the Federal IT Steering Unit to modularize big endeavors so that the resulting projects can be handled in a more agile way. Modularization allows project management to address both technological and organizational complexity by reducing interdependencies and avoiding being “left in the dark” for too long. This recommendation was formalized by amending the HERMES project standard to include a hybrid method for guiding projects comprising traditional as well as agile elements.

B.5.3 Ability Recommendations: Establish and Improve Project Governance Skills

These three recommendations address the general lack of capability or ignorance at the project governance level to handle contextual factors properly.

Define and Communicate Tasks, Competences and Responsibilities for Project Sponsors and Steering Committees. The Federal IT Steering Unit introduced a short manual that guides project sponsors and steering committees in defining their tasks, competencies and responsibilities during a project lifecycle. As well as specifying project governance roles, the manual guides steering committee meetings through standard agenda items and defines compulsory project checkpoints. It is kept as short as possible as executives in charge demanded straightforward guidance. The majority of steering committees and project sponsors of projects within the Federal IT Steering Unit now work in accordance with this manual.

Provide Professional Development for Executives Who Are (or Will Be) Performing Project Governance Roles. The Federal IT Steering Unit was convinced that “classic” professional development provided via training or courses was not suitable for the target group. Instead, it addresses the need for the professional development of executives in a project governance function through a community of practice within the Swiss Federal Administration established for that purpose. The Federal IT Steering Unit also encourages active participation in a community of practice that brings together executives from various organizations to discuss project governance issues with steering committee members, project managers and project portfolio managers from other projects or programs.

Establish Independent Project Governance Quality Control. The Federal IT Steering Unit has extended its standard project auditing procedure (which is focused at the project management level and is conducted by the Swiss Federal Audit Office for the attention of the Federal Council) to include a review of each project’s governance performance. Every IT-related project within the Swiss Federal Administration that is defined as an “ICT key project” is subject to such an audit.¹⁷ The audit provides “praise and blame” for project sponsors and steering committees, and makes suggestions for improvement. Audit findings and suggestions are reinforced by the external sparring partners who not only help to prevent overoptimism and foster good faith, but also act as coaches to improve project governance skills and the context awareness of project sponsors and steering committees.

¹⁷ More information about the audit procedure is available at https://www.isb.admin.ch/isb/en/home/themen/programme_projekte/ikt-schluesselprojekte.html

B.5.4 Collaboration Recommendations: Ensure Effective Collaboration Between the Project Sponsor/Steering Committee and Project Manager

Our research shows that well-functioning, professional interplay at the project governance and project management levels is a prerequisite for project success. This is especially important for dealing with a project's contextual factors, where a lack of effective opportunities for discourse at the project management and project governance levels inhibits effective collaboration. Organizations should not see the increased overhead resulting from enhanced collaboration as a burden but as an investment in reducing the risk of failure. We provide two recommendations for ensuring effective collaboration.

Ensure Effective Discourse Between Project Governance and Project Management Personnel on the Project's Continually Changing Context. The Federal IT Steering Unit implemented this recommendation by including defined exchange platforms and specific topics for discussion by project management and project governance personnel in the HERMES standard. HERMES now requires regular meetings (e.g., at least every four weeks) between project management and the steering committee and also defines the topics that need to be discussed (risks, budget, time, scope and contextual factors) as well as communication principles (e.g., reporting honestly, refraining from glossing over problems and taking each other seriously).

Create Common Ground at the Project Governance and Project Management Levels at the Beginning of the Project. From the projects we examined, it was clear that providing the project management team with a written project mission statement and/or project charter was not sufficient for creating common ground between the project management team and steering committee members. To address this problem, the Federal IT Steering Unit has tested a new tool (called "project canvas session"¹⁸), which is being considered for inclusion in the HERMES project standard. This tool will ensure that, at the outset of a new project, the project management team, the project sponsor and steering committee members engage in a discussion, supported by visual aids, to create common understanding of the project's context and management.

B.6 Concluding Comments

For complex, large IT projects, state-of-the-art project management is a necessary but not sufficient condition for success. In the four "well-managed but failed" projects we

¹⁸ So-called because of well-accepted "canvas" tools for creating common ground for diverse teams dealing with ill-defined problems.

analyzed, project governance bodies launched projects with missions that were impossible to accomplish because the steering committees overlooked or did not adequately address various contextual challenges. In some of the cases, contextual challenges were not addressed from the start of the project; in others, they were not addressed as the project progressed. Illustrated by evidence from these four projects, we have presented a framework for analyzing a project's contextual factors and provided recommendations that will enable steering committees to avoid missions impossible and keep large, complex projects on track.

We believe that our findings and recommendations will not only encourage executives to set project governance as a key priority when implementing their IT and digital strategies, but will also provide actionable guidance for ensuring future IT project success.

Paper C – Digital Transformation Programs – Control in the Context of Agile and Traditional Approaches: A Multiple-Case Study

Table 12. Bibliographical Metadata Paper C

Title	Digital Transformation Programs – Control in the Context of Agile and Traditional Approaches: A Multiple-Case Study
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Abstract

Over the last years, digital transformation in organizations has been accompanied by a rise of agile principles and methodologies. Despite some few exceptions, the majority of organizations need to combine or manage the coexistence of agile and traditional management approaches to explore new digital technologies, exploit their benefits, and innovate business successfully. Up to the present, it is not well understood how organizations deal with both approaches within digital transformation programs. Drawing on control theory and the concept of ambidexterity, the purpose of this multiple-case study is to explore how traditional and agile components are managed within large digital transformation programs, what formal modes and styles of control are conducted, and which tensions in control arise. Besides identifying authoritative and enabling control modes, as well as for instance tensions concerning transparency and cadence of outcome delivery, the important dual and “translating” role of the program manager regarding control is emphasized through this study.

Keywords

Digital transformation program, agile, control, case study

C.1 Introduction

In the era of digitalization, most organizations have been undergoing fundamental transformations. Besides technological changes, digital transformation typically brings about business and organizational changes. In large organizations, transformation endeavors are often put into practice via large programs consisting of several projects consuming considerable shares of organizational capital expenditure (De Reyck et al., 2005; Reich, Gemino, & Sauer, 2008). Conducting digital transformation programs is complex (Matt et al., 2016; Purchase, Parry, Valerdi, Nightingale, & Mills, 2011). Furthermore, the failure rate of IS projects in general (Lagstedt & Dahlberg, 2018; TheStandishGroup, 2016) and specifically transformation projects (Ward & Uhl, 2012) has remained at a high level, despite the rising prevalence of project and program management methodologies and skilled workforce. Due to the close operational and strategic interplay of business and IT (Henderson & Venkatraman, 1993) a central requirement to digital transformation programs is to meet the challenges of aligning business and IT strategies. Another central requirement to digital transformation programs, which can be traced back to the considerable rise of agile methods over the last decade, is aligning traditional and agile approaches. While both traditional and agile methodologies have a long history, it is evident that the latter have gained momentum and are considered as the new mainstream not only in software development (Dingsøyr, Nerur, Balijepally, & Moe, 2012; Theocharis et al., 2015), but also in project management in general when looking for a way to successfully deal with uncertainty arising from an ever-changing environment (Hobbs & Petit, 2017; Rico, 2010). Nevertheless, traditional methods are not expected to being fully replaced, but rather accompanied by or combined with agile methods “[...]as there exist settings in which agile methods are either not (fully) applicable or cannot show their strength” (Theocharis et al., 2015, p. 150). Studies in the fields of both software development (Kuhrmann & Fernández, 2015; Theocharis et al., 2015; Vijayasarathy & Butler, 2016) and project management (Conforto & Amaral, 2016; Hobbs & Petit, 2017) indicate that a coexistence or combination of traditional and agile methods characterise current management practice. Thus, besides business/IT alignment, when it comes to management methodologies digital transformation programs require agile/traditional alignment. Although there is quite a body of knowledge about the adaption and adoption of agile methods in software development (Barlow et al., 2011; Boehm & Turner, 2005) and large IS projects (Hobbs & Petit, 2017; Rico, 2010) it is not well understood how organizations deal with agile and traditional approaches within

digital transformation programs. Drawing on control theory and the concept of ambidexterity, the purpose of this multiple-case study is to explore how traditional and agile components are managed within digital transformation programs, what formal modes and styles of control are conducted, and what tensions in control arise in the program. This interest is reflected through three research questions. Their elaboration is outlined in the following paragraphs.

Over the last years, studies about project management in the context of agile and traditional approaches have continuously been increasing (Hobbs & Petit, 2017). At the same time, there has been some research about program management (Gregory et al., 2015; Lahrmann, Labusch, Winter, & Uhl, 2012; Martinsuo & Hoverfält, 2018), but mostly ignoring agile and traditional approaches coming together. Following the call for research to further develop program management towards an organizational capability as intensifying dynamics in the organizational contexts are increasing the importance of an organizations' ability to change (Martinsuo & Hoverfält, 2018) and to contribute to closing the gap of knowledge regarding the management of digital transformation programs comprising of agile and traditional components the following first research question is posed:

RQ1: How do applied program management methodologies deal with digital transformation programs, which comprise traditional and agile components?

According to Matt et al. (2015) a critical issue to an organizations digital transformation is not only developing a proper digital strategy, but also to establish appropriate practices to control the transformation. Wiener et al. (2016) even state that a lack of control contributes to project failure and that it is thus important to increase knowledge on this topic to improve the success rate of future IS endeavors. Up to date, it is underexplored how digital transformation programs incorporating both agile and traditional components are controlled regarding mode and style, which leads to the second research question:

RQ2: How is control of digital transformation programs consisting of traditional and agile components conducted with regard to control mode and style?

As the paradigm of agile and traditional is fundamentally different (Boehm & Turner, 2004; Fernandez & Fernandez, 2008; Vinekar, Slinkman, & Nerur, 2006), with the first being change-driven and the latter being stability-driven (Boehm & Turner, 2004) it is expected that tensions regarding control will occur when realizing a digital transformation program consisting of both components. As programs require both stability and

change (Gregory et al., 2015) an ambidextrous perspective towards tensions in control of digital transformation programs comprising of agile and traditional components seems to be a suitable approach. Previous research suggests that managers generally prefer stability and thus traditional approaches over agile approaches (de O. Melo et al., 2013; Serrador & Pinto, 2015) and programs can exhibit a clash between program control and project autonomy (Gregory et al., 2015), but in none of these studies are the findings regarding agile/traditional management and program control tensions integrated. Thus, the following last research question is posed:

RQ3: What tensions in control occur in digital transformation programs consisting of traditional and agile components?

The present paper is organized as follows: While chapter 2 lays the conceptual and terminological foundation, chapter 3 introduces the theoretical framework of the study. In chapter 4 the research methodology is described and in chapter 5 the results within the single revelatory cases are presented. These results are then analysed and discussed in chapter 6 followed by the concluding chapter 7 outlining contributions and implications as well as limitations of the research.

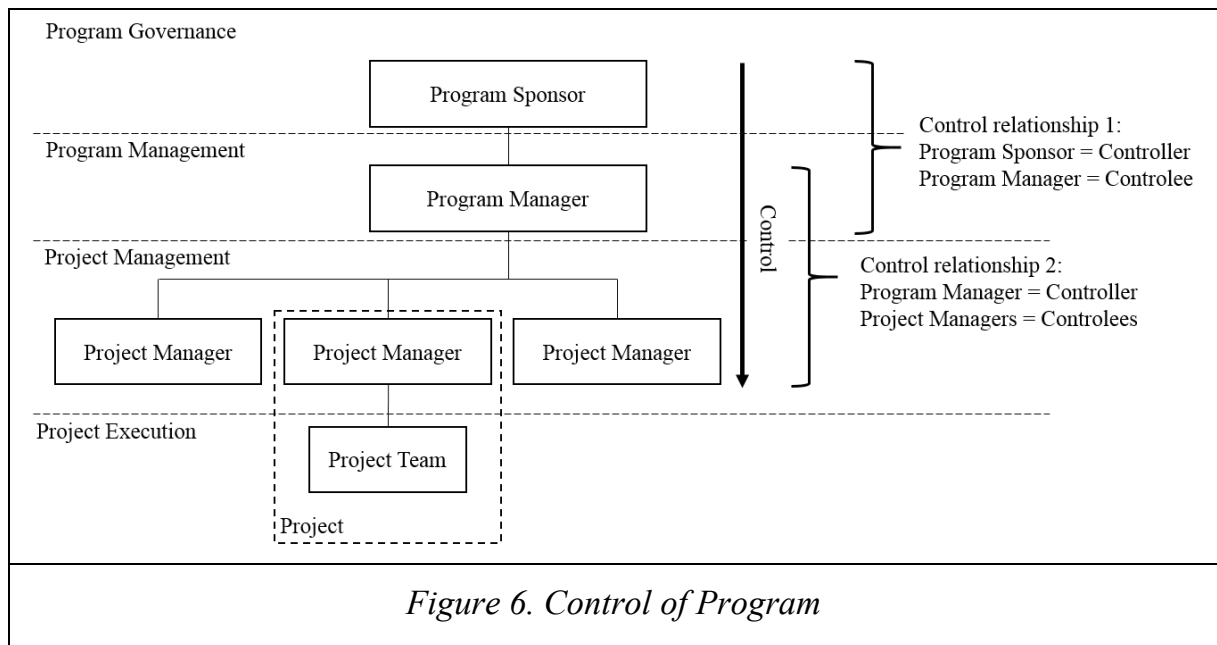
C.2 Conceptual and Terminological Foundation

In this chapter, the basic concepts are outlined considering related work and terminologies that are important for this study are explained.

C.2.1 Control of digital transformation programs

Projects are a widespread means to organizations to pursue change. A key rationale to group projects into programs is that the intended organizational benefit could not be realized through separate projects managed independently (Lycett et al., 2004; Turner & Müller, 2003). A program can consist of projects that existed prior to the program's launch or projects that were set up for the program (Vereecke, Pandelaere, Deschoolmeester, & Stevens, 2003) and are defined as "[...]a temporary organization in which a group 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). Compared to projects, programs show a higher level of complexity and uncertainty (Gregory et al., 2015; Pellegrinelli, 1997) with objectives being less specific and measurable (Turner & Müller, 2003), which influences control. A digital transformation program is a particular type of program involving the aim to achieve IS, business and organizational change (Gregory et al., 2015; Matt et al., 2016; Purchase et al., 2011). This

threefold aim is a typical characteristic of digital transformation programs compared to IS programs only focusing on changing IS or organizational transformation programs only focusing on organizational change (Barthel & Hess, 2019). These are central factors to be considered when setting up an appropriate management for digital transformation programs (Nieminen & Lehtonen, 2008). As within programs the local perspective (of each project) needs to be aligned with the global perspective (of the program and the organization) (Lycett et al., 2004; Vuorinen & Martinsuo, 2018), control plays a central role, also regarding successful completion (Gregory et al., 2015; Vuorinen & Martinsuo, 2018). Control can be understood as a dyadic process, in which a controller steers or adjust the behaviors of his or her controlees (Choudhury and Sabherwal 2003) in an attempt to achieve an alignment of individual (local) behavior with organizational (global) goals (Ouchi, 1979). Control of programs typically spans from the program governance level (i.e. program sponsor), over the program management level (i.e. program manager) to the project management level (i.e. project managers) (Gregory et al., 2015; Lycett et al., 2004). Thus, a program manager has a dual role when it comes to control: He or she can be a controlee (by the program sponsor) as well as a controller (of the project manager). Figure 6 shows how program control of programs is conceptualized in this study (see Figure 6).



According to Lycett et al. (2004), similarly to projects, a program's lifecycle consists of an identification, definition, execution, and closure stage. As projects are run in the program's execution stage, control from the program manager over the project managers starts then. Thus, this study focuses on control in the execution stage of programs.

Control of digital transformation programs is important for successful program progression but at the same time challenging, as the programs are complex, non-routine temporary organizations encompassing ambiguity and uncertainty due to possible changes of priorities, goals, contextual factors, stakeholder involvement, and team compositions (Kirsch, 2004; Wiener et al., 2016). In literature, there are many studies focusing on control in IS projects (Choudhury & Sabherwal, 2003; Wiener et al., 2016), even with emphasis in agile contexts (Harris et al., 2009), and some studies about control of programs (Gregory et al., 2015; Martinsuo & Hoverfält, 2018; Nieminen & Lehtonen, 2008; Vuorinen & Martinsuo, 2018), but none of them explicitly focuses on the dual role of the program manager. Furthermore, Wiener et al. (2016) revealed through their systematic literature review about control in IS projects that existing research primarily focuses on control portfolio configurations (i.e. what is controlled) and largely neglects control enactment (i.e. how control is put into practice). Together with the finding that there are only a few contributions to the understanding of control in digital transformation programs (Nieminen & Lehtonen, 2008; Vuorinen & Martinsuo, 2018), it can be said that there is a considerable lack of research on how control in digital transformation programs comprising of both agile and traditional components is actually taking place and what tensions occur.

C.2.2 Coexistence and combination of agile and traditional approaches

While most of the program management methods found in practice follow a waterfall idea and traditional control structures (Lycett et al., 2004), programs often contain both traditional and agile approaches, especially on the single project level. Traditional approaches can be defined as stability-driven following the assumption that objectives and deliverables of an endeavor can (or need to) be clearly defined upfront. Before the execution of a next stage begins, objectives, functionalities, risks, costs, schedules and resources are defined and planned (Cooper, 1990). Hence, traditional approaches are seen as attempting to minimize change and maximize stability during a projects lifecycle (Vinekar et al., 2006) and prescribing many procedures, and documentation templates in order to control the project's progression (Theocharis et al., 2015). On the other hand,

agile approaches assume that change is not only inevitable, but also necessary for a project to produce a useful outcome (Vinekar et al., 2006). They are thus also called change-driven (Dahlberg & Lagstedt, 2018). Agile approaches aim at avoiding “bureaucracy”, promote customer collaboration, and self-organizing teams working iteratively towards an outcome (Highsmith & Cockburn, 2001; Rico, 2010; Vinekar et al., 2006). They recommend decentralized decision making and are considered to work well in flat hierarchy settings (Boehm & Turner, 2004). Although agile methods, like Scrum, were initially developed for small projects, they have been scaled to larger project and program settings (Hobbs & Petit, 2017). One of the commonly used frameworks is for instance SAFe (i.e. Scaled Agile Framework), guiding organizations in collaboration, alignment, and delivery across a large number of agile teams (Leffingwell, 2015). Regarding control, traditional and agile approaches have different implications. As in other IS endeavors, resolute management control is considered as suitable when there are fixed budgets, time constraints, and strict requirements (e.g. regulatory, safety-critical, architectural) (Harris et al., 2009). In agile settings on the other hand, flexibility to change project plans and deliverables are needed (Harris et al., 2009; Serrador & Pinto, 2015). In this context, Serrador and Pinto (2015) for instance point out that a critical issue “[...]lies in the mismatch between the desire for early specification freeze and fixed plans with the concomitant need to maintain sufficient flexibility to modify and alter project plans to address critical business needs.” Although there has been a lot of research and practitioner discussions around the controversy of agile and traditional approaches underlining a dichotomous view (Fernandez & Fernandez, 2008), there is also evidence that both approaches are compatible in different types of endeavors (Boehm & Turner, 2004; Cooper & Sommer, 2016). On the one hand there are suggestions to a dualistic view and to build up a management that accommodates the coexistence of both approaches separately instead of replacing one by the other (Vinekar et al., 2006). On the other hand there are researchers who propose an integrated approach (Boehm & Turner, 2004; West, 2011), which is often referred to as hybrid methodology. Especially in the field of IS development, hybrid methods are often considered more successful than other methods particularly in large organizations as benefits of agile like adaptability can be realized without abandoning stability (Barlow et al., 2011; Boehm & Turner, 2004). A hybrid methodology that is gaining popularity in IS project practice is Water-Scrum-Fall (Schauderer, Overhage, & Fehrenbach, 2015; Theocharis et al., 2015; West, 2011). This methodology contains waterfall (traditional) steps in the beginning and at the end of a project and Scrum (agile) steps in the middle, during implementation (West, 2011). Despite the wide-ranging contributions within the field of software and IS development,

there is a lack of research on the coexistence and combination of agile and traditional approaches in digital transformation programs, which this study tries to address.

C.3 Theoretical Foundation

To explore control of digital transformation programs that comprise both agile and traditional components two theoretical lenses are employed. Control theory serves to identify different modes and styles of control, whereas ambidexterity is used as a perspective towards the identified tensions in control when agile and traditional approaches meet. Control theory as a lens has been selected because many studies show that it is a valuable theory to gain a deeper understanding about control in project settings, but at the same time it has not been applied to such a great extend in program settings and there is hardly any study using it as a reference theory in agile/traditional program settings (Wiener et al., 2016). Regarding ambidexterity, several researchers have advocated this concept as a means to realize benefits of agile and traditional approaches (Ramesh, Mohan, & Cao, 2012; Vinekar et al., 2006). Thus, ambidexterity is considered as a suitable additional lens for this study.

C.3.1 Control Theory

Control theory is based on the dyadic view of control being performed by a controller to regulate and adjust the behavior of a controlee (Choudhury & Sabherwal, 2003). There are five different control modes: input, behavior, outcome, clan, and self-control (Henderson & Lee, 1992; Jaworski, 1988; Kirsch, 1997; Ouchi, 1979).

While the first three are considered as formal, the remaining two represent informal modes of control (Jaworski, 1988). As the focus of this studies is on analysing control over program on program level in general, self-control referring to the individual level is excluded. Wiener et al. (2016) refer to the modes of control as parts of a control portfolio configuration and, in addition, emphasises the concept of control style as part of control enactment. Control style is understood as “[...]the manner in which the interaction between the controller and the controlee is conducted” (Wiener et al., 2016, p. 28). There are two control styles: authoritative and enabling. Authoritative control is a top-down control style that relies on bureaucratic values and is designed to ensure or enforce compliant controlee behavior without giving the controlee any influence on how control is taking place (Adler & Borys, 1996; Gregory & Keil, 2014). Enabling control on the other hand is a collaborative control style that is designed to ensure compliant controlee

behavior through allowing the controlee to deal with contingencies and frequently interact with the controller (Adler & Borys, 1996; Gregory & Keil, 2014). Both control styles apply for formal and informal controls (Wiener et al., 2016) (see Table 12).

Table 13. Control Modes and Styles Examples

Mode	Key Characteristics	Authoritative mechanism enactment (example)	Enabling mechanism enactment (example)
Input	The controller specifies, monitors, and manipulates allocation of financial, human, and material resources. The controlee is rewarded or sanctioned for his/her ability to utilize the available resources.	The controller (program manager) defines manpower allotment and thus prescribes the controlee (project manager) who is in a team	The controller (program manager) engages the controlee (project manager) in a dialog to define manpower allotment.
Behavior	The controller prescribes processes, procedures, and rules. The controlee is rewarded or sanctioned based on his/her compliance to the specified behavior.	The controller (program sponsor) prescribes the controlee (program manager) the use of a certain program reporting method	The controller (program sponsor) discusses various program reporting methods with the program manager- in the end they mutually decide which one is to be used.
Outcome	The controller specifies and evaluates both interim and final outputs. The controlee is rewarded or sanctioned based on the delivered outputs	The controller (program sponsor) defines program milestones and makes clear to the controlee (program manager) that they are not negotiable.	The controller (program sponsor) invites the controlee (program manager) to (re-)define milestones together.
Clan	The values and norms shared in a group of individuals who are interdependent (i.e. clan) motivates a controlee's behavior. Although clan control is primarily implemented by controlees, the controller can promote the development of shared values and norms.	The controller (program manager) requests all controlees (project teams) to develop a shared norm of mandatory meeting attendance (e.g. rituals)	The controller (program manager) invites all controlees (project teams) to a monthly lunch where an open discussion and socialization among project team members is promoted.

C.3.2 Ambidexterity in Programs

Ambidexterity is a capability that has originally been called for in organizational sciences to address contrasting demands when it comes to change (Gibson & Birkinshaw,

2004; Raisch, Birkinshaw, Probst, & Tuschman, 2009). Contrasting demands are for example referred to as the paradox of exploitation and exploration (Gibson & Birkinshaw, 2004; March, 1991), alignment and adaptability, as well as stability and change (Gibson & Birkinshaw, 2004). The ability to be adaptive to the changing and to be aligned with the existing environment is positively associated with successful change (Gibson & Birkinshaw, 2004). Contributions in this field also evocate a strong basis for a management approach being able to cope with agile and traditional approaches simultaneously (Tushman & O'Reilly, 1996; Vinekar et al., 2006). Whereas agility is needed for organizational adaption, stability is needed for organizational optimization (Vinekar et al., 2006). Thus, digitalization programs as temporary organizations require an ambidextrous approach (Gregory et al., 2015), also towards control. Nevertheless, organizational and managerial factors, like control modes and styles, can give rise to tensions to the simultaneous pursuit of agile and traditional endeavors (Vinekar et al., 2006).

C.4 Methodology

Due to the novelty of the topic and the lack of prior research on control of digital transformation projects comprising of agile and traditional components this research aimed at understanding the phenomenon in its real context. Therefore, a qualitative research design following an in-depth multiple-case study approach was chosen (Eisenhardt, 1989; Yin, 2009). A multiple-case design enables the possibility for more generalizability and the advancement of theory through cross-case analysis (Eisenhardt, 1989; Miles, Huberman, & Salanda, 2003).

C.4.1 Case selection

The case selection was guided by a reflection on the cases' expediency to gain revelatory insights (Yin, 2009). With regard to answering the research question, three large digital transformation programs, which (1) were embedded in a large, traditional parent organization with high project and pro-gram management maturity, (2) comprised agile and traditional management components, and (3) offered sufficient availability of relevant information were selected. Due to a long-lasting relationship with the three parent organizations of the programs (through our competence center for knowledge and experience exchange on the topic of digital transformation between scholars and practitioners) the fulfilment of the abovementioned criteria could be assessed accurately. According to Mintzberg (1979) an organization with 2'000 employees is considered as large, typically characterized by specialization and formalization. All organizations are based and mainly operate in Switzerland. The case programs all aimed at not only significantly

changing information systems, but also at changing the structures, processes and IT infrastructure of the parent organization. To guarantee anonymity of the cases, content and objectives of the program is only given on a generic level. At the time of study all programs were at the realization stage. An overview of the selected cases is presented in Table 2.

C.4.2 Data collection and analysis

Empirical data on the digital transformation programs was collected during eight weeks in spring 2019 through three main sources: (1) semi-structured interviews with program managers (and in two cases with their program management officer); (2) informal follow-up e-mails and skype calls; and (3) secondary data including public (e.g. information on organization website; official external audit reports) and internal material (e.g. organigrams; steering meeting protocols; management guidelines). For each of the three cases two interviews were conducted, which resulted in a total of 5 interviews lasting 60 to 90 minutes. After transcribing the recorded interviews follow-up questions were posed to several interviewees via e-mail or skype calls. The design of the semi-structured interview guide drew upon the recommendations of Schultze and Avital (2011) and split in two parts: While the first part had an open, exploring character to obtain rich information about the program's processes and context, the second part was more focused on control to get insights on how agile and traditional approaches are related to each other and how control is conducted. As the interest of the inquiry lied on program management processes and control interviewees representing the program management level (e.g. program manager or PMO manager) were selected (see Table 13).

Drawing on the recommendations of Eisenhardt (1989) a coding scheme based on the two theoretical lenses was developed and applied. Codes informed by control theory represented the outlined control modes and styles. Codes informed by ambidexterity represented the outlined duality of stability and change in the field of program management. The theory informed data analysis was followed by an open-coding where codes emerged during condensing the transcripts to identify themes (Yin, 2009). The triangulation of the interview findings took place through consultation of other public and internal data sources (e.g. program documents). Interview data was triangulated through consultation of follow-up material data and secondary data in order to mitigate the risk of information bias (Gibbert, Ruigrok, & Wicki, 2008; Yin, 2009).

Table 14. Description of the Case Programs

	Case / Program A	Case / Program B	Case / Program C
Parent Organization	Financial service provider (~5000 employees)	Logistics service provider (~40'000 employees)	Security service provider (~10'000 employees)
Content	Upgrading and integration of IS across whole organization; development of new products; organizational change	Upgrading and integration of IS along the organization's value streams; organizational change	Upgrading and integration of IS across whole organization; development of new products; organizational change
Objective	Focus on customer processes; efficiency in business processes; integrating IS	Transparency; establish a up-to-date basis for financial management; integrating IS	Efficiency in business processes; integrating IS
Duration (in y)	6	4	8
Cost (in million U.S. dollars)	~200	~100	~400
Outcome uncertainty	Average	Average	Average
Number of projects	5	5	7
Interviewee	Program manager	Program manager; Program management officer	Program manager; Program management officer

C.5 Results

While case C aimed at transforming a part of the organization (business unit), cases A and B aimed at transforming the whole organization. Furthermore, all programs are conducted through both agile and traditional methods in a traditional context. Meaning that the parent organization is organized traditionally, featuring formalized structures and processes, high degree of specialization and distinct hierarchy (Mintzberg, 1979). The programs under study consist of a different number of projects, are expected to last from four to eight years, and cost estimations range from 100 to 400 million U.S. dollars (see Table 2). In this chapter a short overview of each case structured along the two first research questions is provided. The identification of control modes and styles is structured according to the two previously outlined control relationships (see Figure 6). Due to space constraints the identified tensions in control are solely presented in chapter 6 (cross-case analysis).

C.5.1 Program A

Program A was initialized to accommodate six already existing projects that showed difficulties in progressing successfully towards realizing the organization's digital strategy of harmonizing and integrating processes across the whole organization when managed separately.

Table 15. Control Modes and Styles in Program A

		Style				Style	
		Authoritative	Enabling			Authoritative	Enabling
Clan	Input	Budget definition; Staffing	-	Control Relationship 2	Control Relationship 1	Budget plan definition	Regular dialog with controlees to define staffing
	Behavior	Reporting process through periodic reports; Program schedule	-			Reporting process	Use of SAFe practices and rules
	Outcome	Definition of final outcome, high-level requirements and milestones	Regular dialog to define and alter interim results			Specification of must requirements (e.g. compliance, security, architecture)	Regular dialog to define and alter product increment and backlog
	Clan	Definition of mission statement to be shared	-			Definition of reflection activities	Regular exchange meetings over lunch for socialization

The program methodology applied is a combination of a - from the parent organization prescribed - program management methodology based on the traditional paradigm and agile paradigm (i.e. SAFe), which has never been applied before. While the overarching program process and structure is kept traditionally consisting of four stages each followed by a milestones as well as a program sponsor and a program manager, the realization is structured in 5 streams, each representing a cross-functional project team covering an end-to-end process, that “works” agile. Every stream is led by a product owner representing the controlee controlled by the program manager in control relationship 2. In control relationship 1 the program manager is the controlee and the program sponsor the controller. The identified control modes and styles are listed in Table 14.

C.5.2 Program B

Despite the availability of an “off the shelf” traditional program management methodology, which has been used for many transformation programs before within the parent organization, a hybrid methodology was developed specifically for this program, combining traditional program management with agile management based on SAFe. Similar to program A, this program is structured in 5 streams (or agile project teams), each representing an end-to-end process or value stream of the organization.

Table 16. Control Modes and Styles in Program B

		Style				Style	
		Authoritative	Enabling			Authoritative	Enabling
Clan	Input	Budget definition	Regular dialog to define staffing	Control Relationship 2	Control Relationship 1	Budget plan definition	Regular dialog to define staffing
	Behavior	Reporting process through periodic reports	Set up regular meetings between program sponsor and manager; Set up program schedule			-	Mutually agreed upon reporting process and other SAFE practices and rules
	Outcome	Definition of final outcome as vision; Definition of must requirements and milestones	Regular dialog to define and alter interim results			Specification of must requirements (e.g. compliance, security, architecture)	Regular dialog to define and alter product increment and back log
	Clan	-	Mutual definition of mission statement and meeting rules			-	Regular exchange meetings to promote common values and norms

The program aims at establishing an up-to-date basis for financial management through upgrading and integrating IS along the organization’s value streams. The application of a new hybrid methodology to the program is seen as an experiment that according to the interviewed program manager “[...]has been working quite well, but has also been requiring many adjustments on the run and discussions with different involved actors to get everyone on the same page. Finding the right control configuration is an ongoing process, in which I, as program manager, have a key role”.

Due to these on-going configurations the identified control modes and styles (see Table 15) could change over the future course of the program realization. As in program A the product owner leading a stream is the controlee and the program manager the controller. Whereas in control relationship 1 the program manager is the controlee controlled by the program sponsor.

C.5.3 Program C

Program C is aimed at increasing efficiency of business processes and the innovation of new products and processes.

As in program B, the projects were set up simultaneously to the program. The program is organized following a traditional program management methodology that has been prescribed by the parent organization for many years and is not designed for programs containing agile projects. Nevertheless, while three projects are managed traditionally, four projects apply agile methods, within the program. Leading to two different groups of controlees controlled by the program manager - project manager leading a traditional and product owner (PO) leading an agile project - in control relationship 2. As in the other two projects in control relationship 1 the role of the controller is represented by the program sponsor and the role of the controlee is represented by the program manager (see Table 16).

Table 17. Control Modes and Styles in Program C							
Mode		Style			Style		
		Authoritative	Enabling		Authoritative	Enabling	
Clan	Control Relationship 1	Input	Budget definition, staffing	-	Control Relationship 2	Budget plan definition (both groups)	Regular dialog to define staffing (with PO group)
		Behavior	Reporting process through periodic reports	Set up of program schedule in dialog		Definition of reporting process (project manager group)	Mutually agreed upon reporting process and other agile practices and rules (PO group)
		Outcome	Definition of final outcome and milestones	-		Definition of must requirements (PO group) and milestones (project manager group)	Regular dialog to define and alter deliverables and prioritization (product owner group)
			Definition of mission and rules to be shared	-		-	Regular exchange meetings to promote common values (PO group)

C.6 Analysis and Discussion

While not claiming to be exhaustive, due to the limited number of cases and data sources within the cases, the program management methodologies, control modes and styles as well as the tensions identified via the in-depth study of the three cases are still valuable to develop some propositions.

C.6.1 Applied Program Management Methodology

Even though all case organizations had mature project and program management methodologies, none of them could apply an „off the shelf” program management methodology that suited the digital transformation program’s processes and structures. The available and in case A and C prescribed methodologies were not suitable for an agile/traditional program setting. Whereas in case B this misfit was recognized before the setup of the program, case A and C had to find ways to deal with it in the running program. Especially case A, which showed a fully agile project execution, had to adapt a lot. One

interviewee of this case for instance pointed out that “[...] *it was a huge challenge to convince the program sponsor to integrate agile through SAFe. But this was only one step, the next step was to convince him from refraining from some of the control mechanism like prescribed documentation forms and detailed definition of deliverables, which simply would impede agile execution*”. Against the background of Theocharis et al. (2015) finding, that organizations apply context-specific hybrid approaches combining agile and traditional approaches in software development, it comes with no surprise, that organizations also design hybrid solutions for the management of digital transformation programs. Nevertheless, it is surprising that none of the studied organizations could fall back to a methodology that only needed to be configured a little. Instead, all programs under study had to set up a new methodology either from scratch, or through many configurations. The attitude towards the program methodology design as an experiment as in case B, seems to be a flexible way to allow learning by doing and thus promising way to find the right agile/traditional alignment in the end. Particularly insights from case C even arouses the hunch that, manager’s think of agile methods to be only suitable to separately managed small projects and not designed for larger contexts and programs, that in their mind need rigorous and meticulous control. Exactly opposite to the suggestion of Lycett et al. (2004) saying that program level should focus on strategic alignment and refrain from overdoing control. As put forth by Hobbs and Petit (2017) in their mixed-method study considering agile methods in large projects in large organizations, this study also indicates that whether and where agile or traditional methods are used in programs is in some ways influenced by the personal preference and assertiveness of involved managers. This portends a certain amount of arbitrariness when it comes to the compilation of management methods within programs influencing the applied program management methodology as a whole. Regarding ambidexterity, all applied program management methodologies show a preference for stability and hence do not (yet) support the needed level of ambidexterity in the management of complex endeavors, like called for by Gregory et al. (2015) for example. This finding is to some extent contrary to the finding of Martinsuo and Hoverfält (2018, p. 143), who conclude that “[...]recent change program management research shows that program management is strongly deviating from the plan-and-control approaches[...]”.

C.6.2 Applied Control Modes and Styles

The results of the study show quite similar control mechanisms across the different modes but apply different control styles. Comparing all three cases it can be suggested, that the more agile components a case shows, the more enabling control is taking place

in both control relationships (e.g. Case B). Still all cases show enabling control style across all modes in control relationship 2, indicating that program managers conduct a more collaborative control style towards agile projects or value streams, which is a prerequisite for the proper application of agile methods (Maruping, Venkatesh, & Agarwal, 2009). The program manager in case B states in this context: *“In order not to inhibit agility it is necessary to involve the agile teams in planning processes.”* Furthermore, looking across the whole span of program control from program governance level to project management level, all cases indicate that program managers have a “translating” role between authoritative control of the project sponsor and the enabling and authoritatively addressed controlees at project management level. This finding can be underlined by the following interviewee (program manager case A) statement: *“My role as program manager is actually the role of a translator. I translate for example objectives and the degree of fulfilment between the agile project teams and the project sponsor”*. Moreover, case C shows a program manager who controls both traditional and agile projects simultaneously. This can be linked to a present ambidexterity in control relationship 2.

Based on the findings across the three cases, it is proposed that program management should be viewed as an enabler of ambidexterity within digital transformation programs. Especially, when there is a lot of uncertainty and ambiguity in the program’s contexts, there is a growing need to foster ambidexterity and find alignment between agile and traditional approaches.

C.6.3 Tensions in Control

In the following sections the identified control tensions are outlined and discussed. The tensions were all identified primarily through the interviews. To begin with, Case A with the highest agile prevalence and case C with the lowest agile prevalence among the three cases reported on less tensions than case B. Potentially because there were less spots where agile and traditional approaches met and thus less contrasting approaches towards control (Harris et al., 2009).

In the field of outcome control all cases showed a tension regarding fixed outcomes desired by program sponsor and emergent outcomes of the agile working teams. One interviewee (of case A) pointed out that *“the program sponsor is used to monitor performance as the degree of fulfilment of an objective. He is looking for the delta between the things defined and the things delivered. With the emergence of requirements and new tasks integrated to the backlog on the project execution level the objective changes*

continuously and he doesn't know anymore against what he can measure the degree of fulfilment or he doesn't understand why the degree of fulfilment suddenly dropped from 90 to 75 percent". This tension can also be connected to the different cadences of output delivery and changes made to the objective. Agile approaches are iterative and thus show a higher cadence (Vinekar et al., 2006). Furthermore, tensions in the field of outcome control were in one case related to the increased transparency coming from agile practices (e.g. the use of Kanban board or daily updated backlogs) and the delivery of intermediate results or products. *"In traditional settings a program sponsor and manager sees too less for too long, whereas in agile settings they see too much too soon."* as an interviewee of case A pointed out. Regarding input control case B reported tensions in resource planning. Nevertheless, where input planning was done in an enabling manner, for instance in all case programs in control relationship 2 regarding staffing, this tension was seen as less crucial. In the field of behavior control, the definition of traditional reporting processes by the sponsor is seen as causing tensions towards the agile principle of "only as much documentation as needed". Even in Case C where there is a hybrid program methodology specially designed for the agile/traditional program this tension is reported. In the field of clan control, in both control relationships no tensions were identified through the three cases.

All the above mentioned tensions can be based on the duality of stability and change as well as program control and project autonomy as also identified by (Gregory et al., 2015). Although not focus of this study the two interviewees of case C indicated two reasons for the tension in control: lack of mutual understanding as well as trust of the traditional oriented project sponsor and the agile oriented project execution teams. This could be a hint towards the direction of further investigation.

C.7 Conclusion

Despite the widespread use of traditional and agile project management approaches within large digital transformation programs in large organizations, it is not well understood how organizations actually manage traditional and agile components especially with respect to control. This research not only uncovers how traditional and agile project management components are combined respectively how their coexistence is managed, but also shows how control takes place, and which tensions arise. The presented multiple-case study consisting of revelatory cases provides both guidance to further research by uncovering pressing questions and inspirations for managerial actions which contributes to the successful realization of digital transformation endeavors.

This study takes a step in both further establishing ambidexterity and control theory as a lens in digital transformation programs. There has been limited research on understanding how ambidextrous capabilities regarding stability and change could be developed to control programs with an agile/traditional setup. Especially the program manager with his “translating” role is identified as having a central role when trying to manage conflicting (control) demands in agile and traditional components. This could also be a valuable insight for practitioners trying to increase ambidextrous capabilities in digital transformation.

While this study was not explicitly looking for possible reasons for tensions, lack of mutual understanding and trust were identified. Further investigations could focus on uncovering more and deepen the understanding of tensions and their source. A next step could also be to look for and elaborating solutions to the tensions. When consulting literature there are suggestions on where to focus. For instance, from an organizational theory perspective it has been claimed that unless there is a shift from management approaches only informed by a stability view towards management approaches where change is viewed as an inherent, ongoing process within change programs it will be difficult to achieve change successfully (Tsoukas & Chia, 2002). This means that digital transformation programs need to be changed on an ongoing basis and “made to work” through fine-tuning and adjustment to the context (Tsoukas & Chia, 2002). Farjoun (2010) goes one step further and claims that stability and change need to be viewed as interdependent and mutually enabling. Within a digital transformation program this would mean that unless there is an appropriate management approach combining and aligning agile (change view) and traditional (stability view) methods change cannot be achieved.

To better understand control of digital transformation programs it would also be valuable to incorporate more perspectives. Despite integrating the controller and controlee view in programs (as the program management level has this dual role), the tensions only represent the perspectives of program manager and program management offices. It would be an appropriate next step to investigate tensions also from program sponsor and project manager (or product owner) perspective to get to a fuller understanding of the topic. Furthermore, it would also be valuable to understand the interplay between the control modes and styles as suggested by Wiener et al. (2016).

As this study is a revelatory case study investigating three cases, it cannot be claimed that the exploration of control modes and styles as well as tensions is exhaustive. More-

over, generalizability is limited. To make the findings more exhaustive and generalizable further cases could be investigated qualitatively and / or a quantitative study could be conducted.

Paper D – Governance of Mixed Agile/Traditional Digital Transformation Programs

Table 18. Bibliographical Metadata Paper D

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Abstract

While agile principles and methods have become mainstream in IT solution development, they have also immersed project management and organizational design. This process, however, is gradual so that management and governance practice of digital transformation programs (DTP) often have to deal with a coexistence of agile and traditional components. Such coexistence leads to tensions as some agile principles and methods are incompatible with or even contrary to their traditional counterparts. Drawing on existing discourses on tensions and governance, the purpose of this paper is to (1) identify and analyze such tensions in the context of complex DTP, (2) explore the corresponding challenges for program governance, and (3) derive requirements to enhance current DTP governance practice to deal with those challenges. The data gathered from an in-depth revelatory dual-case study of large DTPs let us identify 18 tensions, 17 corresponding governance challenges, and derive 10 requirements for a “change-mode-agnostic” governance system.

Keywords

Agile, Digital Transformation, Transformation Program, Governance

D.1 Introduction

For most well established enterprises, which had been successfully operating in the pre-digital economy (Ross et al., 2016), the rise of the digital technologies has formed the call for digital transformation in order to stay competitive (Chanias et al., 2019). Many of these enterprises therefore have started to invest a considerable share of capital and set out for digital transformation programs (DTP) (Fitzgerald et al., 2014). DTP aim at transforming both IT and business processes and sometimes also redefining business models (Barthel & Hess, 2019). While DTPs are of strategic importance, expensive and complex (Matt et al., 2016; Purchase et al., 2011), they are also risky and failure rates are still on a high level (Ward & Uhl, 2012).

A central challenge in DTP is the coexistence of agile and traditional change modes (Gregory et al., 2015). Over the last decade, the traditional change mode focusing on stability, closeness, and control has been complemented by an agile change mode that focuses on fluidity, openness, and speed (Farjoun, 2010; Kotter, 2014). While agile principles and methodologies already became mainstream in IT solution development, also project management (Hobbs & Petit, 2017) and organizational design are increasingly influenced by the agile change mode (Horlach, Drews, & Schirmer, 2016; Vejseli et al., 2018). The coexistence of agile and traditional change modes incorporates contradictory demands from different stakeholders with regard to change process and outcome leading to tensions during digital transformation (Aghina et al., 2015; Soh et al., 2019). Such tensions can only rarely be solved by favoring one option over the other, but rather need to leverage synergies and inconsistencies through alignment of both sides (Smith & Lewis, 2011). Out of the various potential management responses, in particular, governance mechanisms have been identified for effectively handling tensions in digital transformation (Jöhnk et al., 2019). Especially senior managers in business and IT functions, who often act as sponsors or members of steering committees (STC) of DTPs, find it challenging to set up a governance system comprising formal and informal governance mechanisms to fit a context where agile and traditional change modes coexist (Vejseli et al., 2018). The coexistence of agile and traditional change modes and the arising tensions call for enhanced governance systems for DTPs, which have so far clearly preferred traditional change modes (command-and-control style leadership and plan-driven, mechanistic approaches) over organic and change-driven approaches (Peterson et al., 2002; Vejseli et al., 2018). Although there is a lot of research on digital transformation, most of the studies either only focus on tensions (Soh et al., 2019) or on governance challenges in bimodal IT organizations (Horlach et al., 2016; Vejseli et al.,

2018). Only few connect tensions with governance mechanisms in the domain of bi-modal IT organizations (Jöhnk et al., 2019), especially in the domain of DTP (Gregory et al., 2015). Thus, there is still a lack of studies on how agile/traditional tensions can be understood from a program governance perspective and how to enhance existing governance mechanisms to deal with such tensions in DTP. Therefore, we pose the following research questions to explore the topic:

RQ1: What tensions and corresponding challenges arise in agile/traditional digital transformation programs from a program governance perspective?

RQ2: Which requirements towards digital transformation program governance can be derived from the challenges observed arising from the coexistence of agile and traditional components in digital transformation programs?

To answer these questions, we conducted a revelatory dual-case study of two DTPs in well-established enterprises where the coexistence of agile and traditional change modes reportedly led to tensions and corresponding governance challenges. Comparing the two cases is especially interesting, as they are not only different in terms of organizational context, but also in terms of program structure. In the current exploratory stage of our research, this allows identifying a variety of tensions and deriving a broad set of requirements for program governance in mixed agile/traditional DTPs.

Following this introduction, we outline the conceptual foundations of our study and discuss related work. Afterwards, we describe our research design. The main part of the study presents the two cases. The findings section summarizes our analysis of tensions and the derived requirements for enhanced program governance. The final sections discuss the findings and outline implications for future research and DTP practice.

D.2 Conceptual Foundation and Related Work

In this section, we outline the focal concepts of this study and discuss corresponding related work.

D.2.1 Tensions in Agile/Traditional Digital Transformation Programs

While digital transformation can be understood as an on-going process incorporating business, organizational, and technological changes, at some point it most likely requires coordination and management through a temporary organization (Martinsuo & Hoverfält, 2018). Although practitioners have been labeling temporarily organized digital transformation endeavors differently (e.g., digital initiative, digitalization project),

most large-scale digital transformation endeavors are organized as programs (Martinsuo & Hoverfält, 2018) according to prevailing terminology (Pellegrinelli et al., 2015). Programs are common means for enterprises to pursue transformation and achieve strategic benefit (Turner & Müller, 2003). They represent a set of projects interrelated by goal-, task-, and resource-dependencies (Morris, 2013). A DTP is a specific type of program that incorporates the development or introduction of new technical solutions and IT processes accompanied by business changes (e.g., regarding processes, products and even business models). There is typically a variety of stakeholders and actors from business, IT, and sometimes digitalization units involved (Barthel & Hess, 2019).

For decades, most programs and organizational units have followed a traditional change mode, i.e. deployed waterfall-style change processes and traditional control structures (Lycett et al., 2004). Traditional approaches are stability-driven in nature. They emphasize efficiency and reliability, rigorous upfront planning, and stage-gate processes (Boehm & Turner, 2004; Dahlberg & Lagstedt, 2018). Moreover, they demand rigid documentation and “mechanistic” coordination and control (Theocharis et al., 2015). More recently, agile approaches are increasingly applied, from a single project level up to whole organizational units, especially in IT departments (Hobbs & Petit, 2017). Agile approaches are change-driven (Dahlberg & Lagstedt, 2018) and consider change as being necessary for a project to produce a useful outcome (Vinekar et al., 2006). They emphasize flexibility, incremental processes, and speed (Boehm & Turner, 2004). Furthermore, agile approaches try to avoid “bureaucracy,” promote customer collaboration, and emphasize self-organizing teams (Vinekar et al., 2006). Beyond the scope of independent software projects, agile approaches are not expected to fully replace traditional ones and mixed agile/traditional change modes are considered as new reality in larger organizational settings (Theocharis et al., 2015) such as DTP. Therefore, there are suggestions to organize change dualistically to accommodate the coexistence of both approaches separately instead of replacing one by the other (Vinekar et al., 2006). Some even call for an integration of both approaches (Boehm & Turner, 2004; West, 2011), which is often referred to as hybrid methodology.

As both change modes are based on incompatible or even partially contrary paradigms (Boehm & Turner, 2004), it comes as no surprise that competing demands arise in such ‘mixed’ DTPs. Competing demands can lead to tensions regarding a program’s process as well as its outcome, which can pose major challenges for program governance.

There have been research discussions around tensions in digital transformation from an bimodal IT governance perspective, where Jöhnk et al. (2019) for instance identified,

among others, the tensions “flexibility vs. predictability in strategic vision”, “simplicity vs. complexity in organization”, or “integration vs. autonomy in collaboration”. Moreover, Gregory et al. (2015) identified numerous tensions in digital transformation programs, such as “IT efficiency vs. IT innovation portfolio decision” or “IT program coordination vs. IT project isolation”. Nevertheless, there is a scarcity of knowledge regarding the tensions arising from the coexistence of agile and traditional change modes in DTPs and the corresponding challenges for program governance.

To guide our research on tensions, we draw upon the conceptualization brought forward by organizational science, where the rise of tensions is understood as inherent to any kind of organized change as it incorporates many competing demands (Smith & Lewis, 2011). Especially when environments become more fast paced and uncertain and organizational processes show more complexity, competing demands increasingly become salient (Smith & Lewis, 2011) and lead to tensions that can be classified as performing, organizing, learning, and belonging tensions (Jarzabkowski et al., 2013; Smith & Lewis, 2011). Although all four types of tensions can arise during an enterprise’s digital transformation (Soh et al., 2019), this study sets out to focus only on performing and organizing tensions. Performing and organizing tensions are closely linked to governance responsibilities in programs such as setting goal and vision, defining steering and control structures, and defining processes (Ahola et al., 2014; Martinsuo & Hoverfält, 2018). Performing tensions are based on the multitude and heterogeneity of stakeholders that evoke the clash of competing strategies and goals (Martinsuo & Hoverfält, 2018). Examples are efficiency versus innovation strategies (Gaim & Wåhlin, 2016; Gregory et al., 2015) or innovation process efficiency versus product benefit goals (Harmsen et al., 2009; Svahn et al., 2017). Organizing tensions refer to competing structures and processes to achieve a desired outcome (Smith & Lewis, 2011). Examples are processes focusing on stability and processes focusing on change (Farjoun, 2010; Gregory et al., 2015) or agile versus disciplined software development (Boehm & Turner, 2004).

D.2.2 Governance of Agile/Traditional Digital Transformation Programs

The main aim of governance in the context of transformation programs is to ensure the delivery of defined outcomes, the realization of benefits and thus program success. Hence, governance “[...]is a key driver to «make things happen» [...]” (Luna, Kruchten, & Moura, 2015, p. 2) in a program. Previous studies have found that governance plays a pivotal role to change processes organized in programs or projects (Crawford et al., 2008; Winter et al., 2019) and IT organizations (De Haes & Grembergen, 2008; Peterson

et al., 2002; Vejseli et al., 2018). From a governance perspective, agile and traditional change modes in DTP have different implications: In a traditional approach, resolute management control is considered as suitable as there are agreed budgets, time constraints, and requirements to be met (Harris et al., 2009). Whereas, an agile approach calls for more organic governance and flexibility with regard to changes in project plans and deliverables (Harris et al., 2009). Nevertheless, it has yet not been fully understood how governance should be enhanced to accommodate both approaches in DTP. Program management practices (also of mixed or hybrid programs) have reached a high level of maturity in organizations, and much research has been conducted in order to improve DTP processes and management methods (Gregory et al., 2015). Surprisingly, there is a lack of practical and academic knowledge on supporting the systematic design of governance mechanisms (Jöhnk et al. 2019), especially in the presence of tensions such as those arising from the coexistence of agile and traditional change modes.

In this study, we draw on the broader governance definition, which conceptualizes governance as the entire system comprising all governance mechanisms (Ahola et al., 2014), in order to explore the tensions in mixed agile/traditional DTPs and to derive corresponding requirements for enhanced governance.

In line with the discussions in both project and IT governance domains, we understand program governance as a set of formal and informal mechanisms. Formal governance uses structural and procedural mechanisms (De Haes & Grembergen, 2008). Structural mechanisms refer to organizational structures, such as program set up and specific roles and responsibilities therein (Ahola et al., 2014; De Haes & Grembergen, 2008). Procedural mechanisms represent measures that institutionalize decision-making, monitoring, control, and resource allocation (Peterson et al., 2002), such as reports or strategic planning (Jöhnk et al., 2019). Informal governance uses relational mechanisms, i.e. participatory activities, collaboration, partnerships, shared understanding among stakeholders, and joint commitments (De Haes & Grembergen, 2008).

D.3 Research Design

In order to identify tensions in agile/traditional DTPs and subsequently derive requirements for a suitable governance system, we conducted a revelatory dual-case study. We report on case selection and description in the following sections.

D.3.1 Case Selection and Description

As tensions in mixed agile/traditional DTPs and the resulting governance challenges are still underexplored and a nascent research topic, we looked for DTPs that offer revelatory, unique, and exemplary sources for an in-depth insight into our topic rather than a large number of DTPs to foster generalizability (Yin, 2009). Therefore, we selected two large-scale DTPs of two well-established (not “born digital”) enterprises that met the following criteria: exhibit (1) the coexistence of traditional and agile change modes, (2) tensions between the two change modes, (3) resulting challenges for program governance, and offer (4) a broad access to rich data (see Table 18)

<i>Table 19. Overview of Cases</i>		
Case	Interaction Platform (case 1)	Merchandise System (case 2)
Program Objectives	Improve customer and partner experience, standardization and automation of processes to increase efficiency, set up a sustainable, extendable platform	Develop extendable business platform, increased speed of demand realization, reduce compliance risks, increase transparency and efficiency of merchandise process
Program Duration	6 years	7 years
Cost	\$ ~100 millions	\$ ~150 millions
Organization	Insurance (<10'000 employees)	Retail (>100'000 employees)
Degree of Org. Agility	low	medium

Case “*Merchandise System*” is embedded in a large European multi-national retail company. It aims at modernizing the enterprise systems for the merchandising processes from procurement to distribution, aiming at establishing a flexible digital platform for integrating peripheral systems and partners. To conduct the modernization of the enterprise systems and meet the technical and business requirements, a so-called “product house” was set up as an agile unit based on SAFe. The program further comprises four traditionally managed projects aimed at the rollback of a standard software application in certain countries.

Although both organizations are hierarchically structured, the retail enterprise has always fostered a strong entrepreneurial culture and has a higher degree of organizational agility compared to the insurance company. Nevertheless, governance structures and

processes in both cases are clearly oriented on traditional change modes (e.g., rigid control, extensive upfront planning) and are thus not well suited to handle challenges arising from the tensions in mixed agile/traditional DTPs.

D.3.2 Data Collection and Analysis

A long-lasting partnership with the two enterprises enabled an in-depth data collection. In a first step, data was collected through 13 semi-structured interviews with actors on program governance level (e.g., program sponsor, steering committee (STC) member, project portfolio manager) and actors on program management level (e.g., program manager, agile coach, program management officer) (see Table 19). Thereby we were able to gain insights from both “governing” and governed” actors on program level.

Table 20. Overview of Interviews and Focus Groups

Case	Interaction Platform (1)	Merchandise System (2)
Interviews	Program Sponsor (CTO), STC Member 1, Program Manager 1, Program Manager 2, Agile Coach, Project Portfolio Manager 1, Project Portfolio Manager 2 <i>Conducted in December 2019</i>	Program Sponsor (CIO), STC Member 1, STC Member 2, STC Member 3, Program Manager, Program Management Officer <i>Conducted in June 2019</i>
Focus Group	In addition to interviewees: STC Member 2, Project Manager <i>Total number of participants: 9; Conducted in January 2020 during a 3.5h workshop</i>	In addition to interviewees: STC Member 4 <i>Total number of participants: 7; Conducted in December 2019 during 2x2h workshop</i>

The interviews lasted approximately 60 minutes and were guided by a semi-structured questionnaire based on the recommendations of Schultze and Avital (2011). The questionnaire had two parts: Part 1 had an open, exploring character to gain rich data about the tensions and corresponding challenges for governance as well as the general program context. Part 2 focused on how the governance systems should be improved in order to be able to derive requirements. In addition to the interviews, we not only used internal documents (e.g., digital strategy, governance frameworks) and program management material (e.g., project charter, roadmaps), but also conducted a focus group workshop for each case to triangulate, discuss and evaluate our findings with program actors representing program management and governance (see Table 2) following the guidance of Krueger and Casey (2014). In accordance to other revelatory case studies (e.g., (Sarker,

Sarker, Sahaym, & Bjørn-Andersen, 2012)) , we consider 7 resp. 6 interviewees and focus group workshops with 9 resp. 7 participants as justifiable in the present exploratory phase of our research. We analyzed the transcribed source texts firstly case by case in order to identify tensions and governance challenges in each case and code them thematically. Afterwards, we structured the tensions and governance challenges according to existing theory. Thus, our overall data analysis followed the qualitative data analysis process of Kuckartz, Dresing, Rädiker, and Stefer (2008).

D.4 Results

In this section, we present the identified tensions between agile and traditional components in DTP and the corresponding challenges structured by tension type (organizing and performing tension). Moreover, we summarize the observed governance challenges and the derived requirements for enhanced program governance. In summary, we identified 18 tensions, of which 12 represent organizing and 6 represent performing tensions, and derived 17 corresponding governance challenges.

D.4.1 Organizing Tensions and corresponding governance challenges

We structured the tensions found along three domains: (1) Delivery Process, (2) Plans & Resources, and (3) Team Operations. These domains also represented codes (influenced by the above mentioned governance literature) used by the research team during data analysis. Table 3 presents the tensions assigned to each domain. For each tension, the frequency of interviews where it was reported is indicated in brackets. Moreover, the identified governance challenges are outlined including the primary source (Case 1 and/or 2). For later reference, we numbered the challenges.

Regarding delivery process, “high vs. low delivery cadence” and “iterative vs. linear processes” were highlighted most in both cases. From a governance perspective, these delivery process tensions lead to the challenges of finding a suitable way for monitoring the program’s progress and of linking the iterative delivery process of agile and traditional projects through suitable docking points. In terms of quality assurance, seeing (interim) results too early or too late was mentioned as a cause for risking premature resp. late interference. Another governance challenge is accommodating the need of two different decision-making speeds. While agile projects rely on fast decision making, traditional projects are used to slower decision making.

Table 21. Organizing Tensions and Resulting Governance Challenges

Domain	Tension (# of interviews)	Governance Challenge (Case 1 and/or 2)
Delivery Process	High vs. low delivery cadence (11) Iterative vs. linear process (10) Early delivery vs. late delivery (7) High vs. low status visibility (5)	[1] Danger of too early resp. late interference (1&2) [2] Finding suitable docking points to link iterative and linear processes (1&2) [3] Two Decision-making speeds needed (1&2) [4] Finding ways to monitor program progress (1&2)
Plans & Resources	Continuous vs. upfront planning (10) Flexible vs. fixed plans (10) Backlogs vs. “classic” project plans (4) Fixed vs. ad-hoc mixed teams (4)	[5] Handling different moving targets (time, cost, benefit, features) (1&2) [6] Match backlogs and classic project plans (1) [7] Assigning people to teams (1)
Team Operations	High vs. low team autonomy (12) New (agile) vs. old (traditional) roles (7) Agile vs. traditional terminology (6) Minimal vs. maximal documentation (4)	[8] Apply both enabling and authoritative control style (1&2) [9] Combine agile and traditional roles (1&2) [10] Mitigate the risk of misunderstandings regarding terms and concepts (1&2) [11] Identify adequate generic reporting standards (1)

In the plans and resources domain, “continuous vs. upfront planning” as well as “flexible vs. fixed plans” were mentioned by most of the interviewees in both cases. The resulting governance challenges are having to handle resp. decide what types of targets (time, cost, benefit, features) should be defined to suit both agile and traditional approaches in a program. Another challenge arises from the tension between the different planning artifacts. While agile teams work with product and sprint backlogs consisting of user stories that will be jointly refined, traditional teams use “classic” plans which are often interlinked by work packages with clearly top-down defined deliverables. Furthermore, some interviewees of case 1 reported that there had been issues regarding capacity planning as both agile teams and ad-hoc traditional teams (set up for a specific task) needed to be staffed.

In the team operations domain the most prominent reported tension is “high vs. low team autonomy”. This was connected to the governance challenge of needing to apply both enabling as well as authoritative control styles to agile resp. traditional projects. Another issue arose from the mix of new (agile) and traditional (old) roles. Interviewees of both

cases, especially on program governance level, reported difficulties with defining all needed roles and their responsibilities for the DTP as there is a lack of templates and best practices for mixed agile/traditional settings. Moreover, the tension regarding agile and traditional terminology was reported to lead to communication challenges and misunderstandings within the program. In addition, case 1 reported minimal documentation and maximal documentation in agile resp. traditional projects to lead to the difficulty to define common reporting standards.

D.4.2 Performing Tensions and corresponding governance challenges

As with organizing tensions, we structured the identified tensions during data analysis via codes. The two superordinate codes “Goals” and “Strategy” now represent domains. In analogy to Table 20, Table 21 presents tensions of this type and resulting challenges. These domains also represented codes used by the research team during data analysis. Table 21 presents the tensions assigned to each domain.

The two major governance challenges in the goals domain are handling divergent goals and missing process and product goal alignment. Whereas agile projects appear to aim primarily at a high outcome value, traditional projects appear to emphasize process efficiency and adherence to defined project standards as overarching program goal. Nevertheless, when focusing solely on the outcome, agile projects emphasize minimal viable products and traditional projects strive for a complete product (according to respective requirements). In addition, agile teams are more focused on delivering an innovative product, whereas traditional teams aim at efficient products. This leads to the governance challenge of finding and applying different program success and fulfilment degree measures (accommodating process and product KPIs).

With regard to the strategy domain, the tension of “changing vs. stable deliverables” was highlighted most often. Another prominent tension is “problem vs. solution focus” in agile resp. traditional projects. These tensions are, to some extent, related to the organizing tensions in the domain plans and resources and lead to the challenge of deciding how to define the problem and / or solution and to find a commonly grounded strategy fitting both change modes. Moreover, case 2 revealed the tension “quick (small) vs. big (long-term) wins when it comes to program strategy. This leads to challenges regarding the identification where which strategy should be followed and how to ensure on the program level that both quick wins are realized and, at the same time, the path to aspired big wins is not lost.

<i>Table 22. Performing Tensions and Resulting Governance Challenges</i>		
Domain	Tension (# of interviews)	Governance Challenge (Case 1 and/or 2)
Goals	Outcome value vs. process efficiency (9) Minimal viable vs. complete product (9) Innovative vs. efficient product (7)	[12] Handling divergent goals (1&2) [13] Missing process and product goal alignment (1&2) [14] Need for different measures for program success and degree of fulfilment (1&2)
Strategy	Changing vs. stable deliverables (11) Problem vs. solution focus (8) Quick (small) wins vs. big (long-term) wins (4)	[15] Lack of commonly grounded strategy (1&2) [16] Unclear degree of problem and solution specification (1&2) [17] Enable quick wins and at the same time don't lose track of aspired big win (2)

D.4.3 Requirements for Enhanced Program Governance

The interviews revealed not only tensions, but also the strong urge to find ways to deal with the arising challenges. By desk research and two focus group workshops, we derived 10 requirements for a so-called “change-mode-agnostic” governance system that accommodates both an agile and a traditional change mode. Table 22 lists the 10 derived requirement and the respective governance challenge(s) they primarily address. For the requirements, the respective type of governance mechanism (i.e., structural = S, procedural = P, and relational = R) is indicated in brackets.

Requirements 1, 2, 3, and 5 offer the possibility to address many governance challenges at the same time. Requirement 1 can be seen as a general foundation of mixed agile/traditional governance that needs to be institutionalized through suitable governance interventions. With regard to the distribution of governance mechanism types, most of the requirements refer to procedural or relational mechanisms.

Table 23. Found Performing Tensions and Governance Challenges

#	Requirement (<i>type of governance mechanism</i>)	Addressed Governance Challenge(s)
1	Stress the (importance of the) coexistence of agile and traditional approaches within the program (R)	all
2	Work with vision sketches rather than stable plans (P) and regularly update sketches to align goals among all relevant program participants (R)	3, 5, 6, 13, 15
3	Work with roadmaps entailing business-oriented milestones (P) and regularly seek for joint commitment (R)	2, 6, 12, 13, 15, 17
4	Emphasize problem understanding and only concretize solution requirements where and when needed (P)	10, 16
5	Set up network-like program structures (S) that allow short and flexible decision-making processes (P), establish cross hierarchy collaboration (R)	1, 3, 8, 9
6	Reduce formal approvals to a minimum and shift coordination focus to consulting (with veto rights) (P)	3
7	Define different KPIs for program, agile projects and traditional projects; Define a flexible reporting standard (P)	4, 5, 8, 11, 14
8	Define all necessary agile and traditional roles and responsibilities as well as processes (S)	8, 9, 10
9	Ensure active rather than reactive governance of steering committees (P)	8
10	Separately (re-)plan and (re-)assign agile and traditional capacities on a regular basis (P) together with project managers (R)	7

D.5 Discussion

Apart from the tensions “innovative vs. efficient product”, “changing vs. stable deliverables”, “high vs. low team autonomy”, which have been identified in the context of bimodal IT (Jöhnk et al., 2019) and DTP (Gregory et al., 2015) many of the tensions appear to be novel findings of this study. Furthermore existing research identified problems when agile and traditional approaches meet, but do not conceptualize them as tensions, but rather as barriers to agile approaches (Boehm & Turner, 2005; Hobbs & Petit,

2017). The ten stated requirements provide evidence that, for agile/traditional alignment, enhanced DTP governance needs to embrace agile principles and practices more systematically. This is not too surprising as existing literature on the coexistence of agile and traditional change modes in the context of projects (Hobbs & Petit, 2017; Stettina & Hörz, 2015) or general IT change (Horlach et al., 2016; Vejseli et al., 2018) claims that current governance systems have not been sufficiently adapted to cover agile practices.

D.6 Summary and Outlook

This study contributes to a better understanding of tensions in mixed agile/traditional DTPs and the resulting challenges for program governance. Based on two in-depth analyses of large DTPs, we identified 18 tensions and 17 resulting governance challenges, which were subsequently used to derive 10 requirements for “change-mode-agnostic” DTP governance. The findings may help practitioners to understand governance challenges in mixed agile/traditional DTPs. Moreover, although still on a meta-level, the derived requirements can support the adaption of governance systems towards an active guiding function in mixed agile/traditional DTPs. Such an adaption would bring some fundamental differences to current governance practices: a changed role of modeling and models (“sketches instead of plans”), an extended portfolio of intervention (“orchestration instead of coercive control”), and a different overall style (“coaching instead of policing”). This research also provides fertile ground for future research. A next step would be to investigate additional large-scale DTPs and also gain data from actors of operational levels to validate and extend the empirical basis and overcome the current limitations of the findings with regard to generalizability and multi-perspectivity. The diversity of DTPs would also warrant to analyze context contingencies and design governance system customization/configuration options. Another avenue for future research would be to develop design principles for governance artefacts.

Paper E – Governance for a Multi-National ERP Program in a Decentralized Organization – How Arbonia Doors Set Up a “Glocal” Governance Enabling Both Local Differentiation and Global Consistency

Table 24. Bibliographical Metadata Paper E

Title	Governance for a Multi-National ERP Program in a Decentralized Organization – How Arbonia Doors Set Up a “Glocal” Governance Enabling Both Local Differentiation and Global Consistency
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Abstract

Situation faced: In 2019, Arbonia Doors, the door division of Arbonia Group (a multi-national building supplier corporation), decided to implement SAP S4/HANA to realize global harmonization and integration across four highly autonomous local subsidiaries. In the early phase of the program, it became clear the program can only succeed if the gaps that exist between the aims of the four local subsidiaries and the aims at the division level can be bridged or even closed. This called for governance measures that address the tensions evoked by a decentralized organizational context.

Action taken: Armed with an understanding of governance as a means of control and coordination to deal with contrasting objectives within a pro-gram, the program manager and program sponsors decided that the identified tensions should be tackled through a set of appropriate governance measures. From the outset of the ERP program, Arbonia Doors set out to design, implement, and evaluate nine “glocal” governance measures ranging from program structures to community building measures.

Results achieved: Through the “glocal” governance measures, Arbonia Doors enabled both local differentiation and global consistency. Not only was it possible to define a consensual degree of process harmonization, but a boundary-spanning sense of community and collaboration was also established. This is expected to be valuable for future digital transformation programs in the group.

Lessons learned: A joint reflection with the program team on the de-signed “glocal” governance framework resulted in seven lessons learned that promise to be projectable to digital transformation programs in general: (1) Continuously frame an ERP endeavor as a major step in the digital transformation journey rather than as a large, complex IT program; (2) Actively strengthen the understanding and handling of tensions as a both-and rather than an either-or decision; (3) Start early and allow developing of governance measures by trial and error; (4) Foster co-creation of governance; (5) Cover formal as well as informal governance mechanisms; (6) Develop a clear strategy on how to include external partners; (7) Systematically demonstrate the effects of governance measures.

Keywords

Action Design Research, Digital Transformation, ERP, Governance, Program

E.1 Introduction

Digital disruption has forced many well-established organizations - successfully operating in the pre-digital economy - to embark on a digital transformation journey in order to stay competitive (Chanias et al., 2019). They do so by investing a substantial share of capital into programs that aim at transforming both IT and business processes and sometimes even entire business models (Barthel & Hess, 2020). ERP system implementations or upgrades often constitute a major step towards digital transformation as well as one of the biggest programs the organization has ever launched (Moon, 2007). Unfortunately, the majority of these endeavors still fail and - in the worst case - lead to considerable financial and organizational disasters (see for example Kolf and Kerkmann (2018)).

The reason for program failure often lies in insufficient or inappropriate governance rather than poor management (Kiselev, Winter, & Rohner, 2020).

There are various definitions of governance in literature and practice, which vary in scope and focus. We understand governance not only in the narrower sense as the monitoring and control activities of specific governing actors such as program owners or steering committees (Lechler & Cohen, 2009) but also in a broader sense as a set of governance measures of control and coordination that ensure “the right things are done” (e.g., regarding program goals) and “the things are done right” (e.g., regarding program processes) (Ahola et al., 2014; Turner & Keegan, 2001). This set of governance measures (i.e., governance framework) defines the program structures allocating rights and responsibilities to various actors within the program. It defines how goals are set, decisions are made, and program progress is monitored and coordinated. Moreover, governance aims at addressing contrasting demands that threaten to impede the realization of goals and benefits of an endeavor (Williamson, 1999).

The challenges surrounding ERP programs and possible governance solutions have been a major concern for executives across industries. ERP programs implement a strategic tool, which integrates not only information and processes within and across organizational functions but also across organizational boundaries; for instance, across a group’s subsidiary companies. Therefore, such pro-grams are rife with tensions arising from the different, often contrasting intentions and expectations of the many stakeholders involved (Warner & Wäger, 2019; Wiener et al., 2016). A well-governed ERP program is able to accommodate these tensions.

In the case at hand, Arbonia Doors decided to implement SAP S4/HANA to realize global harmonization and integration of information and processes across four highly autonomous local subsidiaries.

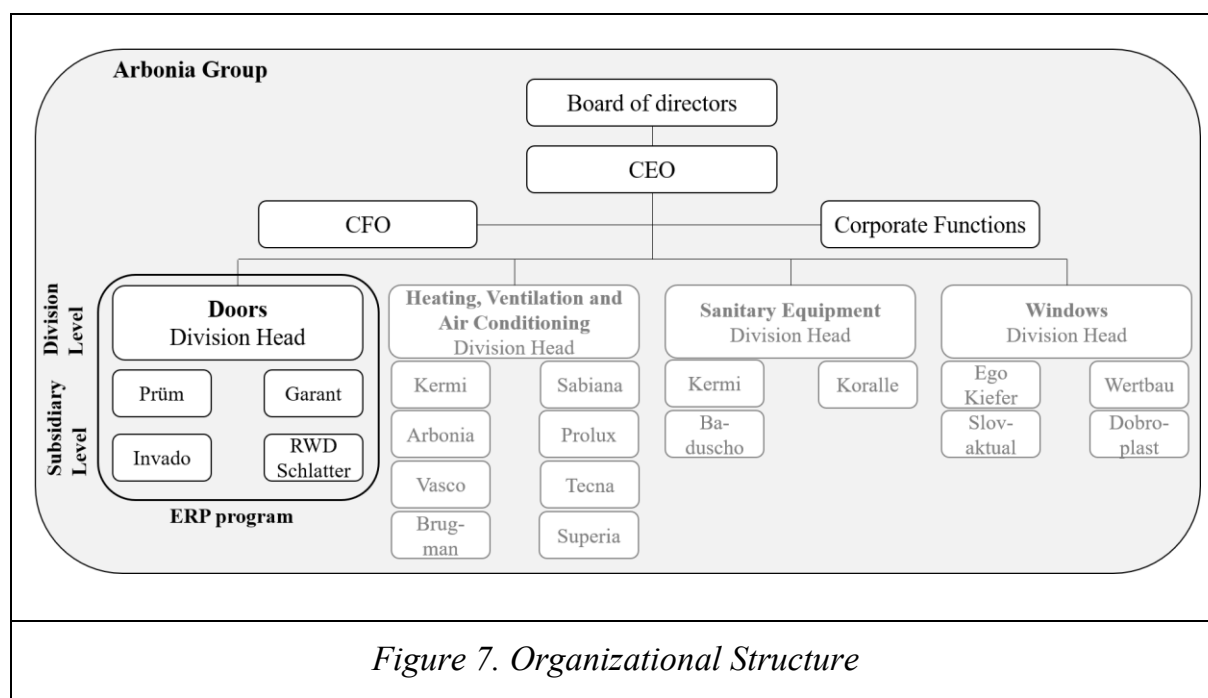
Arbonia Doors is a business unit of Arbonia Group and - as in practice - in the remaining book chapter also referred to as the Doors' Division (see Figure 7). Arbonia Group is a publicly listed European building supplier with headquarters in Switzerland. The group is active in 70 countries worldwide with around 8,400 employees. Arbonia Group consists of four divisions: Heating, Ventilation and Air Conditioning, Sanitary Equipment, Windows, and Doors. Each division comprises three to eight subsidiary companies.

Arbonia Doors comprises four subsidiary companies, Prüm, Garant, Invado, and RWD Schlatter, with production sites in Germany, Switzerland, and Poland. These companies manufacture interior doors, functional doors, and frames. In all three domestic markets, Arbonia Doors holds a leading position. Moreover, it boasts an average headcount of 1,960 (as of 2019, in FTE), and with net revenue of 356.4 million CHF, Arbonia Doors accounts for around 25% of the Group's net revenue (as of 2019).

From the outset of Arbonia Doors' ERP program, it was clear to the Doors Division's management that the decentralized organizational structures with highly autonomous subsidiaries, which had proved successful for business operations for many years, would be a challenging organizational context for a cross-subsidiary ERP project aiming at integration and harmonization. Therefore, at the outset of the program, the program management sought to identify and analyze the tensions within the program that were evoked by the organizational context. Furthermore, they decided to set up appropriate "tension-aware" governance measures to deal with these tensions and move the whole Doors Division in a strategically aligned direction, allowing local differentiation and global consistency and facilitating the required organizational change for further digital transformation within the whole group.

The present case (1) shows how a set of governance measures enables both local differentiation and global consistency in goal definition and realization and (2) how the corresponding risks for an ERP program in a decentralized organizational context are addressed and (2) sheds light on the foundations laid for the successful ongoing digital transformation journey of the whole group. Thereby, this chapter addresses researchers interested in a better understanding of tensions in organizational contexts and govern-

ance of ERP programs. Moreover, it addresses managers and members of program steering committees looking for appropriate governance measures in a global ERP endeavor within a large decentralized organizational context.



The case description promises to be valuable for companies that are seeking to upgrade or implement a new enterprise-wide information system but may not be aware of the tensions and corresponding program risks awaiting. Moreover, the case presents “glocal”¹⁹ governance measures as a solution to align the different and often contrasting demands and perspectives of the various stakeholders involved in such an endeavor.

E.2 Situation Faced

In 2019, Arbonia Group management and Arbonia Doors’ management decided to implement SAP S4/HANA across all four subsidiary companies to replace existing local systems and harmonize processes. They knew that a heterogeneous systems landscape will prevent them from keeping up with changing requirements regarding functionality, automation, division-wide process management, data quality, and integration in the digital age. At that time, the Division Head said: “To achieve data-driven digital innovation, increased efficiency and lay the technical foundation for the digital transformation and

¹⁹ We understand «glocal» as an approach that balances global and local interests through aligning local and global measures / goals or mixing up local and global representatives in teams.

growth across the whole Division and beyond we need consistent transparency and accountability through standardized data and harmonized processes and new functionalities across all business units. The base of this is a clear understanding and implementation of end-to-end processes.”

In the same year, the Doors Division launched its ERP program, which was to be realized in an ambitious time and budget frame. Their ambition is to implement an ERP based on SAP best practice scenarios according to the different manufacturing logics (i.e., make-to-stock, make-to-order, make-to-engineer) to achieve standardization and harmonization of the systems and process landscape and realize the following benefits: (1) increase efficiency and process reliability, (2) increase data quality and transparency (3) improve control of operations and costs, (4) improve decision-making (efficacy and speed), (5) improve information dissemination, (6) strengthen innovation, (7) foster automation capability across all subsidiaries, and (8) ensure a consistent basis for further division- and group-wide implementations of for example a manufacturing execution system and e-commerce platforms.

Although the subsidiaries’ management teams and Division management were in agreement that many of their outdated systems needed to be replaced to generate a solid digital backbone, they all had great respect for this large-scale ERP implementation - not only because they had all seen such programs fail miserably elsewhere in the industry but also because of the boundary-spanning character of the program. With both the scale (i.e., number of organizational functions and subsidiaries involved) and scope (i.e., number of processes standardized) of the program being large, the subsidiaries were reticent about the prospect of a global SAP solution achieving standardization and harmonization because they already anticipated that striving for the best boundary-spanning solution would encompass tough decisions and some concessions and even a loss of flexibility in doing business.

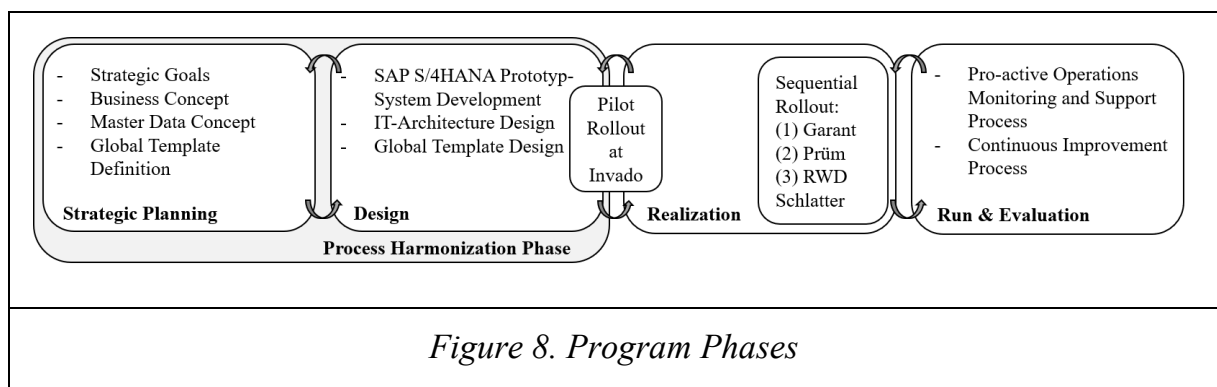
When looking at functional processes, global representatives of procurement, material management, production, sales, logistics, and finance management showed divergent design and performance goals when compared to their counterparts on a local level (i.e., other subsidiaries) and when compared to the Division’s aim of global harmonization and standardization to ensure the comparability of information and realization of synergies. As a senior manager of one subsidiary put it: “I totally agree that our systems need renewal to stay competitive in our market but I don’t see how we should strive for global harmonization in for example contribution margin accounting, when we mainly follow

the manufacturing logic of engineer-to-order and others mainly follow make-to-order or make-to-stock. Doing the right things for markets and customers.”

Furthermore, some representatives of the subsidiaries started to suggest specifications to maximize adjustments of the ERP system in their favor while the di-vision representatives promoted maximal standardization and their intent to implement a more or less “one-size-fits-all” solution for each manufacturing logic.

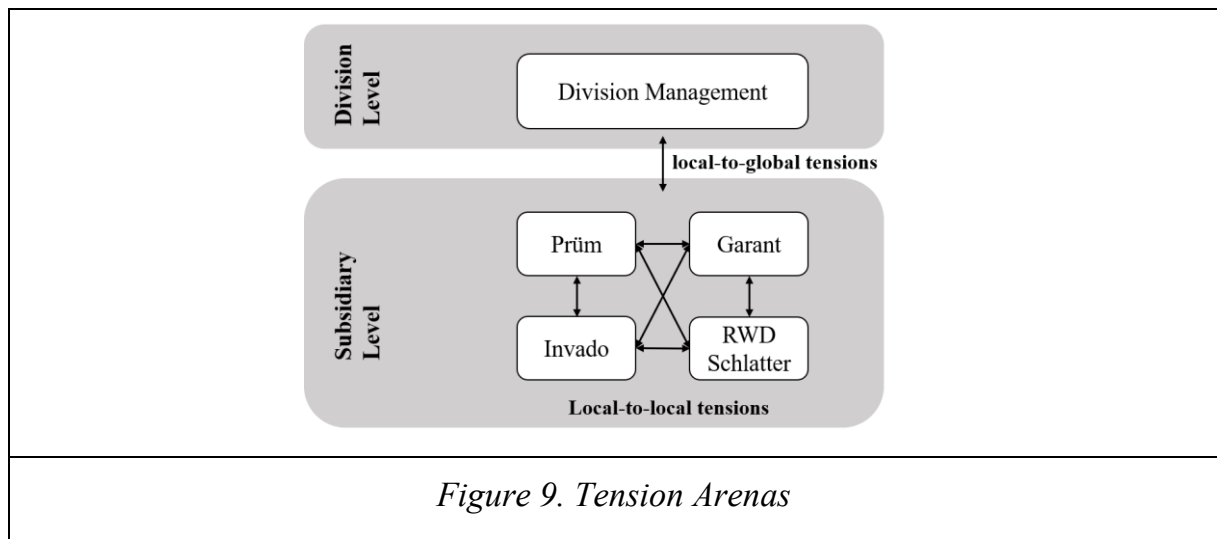
One senior manager of the Division’s management explained the challenge for the ERP program as follows: “The implementation demands a mind shift. From our - typically for decentralized structures - individualistic, subsidiary-centric way of doing things to a more joint, division-wide perspective on what we are doing together and what separately and how we are doing it. To under-stand the balance will be the key for future profitable growth.”

As they were commencing the process harmonization phase (Figure 8 shows the program phases with their corresponding activities), which is set to be finished by the end of 2020 with a defined global template, both the program manager (the Division’s CIO) and the program sponsors (Division Head and Group CEO and Group CFO) were well aware of the above-mentioned contrasting intentions and demands and started to frame and manage them as tensions.



The transformation from four local ERP systems to one global ERP solution will give rise to various tensions between stakeholders within the program: for example, between the functional business units (i.e., finance, material management, production, logistics, and sales), between business and IT, between the subsidiaries (i.e., local-to-local), and between the subsidiaries and the Division (i.e., local-to-global). Due to the existing decentralized organizational structures, the program manager and the program sponsors reckoned that there should be an emphasis on proactively tackling the latter two tension

arenas to ensure successful program progression (Figure 9 shows the two tension arenas in focus).



According to existing theory (Jarzabkowski et al., 2013; Smith & Lewis, 2011), tensions are inherent to organized change as many competing, and often conflicting, demands come together. Tensions particularly become salient in change endeavors that imply a wide range of stakeholders and high complexity, such as ERP programs (Akkermans & van Helden, 2002; Mandal & Gunasekaran, 2003). In practice, tensions often have a predominantly negative connotation. They are seen as disruptive factors only bearing conflicts and risks and, thus, need to be removed by favoring one side over the other (i.e., either-or decisions). However, tension theory has also brought forward a different, more positive understanding of tensions. It posits tensions as a valuable source in finding the best solution to a complex endeavor. Properly understanding and addressing tensions can even help organizations to improve an endeavor's outcomes (Wong, 2005).

Against this backdrop, the program manager and program sponsors launched the first round of workshops with representatives of the four subsidiaries and the Division's management to distill the most central tensions between the subsidiaries (i.e., local-to-local tension arena) as well as between the subsidiaries and the Division (i.e., local-to-global tension arena) and pro-actively derive the corresponding program risks to get a better grasp of the challenges associated with the tensions (see Table 24).

Regarding Arbonia Doors' ERP program, the tensions identified are classified in terms of their arena (i.e., local-to-local and local-to-global) and their type. In the present program, *performing tensions* refer to the clash of contrasting goals and strategies of the subsidiaries and the Division, while *belonging tensions* refer to the program members'

contrasting identities and perspectives towards the program depending on their affiliation to the subsidiary or division level.

Apart from the two tensions over contrasting ERP implementation goals and contrasting process design requirements between subsidiaries, all other tensions can be located in the local-to-global arena.

During the workshops, it soon became clear that representatives of all subsidiaries were gatekeepers of their company's interests (e.g., regarding ERP implementation goals, process design requirements, or performance optimization), not only against their counterparts on the subsidiary level but also against the division-wide interests regarding most process and system changes by the division-level representatives.

After having identified the performing tensions, the workshop group derived the corresponding program risks. They concluded that these tensions would make it more difficult to set, align, and prioritize local and global goals as well as define appropriate standards and the right degree of harmonization.

Along with the performing tensions regarding goals and strategies, belonging tensions regarding the program members' identities and perspectives were identified in the local-to-global tension arena. A distinct understanding of belonging could be identified among the majority of actors on both the local and global level: either to a local program team (with predominant local ambition) or to a global program team (with predominant global ambition). Furthermore, the tension between the representation of subsidiary-specific interests and division-wide interests could be identified. This was connected to the risk of unclear roles and responsibilities of actors within the program and a possible fall back from a boundary-spanning program structure to a classic program structure, reinforcing the traditional decentralized organizational structures from daily business. This would be inappropriate from both the global ERP systems' perspective as well as the boundary-spanning project process' perspective.

Other derived risks were the uncertainty regarding roles and responsibilities among program members, lack of trust and mutual understanding, a rise of hidden agendas and unclear communication of intentions and goals, misunderstandings between program members, decreasing project efficiency and speed, lack of sense of need for joint change efforts, lack of readiness to compromise, missing boundary-spanning perspective, lack of commitment and motivation towards the program, and lack of sense of community across the whole program team.

<i>Table 25. Identified Tensions and Program Risks</i>			
Identified Tensions			Identified Program Risks
Arena	Type	Subject	
Local-to-local	Performing	ERP implementation goals of subsidiary X vs. ERP implementation goals of subsidiary Y	- Difficulty in setting and prioritizing local and global goals - Difficulty in aligning local goals and local and global goals - Difficulty in defining appropriate standards and achieving the right degree of harmonization - Bypassing of program structures and falling back into behavioral patterns used in the daily business context - Unclear roles and responsibilities - Lack of trust and mutual understanding - Rise of hidden agendas and unclear communication - Lack of readiness to compromise - Missing boundary-spanning perspective - Misunderstandings between program members - Decreasing project efficiency and speed - Lack of sense of need for joint change efforts - Lack of commitment toward the program - Lack of sense of community across the whole program team - Difficulties of seeing business changes as chance
		Specific process design requirements of subsidiary X vs. specific process design requirements of subsidiary Y	
Local-to-global	Performing	Subsidiary-specific performance optimization vs. division-wide optimization of performance	
		Maximal subsidiary-specific ERP system adjustments vs. maximal division-wide standardization of ERP system	
		Subsidiary-specific design of processes vs. division-wide harmonization of processes	
	Belonging	Representation of subsidiary-specific interests vs. representation of division-wide interests	
		Being part of a local program team vs. being part of a global program team	

In sum, thanks to the workshops, many tensions could be identified and the corresponding challenges better understood in terms of program risks. As a consequence, the program manager and sponsors and their team were not only aware of the tensions and corresponding challenges but also keen to find an appropriate way to tackle these tensions. Despite the prevalence of ERP programs that could serve as a learning ground, they could not fall back on comprehensive, off-the-shelf guidance from practice or literature. Hence, they decided to develop their own solution.

E.3 Action Taken

With an understanding of governance as a means of control and coordination to establish order and deal with competing demands within a program, the program manager and program sponsors decided that the identified tensions should be tackled through a set of appropriate governance measures.

The design of these measures was then based on a positive tension understanding, suggesting that to find the best solution, tensions should not be addressed by favoring one side over the other but by striving for the alignment of both sides (i.e., both-and decisions) (Smith and Lewis 2011) (see section 2). Hence, Arbonia Doors set out to design governance measures for its ERP program that enabled both local differentiation and global consistency.

The intention was to start as early as possible with the design and implementation of governance measures because goal and strategy alignment is a particularly important early milestone in an ERP program, and a program conducive sense of belonging among the whole program team is a prerequisite for its progress.

Finding a way to align and enable local differentiation of the Division's subsidiaries to progress with the program and global consistency of the Division regarding how and to which extent this progress can take place became a top priority in setting up the governance framework in the strategy phase and building a solid base for the subsequent program iterations.

Therefore, both the program sponsors and the program management took on the task of establishing appropriate governance for the ERP program during the on-going strategy phase. The aim was to iteratively develop “glocal” governance - enabling both local differentiation and global consistency - by activating formal and informal governance mechanisms. Formal mechanisms are formal structures and processes that are documented and apparent, while informal mechanisms are not documented and are less visible.

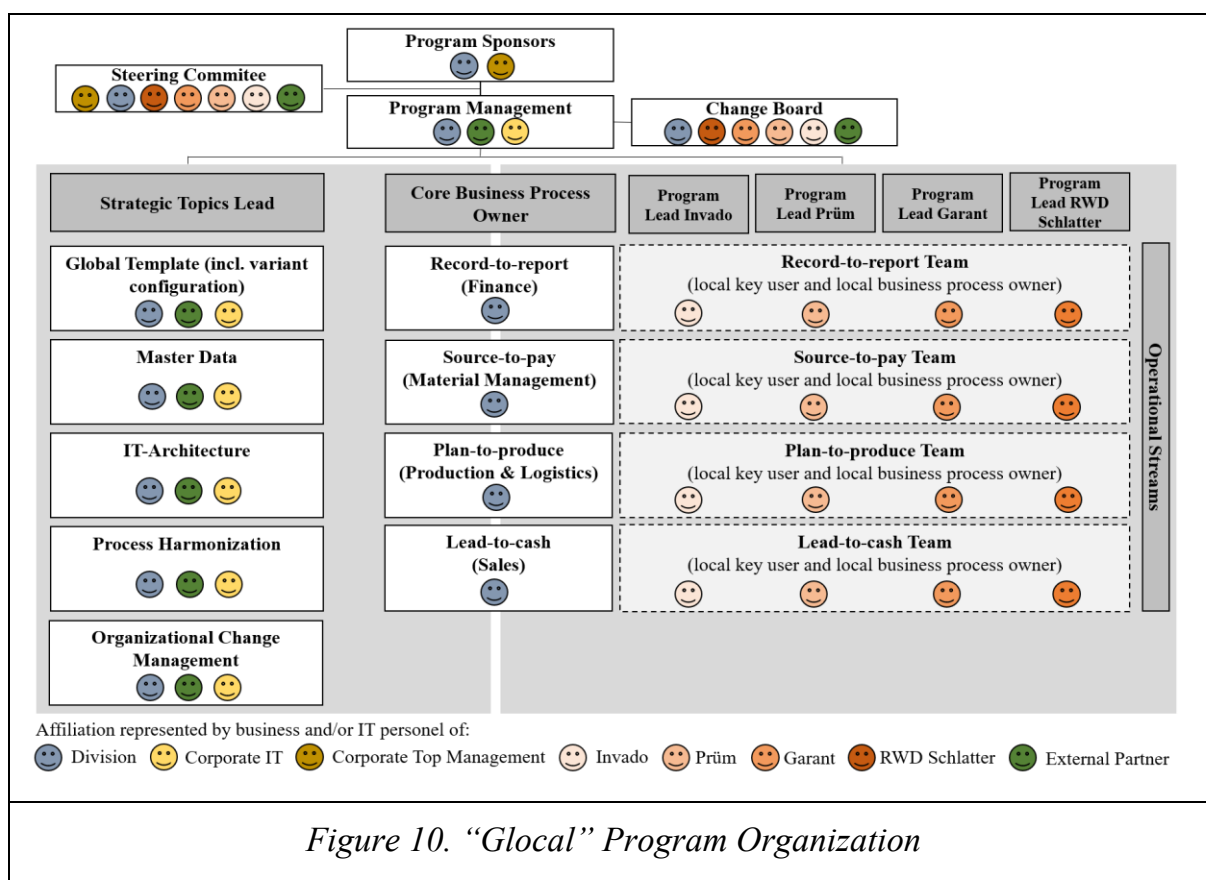
Table 25 summarizes the governance measures that were established and the corresponding, activated formal and informal governance mechanisms. The measures were designed during the 18-month-long process harmonization phase.

<i>Table 26. Governance Measures and Governance Mechanisms Activated</i>		
	Governance mechanisms	Governance measures
Formal	Program structure	- Set up of “glocal” program organization with mixed teams - Role profiles with shared responsibility and similar decision rights between the representatives of the subsidiaries and the Division - Composition of steering committee and change board with senior management members of each subsidiary and the Division - Definition of a global budget and local backfilling processes
	Role allocation & responsibilities	
	Decision rights	
	Resource allocation	
Informal	Trust	- Joint development of a target vision map (incl. ambition and mission) overarching division-wide goals and subsidiary-specific goals - Joint goal specification within dedicated “glocal” process teams - Joint identification and further development of key topics within dedicated “glocal” teams - Development of program ambassadors coming from subsidiaries and the division level - Regular program community-building meetings organized according to processes or roles to exchange experiences
	Common ground & shared understanding	
	Joint commitment	
	Participation	

Through the first goal definition and alignment iteration of the ERP program, key topics (e.g., variant configurator) and processes that were rife with competing demands, such as contribution margin accounting, could be identified. This then led to the setup of a “glocal” program organization with shared responsibilities and mixed teams consisting of representatives of the different subsidiaries and the Division. Figure 10 illustrates the “glocal” program organization with the corresponding mixed teams enabling both local differentiation and global consistency.

The program is structured according to the core business process streams and the implementation programs at each subsidiary led by a local IT and a local business representative. While the program sponsor, program management, and strategic topics lead were retained in the hand of division representatives and external partners, ownership of core business processes was shared primarily by a team of division and subsidiary representatives. Moreover, the installed change board consisted of representatives of both levels to ensure “glocal” decision-making. Key roles for integrating not only different functions (e.g., finance, sales, etc.) but also harmonizing the division-wide processes are the

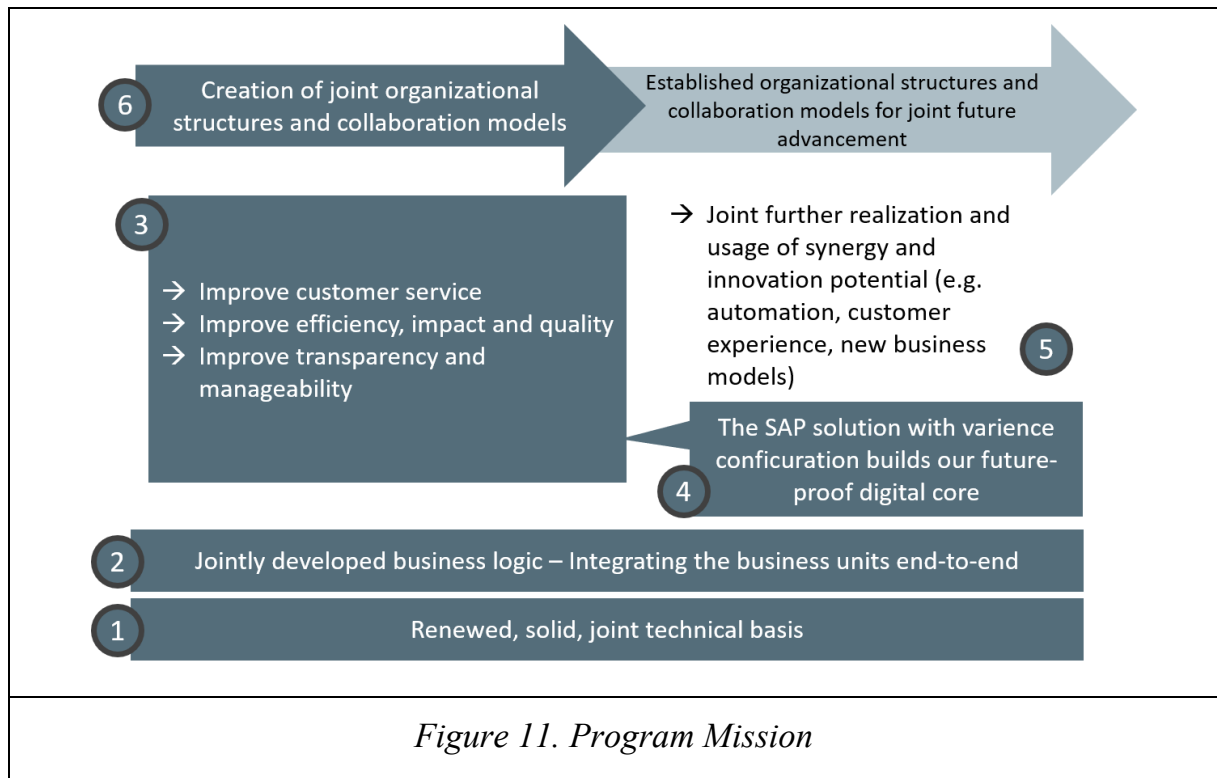
global core business process owner, local business process owner, global master key user, and local key users that were consciously assigned to representatives of both subsidiary and division levels and formally specified by role profiles.

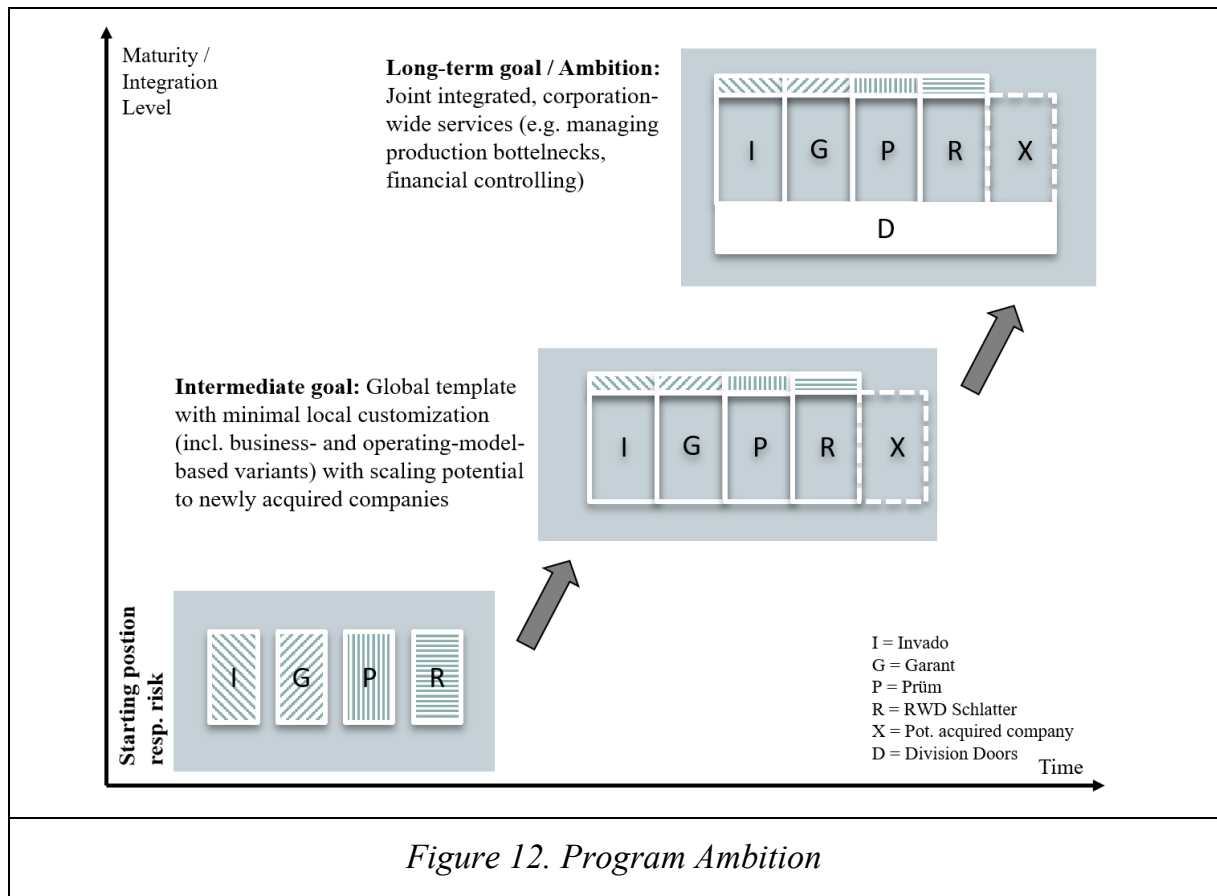


The "glocal" teams were installed to foster and eventually institutionalize collaboration between the subsidiaries and between the subsidiaries and the Division.

Another governance measure was the joint development of a target vision mapping overarching division-wide goals and subsidiary-specific goals. The vision mapping included the program mission and ambition.

Despite the many doubts regarding how a global template would fit the subsidiaries and represent their specific local interests, the target vision map helped to find common ground, establishing a joint understanding and commitment from high-level goals to low-level objectives. As an illustrative example of high-level goals, Figure 11 shows the overall mission.





Another example is the program ambition regarding process harmonization (illustrated in Figure 12). Both the program mission and ambition were jointly developed and used as communication tools within the ERP program and also in the local-line organizations and the Division offices.

As soon as a joint commitment to the strategic “Fit for Standard” objective to implement lean and efficient processes understood by users and forming a solid ground for digital transformation had been solidified, the dedicated “glocal” teams started to break down the goals into sub-goals and operational goals.

During these activities, key topics such as variant configuration, production capacity planning, and governance of master data were also further developed through dedicated “glocal” teams.

In addition, to foster the joint commitment and a “glocal” image towards employees of the whole Division, another measure was taken: Besides the Division Head, CIO and Group CEO members of senior management of each subsidiary were selected as program ambassadors.

Another governance measure was to set up program community meetings that would eventually be institutionalized. The program management office, therefore, organized

informal (virtual) meetings where master key users, process owners, and core business process owners representing different processes and affiliations could come together and share their views, experiences, and ideas regarding, for example, the central themes within the global template.

Moreover, they also defined a global budget and local backfilling processes to ensure that there is no staff shortage, and “glocal” teams can be installed without local or global budget restraints.

The activation of both formal and informal governance mechanisms took place through a mix of authoritative and enabling styles of measure implementation. The setup of the program organization was at first clearly top-down enforced by the program manager and sponsors but later allowed for co-design with other program members. The subsidiaries were then asked to fill in the spots with the right people, for which the Division supported the subsidiaries with the above-mentioned backfilling process. Other measures, such as the joint development of a target vision map, were, from the beginning, taken in a rather enabling style, allowing interested program members to co-design not only the resulting vision but also the formal aspects and processes of realizing the measure.

E.4 Results achieved

The combined set of governance measures contributed to positive results that led to improvements on the program level and a solid basis for future digital transformation. As the program sponsor pointed out: “With our “glocal” governance approach, we set a solid basis to continuously collaboratively align global goals with local goals and find the perfect degree of harmonization needed to success-fully tackle the digital transformation.”

The alignment impact (i.e., the effectiveness) of the governance measures was evaluated through 12 single interviews with program members from the Division as well as from subsidiaries. The interviewees assume diverse roles ranging from program manager to local key user. Through the interviews, an ex-ante evaluation of the impact for future digital transformation was also conducted. The interviews took place in June 2020. Table 26 summarizes the results of the alignment impact evaluation.

In the following, the results achieved in the strategy phase of the ERP program and the impacts on future digital transformation are outlined.

Observed alignment impact: Overall, Arbonia Doors' objective to find ways to align both sides of the identified tensions and enable local differentiation and global consistency could be achieved. In sum, especially structural measures and joint activities were observed of having a broad and - at least regarding some tensions - even a high impact on alignment.

The formal mechanism of setting up a “glocal” program organization with corresponding decision-making rights and responsibilities clearly defined by role profiles gave the program members the initial orientation they needed. Although not yet in action, program members of the Division and subsidiaries could envision their integrational role and their corresponding responsibilities. After getting to know the idea of “glocal” structures with the close collaboration of division and subsidiary representatives according to the business processes, having a formal program organization in place helped the program members to understand the idea and the different teams and roles in relation to composition and responsibilities. As a representative of the Division pointed out: “The formal program organization and the clear role profiles helped me to understand the “glocal” approach and the information flows and the joint decision rights of Division and subsidiaries that come with it. A well-organized cascading communication needs to be set up.” Furthermore, the “glocal” structures helped to align the belonging tensions regarding interest representation and identification with the program. An appointed master key user of one subsidiary pointed out: “The formal pro-program structure and role profiles are important to understand your role on activity level and it also supports you in building your dual role as representative of your company and as contributor to the whole division-wide program.”

Table 27. Observed Alignment Impact of Governance Measures

		Tensions						
		ERP implementation goals of subsidiary X vs. ERP implementation goals of subsidiary Y	Specific process design requirements of subsidiary X vs. specific process design requirements of subsidiary Y	Subsidiary-specific performance optimization vs. division-wide optimization of performance	Maximal subsidiary-specific ERP system adjustments vs. maximal division-wide standardization of ERP	Subsidiary-specific design of processes vs. division-wide harmonization of processes	Representation of subsidiary-specific interests vs. representation of division-wide interests	Being part of a local program team vs. being part of a global program team
Observed impact:								
Governance Measures	Set up of “glocal” program organization with mixed teams							
	Role profiles with shared responsibility and decision rights between the representatives of the subsidiaries and the Division							
	Composition of steering committee and change board with senior management members of each subsidiary and the Division							
	Definition of a global budget and local backfilling processes							
	Joint development of a vision map with overarching division-wide and subsidiary-specific goals							
	Joint goal specification within dedicated “glocal” process teams							
	Joint identification and further development of key topics within “glocal” teams							
	Program ambassadors from subsidiary- and division-level							
	Regular program community building meetings organized according to processes or roles							

The setup of mixed teams fostered close collaboration between division and subsidiary representatives and helped, in a first step, to identify competing demands regarding the ERP system. It also allowed mediating between the program members' divergent expectations. In a second step, it allowed to set, align, and prioritize local and global goals and define straightforward harmonization candidates (e.g., procurement, controlling and accounting processes (except country-specific legal, fiscal regulations)), medium harmonization candidates (e.g., sales processes) and challenging harmonization candidates

(e.g., production and logistics processes). As one program member put it: “The initial rounds with the Division’s management and the local production companies to find the right ambition towards harmonization clearly revealed a lot of harmonization potential that we would not have seen on our own. The following joint activities within the mixed teams facilitated goal alignment tremendously - but clearly this did not come without compromises from both sides and tough discussions”. Topics encompassing such discussions were, for example, pricing (i.e., finding a consistent pricing or defining net or gross prices as calculation standard), streamlining product classification, calculating contribution margin, or credit limit checks.

The work in mixed teams also contributed to the framing of the contrasting interests between the subsidiaries and the Division as valuable to finding the best solution and optimizing business. Furthermore, dependencies and synergy potentials regarding local and global ERP processes and information as well as regarding the program progress could be identified.

The intensive collaboration in the strategic phase helped to establish an open communication culture where division and subsidiary representatives found a constructive way to develop and discuss their agenda critically. It also prevented misunderstandings (e.g., mutual understanding of similarities and differences in process flows).

Jointly establishing a global picture of the vision, goals, and mission of the program through iterations in “glocal” teams helped the team members of the different levels and companies build up the cross-boundary perspective needed to find commonalities and understand differences. Seeing one’s goals in relation to the others’ goals and the joint vision and collaborate closely with the (at least initially) perceived counterpart also contributed to dispelling fears. This led to reduced overall program resistance and made meeting halfway easier.

Moreover, the many collaborating activities and community-building measures activated the valuable informal governance mechanisms of trust, common ground, and joint understanding. This especially helped to align the program members’ dual perspectives on their roles and identities within the program. A senior management member of the Division said: “I am indeed surprised about our success in overcoming the traditional decentralized characterized structure of Arbonia Doors, where the majority focused on their business - especially in such a short time and in an ERP program that no one was really waiting for.”

These informal governance mechanisms helped build up a strong feeling of belonging to a “glocal” team where both subsidiary and division interests are represented by both management members and operative staff. This will allow for a rather lean, non-bureaucratic governance approach and move one step further from command and control to enablement and self-control within the teams in the next phase.

Besides all the positive results, there were also challenges in establishing “glocal” governance, of which some still persist. In the beginning, time pressure had been a big issue. There was insufficient time to thoroughly think through all governance measures. It had soon become clear that establishing solid governance enabling local differentiation and global consistency within the program would require more time. The program management and sponsors thus decided to take more time to allow for solid design, settling and evaluation of the governance measures in an iterative manner. The majority of people, especially those representing a subsidiary, had never been involved in division-wide programs and were not used to collaborating with other subsidiaries or the Division’s office and thus to boundary-spanning global thinking. Because such culturally influenced capabilities cannot be changed overnight, it is still an on-going process, even after the already passed 18 months of governance activities with a positive experience and continuous learning.

Another prominent challenge was the need for a distinct abstraction capability (i.e., abstracting from understanding and solving daily business problems towards a conceptual solution) in some roles. Without this capability, core business process owners, process owners, and master key users, in particular, are not able to find harmonization potential and define and prioritize global and local requirements. The program manager, therefore, started to systematically staff these roles with those from the subsidiaries and the Division’s office that bring along this capability. Furthermore, the settling and positioning of these integrating conceptual roles took more time than expected.

Another challenge has come up from the matrix program organization. For program management, this setup introduces more coordination effort and management complexity.

Impact on future digital transformation: The current experience with “glocal” governance within the ERP program serves Arbonia Doors as a valuable organizational basis for future digital transformation. In the meantime, Arbonia Doors, in particular, the Division’s management, now feels more confident that alternative organizational designs like boundary-spanning teams and collaboration, representing a more network-

style organization, will be possible in the future. This has also been claimed as a central antecedent of digital transformation (Majchrzak, Markus, & Wareham, 2016). As the program sponsor said: “I am convinced that the close collaboration between the Division and the subsidiaries within the program has given us all more confidence that we can tackle future digital transformation endeavors together. Although it is a way to go it has taken our reservation to division-wide collaboration and strategy alignment.” The ERP program and its “glocal” governance measures have triggered a change in awareness from separated local and global optimization to integrated “glocal” optimization. Managers as well as operational staff of the subsidiaries are now experiencing new roles that are not only focused on optimizing daily local business but also on changing the systems, processes, organization, and strategy in the best possible way from a mutually global and local perspective. This experience is considered valuable for Arbonia Doors’ upcoming programs aimed at implementing a manufacturing execution system and e-commerce platforms and also expected to contribute to the cultural change needed for successful digital transformation.

Altogether, the conscious and deliberate design and implementation of “tension-aware” resp. “glocal” governance in the early phases of the ERP program has brought Arbonia Doors, on both a division- and subsidiary-level, in a position of control and integrated manageability of a large-scale, global transformation preventing ad hoc moves or uncoordinated - even segregated - goal definition and realization.

With regard to the realization iterations soon to start, the ambition is to continuously develop and proactively adapt the governance to changing or upcoming tensions - hence, treating the governance framework not as static but rather as dynamic.

E.5 Lessons Learned

The iterative design of a set of governance measures to address the local differentiation/global consistency tension and the corresponding program risks has been accompanied by continuous reflection by the involved program manager, sub-program managers, program sponsors, steering committee members, functional managers, and executives of the line organizations. This reflection resulted in seven lessons learned that promise to be interesting for managers of other companies. While not claiming general projectability for all digital transformation programs because of the specific internal and external conditions of the case company, the generated lessons learned can serve as a consultable record for other large decentralized organizations, such as corporations, that are planning to upgrade or implement global information systems. They may not be aware

of the tensions and corresponding program risks and will eventually be seeking tension-aware governance measures and possible leverage to lay the foundation for successful ongoing digital transformation.

Lesson #1 – Continuously frame an ERP endeavor as a major step in the digital transformation journey rather than as a large, complex IT program: To stress the importance of a new approach towards governance, senior management of Arbonia Doors continuously and actively communicated the ERP endeavors' great potential to allow each subsidiary and the Division as a whole to take a major step in the digital transformation. This vision, which goes beyond the replacement of outdated ERP systems and laying the digital backbone for, for example, process automation and rather towards business and organizational transformation helped to build up a joint, division-wide understanding. From the program sponsors to the master key users and other program members, the understanding that not only division-wide process harmonization is needed but also new governance structures and processes to achieve the right degree of harmonization has been sustainably established. In this way - although requiring more effort regarding coordination, control, and collaboration - the program members can better appreciate that the new governance will pay off. They can enjoy the benefits of the program and the digital transformation as a whole. This leads to greater acceptance and motivation to engage in the program and assume an integrative, "glocal" role.

Lesson #2 – Actively strengthen the understanding and handling of tensions as a both-and rather than an either-or decision: While initially dealing with the idea of a global ERP, Arbonia Doors' senior management had soon realized that the decentralized organizational structures will evoke tensions within the program, potentially leading to reinforcement of the subsidiaries' boundaries. To avoid resulting black-and-white thinking and either-or decisions when it comes to program goals and system requirements, the program sponsors and manager actively framed the identified tensions positively and communicated among all involved parties that they were indeed a significant opportunity to find synergies and implement the best ERP solution for all rather than a barrier to program progress and success when addressed with a more balanced approach and both-and decisions. At the program outset, for instance, the Division Head claimed: "Our mission is to leverage contrasting local and global tensions to find the best possible solution."

Lesson #3 – Start early and allow developing governance measures by trial and error: The tight timeframe of the program's strategy phase forced the program sponsors and manager to quickly introduce governance measures to set up functioning governance.

This could only be realized in an agile approach that allowed iterations of design, implementation, and evaluation of measures. This helped to learn from real-life results and integrate the insights into the further development of governance measures. When first introducing the “glocal” governance organization, for instance, core business process owner teams were constituted of representatives of the Division and the subsidiaries. However, it soon became clear that “lower”-level teams (i.e., business process owners and master key users) also needed a “glocal” mix as soon as possible. Without a flexible, agile approach allowing trial and error and the continuous improvements of design elements, the program would be at risk of ineffective governance in the next pro-gram phases where other or additional tensions will probably arise.

Lesson #4 – Foster co-creation of governance: Enabling diverse program members of different levels to take part in the design, evaluation, and further development of the governance measures proved to be valuable to building confidence in the “glocal” governance approach and measures. Pushing governance in an authoritative manner onto the program would suppress program members’ confidence and engagement for effective lived governance. An important prerequisite for a functioning co-design of the governance measures was to build a strong commitment of the Division’s and the subsidiaries’ management to this mission. They were needed in addition to the program manager and sponsors to spread the idea and request dedicated program members to engage in the co-design.

Lesson #5 – Cover formal as well as informal governance mechanisms: Arbonia Doors’ ERP program clearly shows that activating formal governance mechanism, such as program structures, is not sufficient to ensure the intended behavior that allows local differentiation and global consistency. For instance, the formal organizational chart is not enough to ensure “glocal” behavior and collaboration. Because program members are used to the line organization structures, there is a risk of bypassing program structures and falling back into behavioral patterns used in the daily business context. At Arbonia Doors’ ERP pro-gram, the formal structures could only become an integral part of everyday pro-gram activity through measures such as community meetings, joint vision map-ping and goal alignment that activate informal governance mechanisms such as trust, joint commitment, common ground, and participation.

Lesson #6 – Develop a clear strategy on how to include external partners: ERP programs typically involve a large number of external partners, such as SAP consultants or external quality and risk managers. Arbonia Doors proactively sought to develop a strategy to integrate external partners into the “glocal” governance structures and processes.

Like internal staff, external partners were actively involved in the realization of all governance measures. The program management made sure that every external partner developed the same understanding of and approach towards the tensions between the Division and the subsidiaries. This allows preventing thwarting behavior of external partners and ensures that all involved parties act in concert.

Lesson #7 – Systematically demonstrate the effects of the governance measures: To demonstrate the value of the “glocal” governance approach, the ERP program’s management regularly reported on meetings where division and subsidiary representatives met. They sent newsletters (incl. pictures) to make boundary-spanning collaboration visible for not only other program members but also for regular staff of the line organizations. Thereby, they could demonstrate the progress of the joint program and joint process harmonization, and, in particular, joint collaboration successes. As Arbonia Door’s ERP program is very large and involves other significant alignment efforts, for instance, between business and IT and between functional units, local-to-local and local-to-global alignment is not a continual top priority for every program member. Thus, the continuous demonstration of positive effects of the governance measures on other alignment areas helped to generate a more integrated picture of the results achieved and future value potential of the developed governance approach.

Paper F – Designing Tension-Aware Program Governance: Learnings form an Action Design Research Study with Three Digital Transformation Programs

Table 28. Bibliographical Metadata Paper F

Title	Designing Tension-Aware Program Governance: Learnings form an Action Design Research Study with Three Digital Transformation Programs
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Abstract

Programs have evolved into popular instrument to realize enterprise-wide transformation yielding both local and global change benefits. Despite the balance of local change differentiation and global change consistency in programs is being recognized as lever to achieve mutual benefits, governance knowledge and practice still seem to heavily rely on an unitarist and top-down approach. Guided by tension theory and based on an action design research project with three digital transformation programs six design principles for a tension-aware program governance were developed. These design principles allow balancing competing local and global demands regarding goals as well as organizing and collaboration and thus enable effective governance in tension-prone settings.

Keywords

Action Design Research, Design Principles, Digital Transformation, Duality, Program Governance, Tensions

F.1 Introduction

Programs have become increasingly popular to realize enterprise-wide, strategic change in organizations (Pellegrinelli, 2011; Shao et al., 2012). Currently, the rapid and continuous development of digital technologies (Bajer, 2017; Legner et al., 2017) especially drives many traditional organizations to set up enterprise-wide transformation programs in order to remain competitive in the future (Chanias et al., 2019; Ross et al., 2019). While the relevance of programs for enterprise-wide transformation has been recognized (Martinsuo & Hoverfält, 2018), research and practice have also shown that programs are neither easy to realize nor always effective. On the contrary, many organizations fail in bringing programs to successful closure and realizing their aspired benefits (Shao et al., 2012). Considering the strategic weight, the vast budgets and manpower involved in the cost of failure can be very high for organizations (Kolf & Kerkmann, 2018). This is why program governance has been moving more and more into the focus.

Governance can be understood as the means to ensure the advancement of joint objectives through direction, coordination, and control within organizations, whether temporary or permanent (Crawford et al., 2008; Imperial, 2005). In contrast to projects, programs tend to be less specific regarding their outcome from the outset (Pellegrinelli, 2011; Turner & Müller, 2003). Programs are deliberately set up to ensure realizing both local and global benefits within organizations, which would not be possible to achieve through stand-alone projects (Lycett et al., 2004; Turner & Müller, 2003). Existing literature has shown that this dual-benefits imperative requires both local change differentiation and global change consistency within enterprise-wide programs, such as digital transformation programs (DTP) (Ross et al., 2019). Only focusing on global change consistency to ensure global benefits can impede local differentiation and thus benefits realization for local organizational units. At the same time, emphasizing local differentiation of change to maximize local benefits may erase global change consistency and thus the global value potential of the introduced solutions and changes (Ross et al., 2019). The challenge for governance therefore concerns finding an appropriate balance between the opposing local and global interests underlying the tension between local differentiation and global consistency (Weill & Ross, 2004).

This balance, according to organizational science scholars, is also crucial to achieve long-term change success (Gaim & Wåhlin, 2016; Lewis, Andriopoulos, & Smith, 2014; Martin, 2007). Through a balancing, responsive approach towards tensions, associated challenges can be prevented, and the tensions can even serve as a lever to achieve a better outcome (Smith & Lewis, 2011). However, this is especially difficult for large,

enterprise-wide programs in traditional organizations, where there is not only a plurality of stakeholders (Boonstra et al., 2017; Gregory et al., 2015; Thiry, 2002) but also a decentralized organizational structure with high local autonomy. In this context, the different local (i.e., heads of local business or IT units) and global stakeholders (i.e., corporate management), that typically—at least partly—become actors of the program are not used to considering the global respectively local consequences of their demands (Ross et al., 2019).

In sum, the organizational reality of the program's context in a traditional organization is in stark contrast with the boundary-spanning character and mutually beneficial ambition of a program. This makes balancing governance approaches especially challenging. Although aligning local and global demands is, in essence, what governance is about and how this can be done has been thoroughly studied in various domains ranging from information systems to project management research, it seems that the existing research and practitioner literature on program governance still relies on old-school concepts, such as top-down approaches and deterministic logics (Boonstra et al., 2017), emphasizing clear cut either-or decisions and black-and-white thinking, which are hardly suitable for the needed complementary and balancing approach towards tension that allows one to overcome program management challenges (Farjoun, 2010). It can thus be claimed that program governance needs to be re-thought and re-designed in order to not only prevent tension challenges, such as collaboration problems or goal conflicts (Engeström & Sannino, 2011), but also to leverage local and global interests. Nevertheless, there is hardly any guidance for the systematic design of program governance that enables both local change differentiation and global change consistency in an effective way. In line with Simons (1995) and Wareham et al. (2014), this shortage is understood as a design problem, where specific governance interventions are expected to direct local/global tensions within programs “toward a sustainable equilibrium” (Wareham et al., 2014, p. 1196).

Hence, in the current time of considerable (digital) change, the lack of knowledge on tension-aware governance design is considered a substantial shortcoming for traditional organizations launching enterprise-wide transformation programs. Following the still valid calls for more actively designing governance in project management (Miller & Hobbs, 2005; Müller et al., 2016) and information systems research (Weill & Ross, 2004; Wiener et al., 2016), the as non-trivially recognized problem of establishing a governance that balances competing local and global demands (Wareham et al., 2014) within programs is tackled. Therefore, the following research question (RQ) is asked:

RQ: How should program governance be re-designed to effectively balance local change differentiation and global change consistency in tension-prone programs?

The results presented in this paper emerged from an action design research (ADR) project conducted by the author together with the teams of three DTP, each embedded in a different traditional organization over a period of 20 months. This paper highlights the process of designing, implementing, and evaluating three program governance interventions that are more efficient and effective than existing ones when it comes to balancing local change differentiation and global change consistency in a tension-prone setting. Based on the concurrent synthesis of three context-sensitive real-life interventions and insights from existing governance and tension theory, six design principles (DP) were developed. The systematic process of learning and theorizing allowed us to move from three specific success stories to a generic solution for tension-aware program governance. Besides beneficial outputs for the three case programs, this study contributes to both broader practice and research: Our results promise to offer valuable guidance for executives seeking to enhance their existing program governance structures and processes to better fit the pluralistic and contradictory reality of the change faced. Our research stems from and aims at extending existing knowledge on program governance and tensions in DTP through rich empirical insights and prescriptive knowledge on setting up tension-aware governance, which represents an original contribution. In addition, despite a few exceptions, there are hardly any studies based on ADR projects with more than one case organization. Thus, this article also offers valuable first-hand insights on how an ADR project with multiple case organizations can be conducted.

The paper is structured as follows. It starts with the research foundation, representing the initial analysis of the problem and solution space. Therein, the focus lies on existing literature on programs, DTP, program governance, and tensions. Then, the research methodology along the ADR stages and the three involved case programs are outlined. Thereafter, the development of our DP, including the corresponding meta-requirements (MR), and evaluation results are presented. The article closes with a discussion of the theoretical and practical contributions, an outline of the limitations, and suggestions for future research.

F.2 Research Foundation – Preliminary Analysis of the Problem and Solution Space

In design-oriented research, designing artifacts is about iteratively transforming an undesirable organizational problem state to a preferable solution state (Gregor & Hevner,

2013; Simon, 1996). Besides developing a deep understanding of the practical problem, existing research and theory are important elements in structuring the problem, identifying possible solutions, and guiding the act of designing (Pries-Heje, Baskerville, & Venable, 2008; Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011). This section comprises a preliminary analysis of program governance in tension-prone settings, tensions in enterprise-wide transformation programs, and the needed tension awareness.

F.2.1 Understanding Effective Program Governance in a Tension-Prone Setting as a Problem

In organizations, programs are typically set up as temporary organizational constructs consisting of a collection of local activities, which sometimes take the form of projects (Pellegrinelli, 2011; Shao & Müller, 2011). Their aim is to achieve not only local but also global (i.e., enterprise-wide) strategic benefits that could not have been reached through a combination of stand-alone activities or projects (Lycett et al., 2004; Pellegrinelli et al., 2015). While many different program types exist, especially the increasing number of DTP aimed at building up new solutions, processes, and capabilities that go beyond IT units and across functional boundaries (Barthel & Hess, 2020; Henriette, Feki, & Boughzala, 2015), have contributed to the increase of program prevalence. At present, many traditional organizations under pressure to stay competitive or to survive in the future have put digital transformation on their strategic agenda (Matt et al., 2016). As a consequence, budgets have been increased significantly (Chanias et al., 2019; Svahn et al., 2017), allowing these organizations to move from advancing via multiple local projects towards taking a grand step on the digital transformation journey via enterprise-wide transformation programs (Ross et al., 2019).

Although programs have emerged as a recognized instrument to realize strategic change and enterprise-wide benefit in practice and literature (Pellegrinelli et al., 2015), and their characteristics have been intensely studied (Pellegrinelli, 2011; Shao et al., 2012), there still seems to be a lack of knowledge on how they can be successfully realized (Shao et al., 2012). While program management has matured and professionalized in organizations over the last years (Martinsuo & Hoverfält, 2018) many organizations still struggle to realize the mutual local and global benefits of their enterprise-wide programs in a given organizational context and therefore ensure the necessary balance between local change differentiation and global change consistency within the program (Ross et al., 2019): Only focusing on global change consistency to ensure global benefits can impede local differentiation and thus benefits realization for local organizational units; at the

same time, emphasizing local differentiation of change to maximize local benefits may erase global change consistency and thus the global value potential of the introduced solutions and changes. With local/global alignment (Crawford et al., 2008) and context awareness (Kiselev et al., 2020; Pellegrinelli et al., 2015) being recognized a distinct program governance responsibilities, it is program governance we need to examine more closely.

Difficulties already emerge when trying to define program governance. In both academic and practitioner literature, a wide range of definitions abound offers room for different understandings and confusion (Cornforth & Brown, 2013). Although program governance lacks a common definition, there is some consensus in project literature that it is a framework which enables program management to deliver the aspired benefits of a program (Müller et al., 2016). Program governance entails measures of directing, coordination, and control through which joint objectives of stakeholders with diverse degrees of autonomy in their parent organizations are set (e.g., decision-making) and attained (e.g., monitoring) (Crawford et al., 2008; Imperial, 2005; Turner & Müller, 2003). In line with governance research in the IT and project management domain, effective governance is understood as a set of measures that ensure that the “right things are done” (i.e., effective program management in terms of achieving program goals) and that “things are done right” (i.e., efficient program management in terms of program processes and structures) (Jöhnk et al., 2019; Pemsel & Müller, 2012; Williams & Karahanna, 2013).

Against the background of the local change differentiation and global change consistency imperative, the challenge for governance is to find an appropriate balance between the opposing underlying local and global interests, referring to both program goals and the applied program processes and structures (Weill & Ross, 2004). Drawing on existing research, we try, as a first step, to sharpen our research scope and distill underlying tension dimensions where relevant conflicting local and global interests can be found. In the literature, a main tension (e.g., generativity vs. stability in technology ecosystems) is typically disassembled into various competing demands or opposing elements in different dimensions or levels (e.g., standard vs. variety of output; control vs. autonomy of actors; collective vs. individual identification) (Smith & Lewis, 2011; Wareham et al., 2014). Taking up this disassembly approach, four opposing elements could be identified via a preliminary literature research and structured along the dimensions of (1) program goals and (2) program organizing and collaboration.

Relating to program goals (i.e., technological and organizational goals), there are the tensions of system customization vs. standardization (Boonstra et al., 2017; Gregory et al., 2015; Rolland & Monteiro, 2002) and organizational differentiation vs. integration (Boonstra et al., 2017; Ross et al., 2019). Both tensions in this dimension are highly interrelated (Boonstra et al., 2017) and revolve around the question of what—in terms of outcome—should be achieved and how much system standardization and organizational integration is possible and how much system customization and organizational differentiation is needed to ensure both local change differentiation and global change consistency through the DTP.

The tension regarding program organizing refers to contrasting processes and structures in pursuit of the desired outcome (Smith & Lewis, 2011). The tension identified centers on the top-down vs. bottom-up approach (Boonstra et al., 2017; Gregory et al., 2015). This tension revolves around the question of how much autonomy should be granted to local execution units within the digitalization program while still ensuring a certain amount of central control. In terms of program collaboration, the identified tension is collective vs. individual identity (DeFillippi & Sydow, 2016; Smith & Lewis, 2011; Wareham et al., 2014). This tension revolves around the question of how the different program actors can simultaneously identify themselves as representatives of a global program and a local business or IT unit when working together.

It is expected that the outlined local/global tensions are especially pronounced in traditional organizations. Traditional organizations are characterized by so-called silo structures that have more or less deliberately been created and which guide operations for many years (Ross et al., 2019). In programs, several representatives of the different local (i.e., heads of local business or IT units) and global stakeholders (i.e., corporate management) become actors of the program. However, actors coming from this decentralized organizational context are respectively unaccustomed to considering the global and local consequences of their demands (Ross et al., 2019). Hence, ensuring collaboration, reducing conflicts, and finding a balance between global change consistency and local change differentiation becomes even more challenging.

Moreover, from a timing perspective, it is expected that the pre-implementation phase is especially critical in paving the way for program success: In this phase, the numerous different local and global actors with their conflicting interests come together, make commitments regarding program goals (i.e., what should be achieved) and processes (i.e., how the goals should be achieved) that need to be made, and the program is anchored within the parent organization (Miller & Hobbs, 2005).

Therefore, the focus of this ADR study lies on gaining empirical insights and working together with traditional organizations just launching their enterprise-wide DTP to develop a tension-aware governance solution that entails active responses to tensions balancing local change differentiation and global change consistency and offering great potential for effective program realization and long-term benefits for the organization (Jarzabkowski et al., 2013; Lewis, 2000).

F.2.2 Understanding Tension-Aware Program Governance as a Solution

Both practice and research show that there is a widespread lack of governance capability in contrast to management within programs (Winter et al., 2019). Furthermore, it seems that existing practical and academic knowledge on governance is stuck with a focus on local, small-scale projects wherein, for instance, clearly definable local solution implementations and local optimizations were the focal topics (Ross et al., 2019) and unitarist and deterministic logics (Boonstra et al., 2017), emphasizing that clear-cut either-or decisions and mechanistic steering processes were still adequate. In the above outlined pluralistic, ambiguous, contradicting reality of enterprise-wide programs, governance approaches are obsolete and thus call for a re-design (Pellegrinelli, 2011).

Following the argumentation that program governance should enable a balance between local and global demands regarding program goals, organizing, and collaboration, we are looking for a solution that enables simultaneously meeting competing demands. Hence, consulting tension theory to guide the solution design is valuable. Tension theory offers insights into how organizations can respond to tensions through balancing approaches rather than resolution efforts (Jarzabkowski et al., 2013; Smith & Lewis, 2011). Based on Jarzabkowski et al. (2013), active responses aimed at balancing competing demands are acceptance, confrontation, and transcendence.

Acceptance refers to identifying tensions and establishing willingness among actors to find a balance between competing demands (Lewis, 2000; Poole & Van de Ven, 1989). Confrontation refers to directly working through a tension's source through, for instance, discussions among actors (Lewis, 2000; Poole & Van de Ven, 1989). Finally, transcendence refers to reframing the relationship between competing interests from being contradictory to being complementary (Lewis, 2000; Poole & Van de Ven, 1989; Smith & Lewis, 2011). Existing research suggests a mix of active responses to balance tensions (Lüscher & Lewis, 2008; Smith & Lewis, 2011).

Undermining the initial findings of organizational studies, both IS and project management scholars have shown that finding an active approach towards tensions and seeking

a balance between opposing demands regarding change is a promising strategy (Boonstra et al., 2017; Gregory et al., 2015; Svahn et al., 2017; Wareham et al., 2014). However, with a few exceptions in domains such as platform ecosystems (Staub, 2021; Wareham et al., 2014), governance design has up until now mostly neglected to consult tension theory, and we know little about which governance measures can contribute to an active response.

Summarizing the preliminary analysis of the problem and solution space, the conceptual model of enhancing program governance in tension-prone settings is based on the idea that the program's context can lead to four local/global tensions challenging governance when trying to adhere to the imperative of local change differentiation and global change consistency. The arising tension challenges can be prevented or mitigated through tension-aware governance measures. Based on tension theory, tension awareness can be achieved through governance measures that allow active responses (i.e., acceptance, confrontation, and/or transcendence).

Analogous to the design of IT governance several years ago (Weill & Ross, 2004), enhancing program governance for enterprise-wide transformation is a new, urgent task for both practitioners and scholars, especially in the context of the current digital transformation pressure (Jöhnk et al., 2019). Hence, an ADR study is well suited at generating the needed guidance through iterative reflection and learning from theory and practice.

F.3 Methodology

The lack of practical and academic knowledge on how to enhance program governance for DTP in traditional organizations coupled with the promising opportunity to start a participatory research project in conjunction with three organizations led to the selection of ADR as our research method. With its potential to solve a real-life problem and its clear and rigorous methodical process, ADR appeals to both researchers and practitioners. ADR recognizes close and direct collaboration with practitioners as a valuable possibility to both learn and theorize from a specific intervention in an organizational context to improve existing solutions (Jöhnk et al., 2019). It allows for the development of ensemble artefacts, which are iteratively “shaped by the organizational context during development and use” (Sein et al., 2011, p. 37) and generate prescriptive knowledge via a continuous reflective process. To sum up, ADR is considered both a viable and valuable research method to systematically develop guidance to build up tension-aware governance for DTP in traditional organizations.

F.3.1 ADR Project and Case Programs

For successful ADR, collaboration between researchers and practitioners is essential. In 2019, the chance to start a joint ADR project with three large, multi-national companies facing the same challenge arose with the central question of how to set up a functioning program governance for their enterprise-wide DTP that balances local change differentiation and global change consistency to realize mutual local and global benefits.

The ADR project started in October 2019, and collaboration with the three companies lasted for 20 months in total. The ADR project partners (also referred to as case organizations or programs in the subsequent text) are a retail company (“RetailCo”) based in Germany and an insurance company (“InsuranceCo”) and a building supplier (“ManufacturingCo”), both based in Switzerland. We followed a separate and parallel collaboration approach, meaning that there was an ADR sub-project with each company following the same process from the start to the end. Because they were all under significant time pressure from the outset and wanted to enhance governance of their DTP as soon as possible, it was neither possible to follow a sequential approach (e.g., firstly with one company and then with another) nor desired to come together in mixed teams (e.g., for focus-group workshops). Nevertheless, the companies clearly wanted to be part of a tripartite ADR project and were interested in learning from one another and contributing to theoretical and practical knowledge creation.

The three case programs—ERP Transition, Merchandise System, and Omni-Channel Platform—share similarities but also show differences. The commonalities especially lie in their program characteristics. All three programs were initiated from the top management level and board of management as strategic top-down initiatives. They all sought to contribute to the corresponding parent company’s digital transformation through realizing specific technological and business changes within a timespan of six to seven years and a budget of 100 to 150 million U.S. dollars. All three cases engage a professional program management team. Regarding the DTP context, all case programs are embedded within large, traditional organizations with historically grown silo structures and high local autonomy.

Table 29. Case Programs

		ERP Transition @ManufacturingCo	Merchandise System @RetailCo	Omni-Channel Platform @InsuranceCo
<i>Parent Organization</i>	Industry	Manufacturing	Retail	Insurance
	# employees	< 10'000	> 100'000	< 10'000
	Organizational Form	Subsidiaries	Functional	Product-Based
	Autonomy of business units	High	High	High
	Autonomy of IT units	High	Low	Low
<i>Digital Transformation Program</i>	Aims	Improve customer service; Improve innovation capability; Increase efficiency and quality enable synergies	Accelerate demand realization; increase efficiency; reduce compliance risks	Improve experience at B2E, B2B, and B2C interface; Increase efficiency and integration capability; scalability of platform
	Aspired Changes	Technology: Implementation of standard ERP solution Business: harmonization; new collaboration model	Technology: Implementation of in-house merchandize system Business: renew business logic (end-to-end integration)	Technology: Implementation of interaction services Business: uniform digital and physical processes
	Local level actors	4 Subsidiaries / Production sites (company I, company II, company III, company IV each with its designated IT Unit)	5 Business Units (Procurement, Logistics, Sales, Finance & Controlling each with its designated IT support)	3 Business Units (Sales, Professional Pension, Non-Life Insurance each with its designated IT support)
	Global level actors	Corporate Management Shared Service Unit (incl. Corporate IT)	Company Management Company-wide IT	Company Management Company-wide IT
	Program Management Maturity	High	High	High
	Actors' Experience with DTP	Low	High	Medium
	Duration	~ 6 years	~ 7 years	~ 6 years
	Budget (in Million, USD)	~ 150	~ 150	~ 100

Their differences lie in their contextual nuances (see Table 1). First, the parent organizations' organizational structure differ. ManufacturingCo and InsuranceCo show a divisional structure, whereas RetailCo is a classic corporation. Involved in the DTP from a global level, there is the corporate center with its management responsible for typical corporate functions in finance, compliance, HR, strategy, and IT. From the local level, there are four highly autonomous subsidiaries (i.e., production companies) involved. The subsidiaries produce similar products for different geographical markets and are highly autonomous in doing both business and IT.

InsuranceCo is organized as a product-based matrix organization. From the local level of the company, the three business units of sales, professional pension, and non-life insurance are involved. Professional pension and non-life insurance units are particularly highly autonomous in doing business. The global level is represented by the company management and company-wide IT within the program. RetailCo, on the other hand, embodies a functional organization. Within the program, the global level is represented by company management and company-wide IT, and the local level is represented by the four business units of procurement, logistics, sales, finance, and controlling. A second difference lies in the stakeholder's experience. In RetailCo, local and global stakeholders already had experience with an enterprise-wide ERP program of a similar dimension, which had just failed. Hence, Merchandise System was the so-called successor program. In InsuranceCo, both local- and global-level stakeholders had gained some experience with smaller-scope DTP. In ManufacturingCo, the experience of all stakeholders with enterprise-wide DTP equaled zero. Thus, ERP transition is their first enterprise-wide DTP.

When we started our ADR project, all DTP were in the midst of their pre-implementation phase, which is claimed to be of high importance for laying the foundations for successful program performance (Miller & Hobbs, 2005). This phase is especially critical as various stakeholders come together with their different interests to not only grasp the DTP but also build up specific expectations and attitudes towards the outcome and process (Boonstra et al., 2017). In all three case programs, this shaping phase had already given rise to local vs. global tensions that needed to be adequately responded to.

The case programs are considered suitable in terms of lifecycle and the outlined degree of similarities and differences between the cases to generate DPs based on the situated design and implementation of tension-aware governance interventions within three real-life DTP and hence to learn and theorize from three different organizational contexts.

This inductive approach is common for ADR studies (Möller, Guggenberger, & Otto, 2020).

F.3.2 ADR Process and Data Collection

The ADR method differentiates four stages and contains seven principles (Sein et al., 2011). In the following, the four stages and corresponding principles are described. Figure 13 provides an overview of the research process, while Table 2 and 3 outline the applied methods in the problem formulation stage and the building, intervention, and evaluation (BIE) stage. In addition, the results section will offer further details on the refinement of our DP.

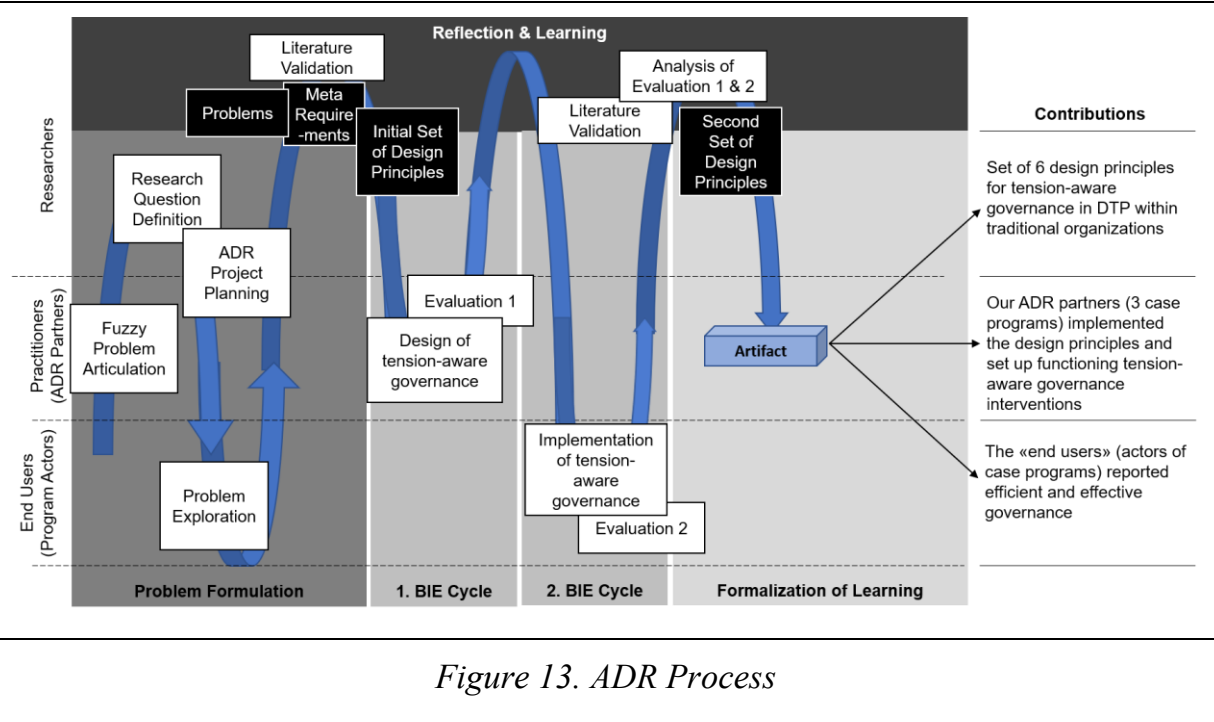


Figure 13. ADR Process

Problem Formulation

The starting point of our ASR project was a fuzzy set of problems independently articulated by representatives of the three case companies' respective programs at a practitioner workshop on the subject of DTP management and governance in 2019. In sum, they brought up that they found it challenging to bring together a wide range of actors from different highly autonomous backgrounds in the parent organization and find a balance between often contradicting global and local interests and mindsets. They were all at the outset of their DTP and looking for guidance in setting up a well-functioning governance. After having set up the ADR project with the case programs and agreeing upon the joint collaboration, the ADR study could begin.

Table 30. Problem Formulation and Reflection & Learning					
Input	Method				Output
	Triple Case Study				
		ERP Transition	Merchandise Sys-tem	Omni-Channel Platform	
Fuzzy set of problems articulated by case companies	Interviews	ADR Core Team*; Corporate Management Member; Head Corporate IT; Business Managers Subsidiary II-IV IT Managers Subsidiary I-III (9 Interviews, 60min each)	ADR Core Team; Head PMO; Head Company IT Head of Procurement; Head of Logistics Head of Sales; Head Controlling (9 Interviews; 60min each)	ADR Core Team; Head PMO; Head Company IT Head of Sales; Head of Pension Provision; Head of Non-Life Insurance (8 Interviews; 60min each)	9 common issues across cases
	Documents	Program Proposals; Corporate and Project Governance Guidelines; Organigrams			
Concurrent Reflection and Learning					
Case study outputs	Literature research and validation				7 Meta-requirements Initial Set of 6 design principles addressing practitioners needs and incorporating existing theory

As a first step in our research project, the focus centered on understanding the specific problems within the three case programs and relating them to a broader class of problems. To glean a deeper understanding on program governance in the case companies' respective programs, a triple case study was carried out. A case study approach is suitable to investigate a contemporary real-life phenomenon (Yin, 2009). Subsequently, the aim was to identify the specific practitioners' perspectives on program governance and what issues they have experienced or expect regarding the application of existing governance practice in the current DTP. By starting with this empirical focus, we complied

with the first ADR principle of “praxis-inspired research” (Sein et al., 2011). The triple case study included a total of 26 interviews lasting 60 minutes on average (i.e., nine representatives of ERP Transition @ ManufacturingCo, nine representatives of Merchandise System @ RetailCo, and 8 representatives of Omni-Channel Platform @ InsuranceCo). The interviewee sample consisted of representatives from different levels (i.e., local and global) and roles (e.g., business and IT) within the program and the parent organizations. To triangulate data, available program documents from each case was used. Based on the case studies, nine common issues the practitioners were facing across the cases could be identified. As our interest lies in exploring these problems, differentiation between the cases is considered indecisive at this point. After having identified the practical problems, they were matched with our preliminary literature research. This allows us to link the practical problems to a research gap and to inform the problem understanding through existing theory on governance and tensions (Hevner et al., 2004). The linkage of the practical problems to theoretical problem formulation and solution possibilities ensured our adherence to the second ADR principle of “theory-ingrained artefact” (Sein et al., 2011). Based on the findings of this stage, we formulated seven MR and an initial set of six DP through consulting the extant literature and theory in the concurrent reflection and learning stages (see Table 2 and the following sub-section “Reflection & Learning”).

Building, Intervention, and Evaluation (BIE)

The second stage of ADR consists of building, intervention, and evaluation activities. As the initially identified problems all clearly referred to organizational processes and structures, we aimed at the enhancement of existing program governance, which can be understood as the development of an innovative organizational intervention. Thus, we followed an organization-dominant BIE “where[in] the primary source of innovation is organizational intervention” (Sein et al., 2011, p. 42). We split the BIE stage into two cycles and started with the initial set of DP.

These DP were implemented by the three ADR partners to design a governance intervention for their respective DTP. In the first ADR cycle, the governance interventions were designed by the dedicated ADR core team (i.e., implementers) of each partner organization. In the second ADR cycle, the governance intervention designs were implemented (i.e., translated into governance interventions) in the respective DTP and used or experienced by the program actors (i.e., end users). Both cycles were directly followed by an evaluation.

Table 31. BIE and Reflection & Learning

Input	Method			Output
1. BIE Cycle				
7 meta-requirements; Initial set of 6 design principles	Workshop with each ADR partner			3 separate designs of tension-aware governance Design decisions/case
	ERP Transition	Merchandise System	Omni-Channel Platform	
	ADR Core Team* (3 participants; 6h)	ADR Core Team Head PMO (4 participants; 6h)	ADR Core Team Head PMO (4 participants; 6h)	
3 separate designs of tension-aware governance based on initial set of design principles; Design decisions/case	Semi-structured interviews			Feedback focusing on usability of design principles
	ADR Core Team	ADR Core Team Head PMO	ADR Core Team Head PMO	
2. BIE Cycle				
Implementation of respective tension-aware governance design within each case program	Semi-structured interviews			Feedback focusing on usefulness of design principles
	ERP Transition	Merchandise System	Omni-Channel Platform	
	ADR Core Team; Corporate Management Member; Head Corporate IT; Business Managers Subsidiary I-II IT Managers Subsidiary I-IV (10; 60min each)	ADR Core Team; Head PMO; Head Company IT Head of Procurement; Head of Logistics Head of Sales; Head Controlling (9; 60min each)	ADR Core Team; Head PMO; Head Company IT Head of Sales; Head of Pension Provision; Head of Non-Life (8; 60min each)	
Concurrent Reflection and Learning				
Feedback 1. and 2. BIE Cycle	Literature research and validation; Integration of learnings from literature and practice			Set of 6 refined design principles incorporating experience from implementers and program actors (i.e. end users)

The first evaluation was based on the conceptual design and the reported usability (i.e., ease of use) of the DP by the implementers and the second based on the implementation of the governance intervention and the reported usefulness (i.e., effect on balancing local change differentiation and global change consistency) of the end user of each ADR partner organization. This distinction between end users and implementers as the target group of DP has been claimed to be of high importance, as it is vital to developing guidance for implementers that consider a real practical impact (Gregor, Chandra Kruse, & Seidel, 2020; Seidel, Chandra Kruse, Szekely, Gau, & Stieger, 2018). Data for both evaluations was gathered through interviews with the involved implementers and end user of each ADR partner (see Table 3) and concurrently reflected via literature validation, which allowed for a diligent deliberation of the real-life application experience and feedback gathered. This enabled the improvement of the usability and usefulness of the DP. The deduced insights were used as a basis to refine our initial set of DP and (re)formulate them in a way that both implementers and users can understand (Gregor et al., 2020).

With this highly participative BIE process, we complied with the ADR principles of “mutually influential roles” and “reciprocal shaping” (Sein et al., 2011). Moreover, through direct evaluation of the design and the implementation, we also adhere to Sein et al. (2011) principle of “authentic and concurrent evaluation.”

Reflection and Learning

The reflection and learning stage was conducted in parallel to the problem formulation and BIE stages. It started at the end of the problem formulation stage with the reflection on the problems and possible solutions identified in both literature and practice, which resulted in the derivation of seven MR and an initial set of six DP. During the BIE stage, the concurrent reflection and learning on the design (1. BIE-Cycle) and implementation (2. BIE-Cycle) of the governance interventions within the three case programs was completed through integrating additional insights from literature and practice. This yielded learnings that allowed us to shift our DP from addressing three problem instances towards more generalizable design knowledge regarding a class of problems (i.e., tension-aware program governance) (Hevner et al., 2004). Involving three different case programs as active ADR program partners, in contrast to many other ADR studies that only collaborate with one practice partner, was especially valuable to reach this goal.

Adhering to Sein et al.’s (2011) principle of “guided-emergence,” after having defined the vision and preliminary design through an initial set of DP in the problem formulation

space, we allowed numerous adjustments based on reflection and learning during organizational intervention. The most substantial changes are directly reported in the results section.

Formalization of Learning

The fourth stage of the ADR process aimed to formalize the learnings (Sein et al., 2011). Based on our learnings made during our tripartite ADR project, not only a solution for three particular problems in their unique organizational contexts but also a more generic and abstract understanding of the problem and concept of the solution can be presented. Working with three companies strengthens this generalization. Thereby, we complied with the last ADR principle of producing a “generalized outcome” (Sein et al., 2011). The developed and refined DP are ready for use and valuable for both researchers and practitioners.

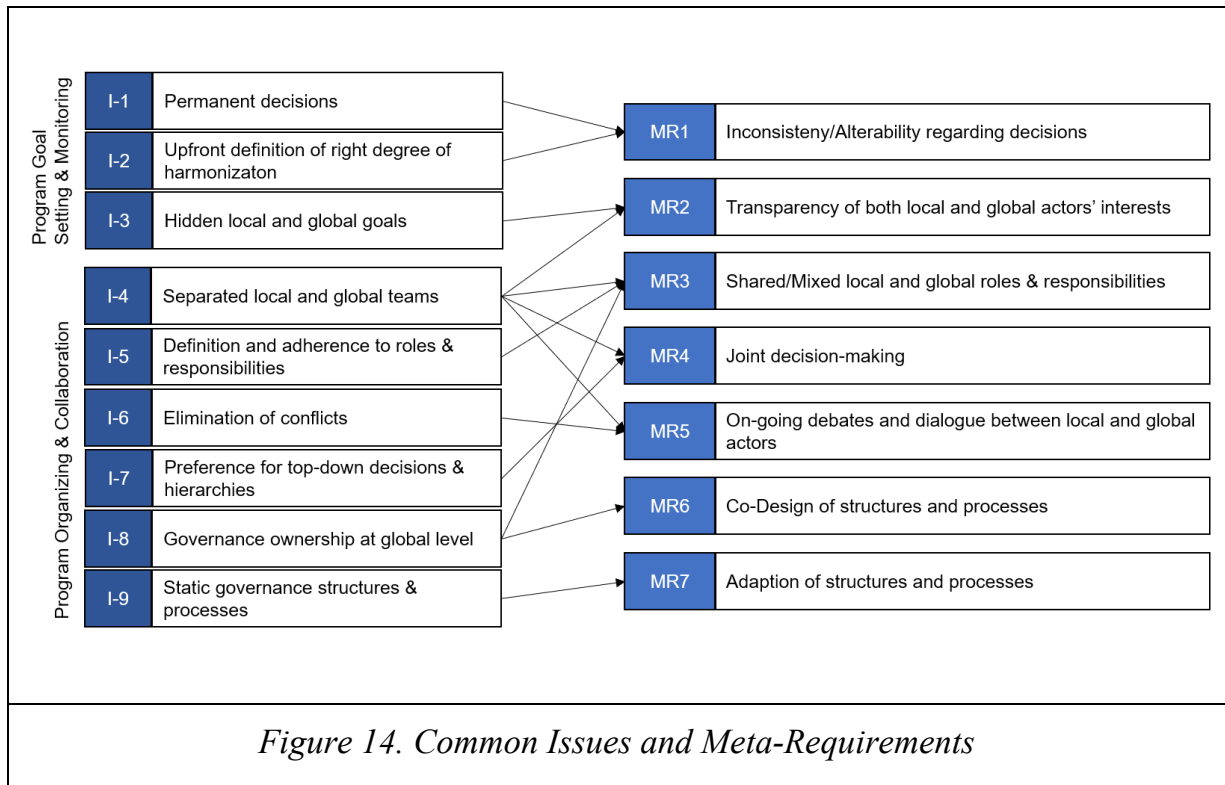
F.4 Results – Development of the Design Principles

This section presents the results from each ADR stage. The three cases yielded a massive load of data that cannot be reported fully within this paper due to space constraints. Hence, in the following section, the insights are reported in rather summative (i.e., focus across cases), rather than separate (i.e., focus within cases), manner. This reporting prioritization, however, should not lead to the conclusion that the data analysis was conducted superficially or in an a priori summative manner. Moreover, to leverage the generalization potential of learning and theorizing based on three specific organizational contexts, a deep understanding of the case programs and their specific context was required. To readers interested in more insights on what has been done in one case program (i.e., ERP Transition), Kiselev and Langenegger (2021) offer a detailed report.

F.4.1 Problem Definition: Meta-Requirements and Initial Set of Design Principles

Developing DP over the course of designing a solution to a problem is an underlying goal of ADR (Gregor & Hevner, 2013; Sein et al., 2011). To eventually ensure utility and validity of the DP, the first aim was to identify what governance issues the representatives of the case programs have experienced or expect to experience regarding the application of existing governance practice in the given tension-prone setting (i.e., associated with the local/global tensions regarding program goals as well as organizing and collaboration). Based on the triple case study, several expected program governance

issues could be identified for each case program. After analyzing the 26 interview transcripts, they were consolidated into nine common issues across the cases and seven MR for tension-aware governance with the help of existing literature (see Figure 14). This approach is suggested by Sein et al. (2011), as ADR should be both inspired by practice and ingrained by theory.



The derived MR represent a common understanding on what constitutes effective governance in tension-prone settings.

MR1: Effective tension-aware governance requires inconsistency/alterability regarding decisions.

The first two issues identified within the cases refer to goal setting and monitoring. Existing governance actors and bodies prefer making permanent decisions. As the Head PMO of Merchandise System @ RetailCo put it, “Our steering committees expects that what they decide is and remains fixed. They are not used and don’t like re-thinking and revising decisions.” Moreover, governance actors and bodies very much prioritize an upfront definition of the right degree of harmonization that the program needs to realize from a technical and business process perspective. This urging of rigid and deterministic decision-making is typical for managerial practice in general (Smith, Lewis, & Tushman, 2016) and within project settings (Miller & Hobbs, 2005). As put forward by

Smith et al. (2016), governing actors and bodies should refrain from strictly valuing consistency over inconsistency and rigidity over alterability of decisions. The corresponding black-white thinking is not rewarded, especially when two alternatives constituting a tension are interdependent. Hence, tension-aware governance should allow inconsistency and alterability regarding decisions and thus strategic flexibility (i.e., being able to adapt to emergent situations) (Miller & Hobbs, 2005). This is expected to allow transcendence as a response to tensions (Jarzabkowski et al., 2013).

MR2: Effective tension-aware governance requires transparency of both local and global actors' interests.

The two common issues, which together with the literature analysis yielded MR2, are: hidden local and global agendas and separated local and global teams. Both issues can be seen as interrelated.

As discovered through the case studies, existing governance fosters the replication of existing organizational structures within a program. With that, the adherence to separated local and global teams also in a change situation is emphasized, and local and global identities of actors remain separate. Together with the clash of local and global goals, this can give rise to hidden local and global agendas and untransparent communication between local and global actors and teams. The program manager of Omni-Channel Platform @ InsuranceCo described these issues: “Our existing program governance structures rely on our corporate governance framework and organizational structures. Therefore, we tend to define separate local and global teams, and with this we provoke that the teams are pursuing their own agenda. And this agenda is often not shared because it is already clear to the local respectively global team that there will be a clash of interests.” In line with existing research (Lannon & Walsh, 2020; Porter-O'Grady, 2019), tension-aware governance requires more information about the local and global interests of both local and global actors and thus more transparency. This is a prerequisite to even being able to identify and then confront competing demands (Jarzabkowski et al., 2013).

MR3: Effective tension-aware governance requires shared/mixed local and global roles and responsibilities.

The third MR is based on four issues identified and the corresponding literature analysis. As previously mentioned, existing organizational structures of the parent organization are typically replicated, leading to separated local and global roles and responsibilities

fostering clear boundaries between local and global teams and thus hardly any collaboration. At the same time, existing governance frameworks in all case organizations follow a top-down approach and foster hierarchies. As also shown in existing research (Weill & Ross, 2004), the ownership of governance is then typically assigned at the global level (i.e., representatives of the corporate management or board). This leads to an overemphasis of authority on the global level and the risk that global change goals are a priori prioritized. As a local business manager of RetailCo noted, “Group-wide programs are typically set up from the corporate management center. The program structures are typically characterized by global strategy teams and local execution units. Within such a structure, local teams and their interests have a lower standing compared to global teams and their interests. This leads to local resentment.”

To overcome these issues regarding program organizing and collaboration, the empirical findings suggest a conscious set up of local and global roles, for which both actors of local and global levels can be appointed. This also allows the empowerment of global actors to assume local responsibility and local actors to assume global responsibility. This carries not only a potential for a balancing redistribution of power but also for more social interaction (Jarzabkowski et al., 2013) and boundary work (i.e., establishing local and global boundary spanning perspectives) (Henry, Rasche, & Möllering, 2020). Shared or so-called mixed local and global roles and responsibilities are expected to allow acceptance, confrontation, and transcendence (Lüscher & Lewis, 2008).

MR4: Effective tension-aware governance requires joint decision-making.

The two common issues, which together with the literature analysis yielded MR4, are: separated local and global teams and the preference for top-down decisions and hierarchies. The case studies show that these issues regarding existing governance can foster both a centralization of strategic decision-making on the global level and a clear separation of local and global decision-making. Nevertheless, local stakeholders can be affected by global decisions vice versa (Ross et al., 2019). In this context, a representative of the global level of Omni-Channel Platform InsuranceCo noted the following: “We make enterprise-wide decisions regarding, for example, standardization topics with the expectation that this will finally allow the never-ending debate to rest. But what we get with these decisions is a re-activation of debate and further rounds of discussions as local issues and consequences only then surface.” On the other hand, a representative of the local level of Merchandise System @ RetailCo said, “What we often lack is clear rules or principles [for] which topics require both local and global representatives to be involved in decision-making.” The findings within the cases and the extant literature

(Boonstra et al., 2017; Smith & Lewis, 2011; Weill & Ross, 2004), led to the conclusion that a joint decision-making process is an appropriate mean to balancing global and local goals. Joint decision-making values the interrelatedness of local and global choices and allows for joint preliminary debates and evaluation of the consequences (Boonstra et al., 2017; Smith & Lewis, 2011). Hence, it not only allows for finding the “right” balance but also establishing a feel for the symbiotic interrelation between local and global interests (Weill & Ross, 2004). Joint decision-making processes are expected to allow acceptance, confrontation, and transcendence as responses towards local/global tensions (Lüscher & Lewis, 2008).

MR5: Effective tension-aware governance requires ongoing debates and dialogue between local and global actors.

The fifth MR is based on the issue of elimination of conflicts and the preference for top-down approach and hierarchies. Both issues are related. The case studies revealed that existing governance frameworks typically want to impede the open unfolding of conflicts and separate local and global teams. The cases showed that existing program governance is formal and administrative rather than informal and participative. The program manager of ERP Transition @ ManufacturingCo noted, for instance: “Our governance framework is about achieving order within the program. It formally regulates how program structures and roles are set up but does not refer to concepts such as how to achieve trust or common ground.” With a lack of opportunity and space for local and global actors to participate and to discuss their interests, tension awareness cannot be promoted (Boonstra et al., 2017; Lannon & Walsh, 2020). As also suggested by Poole and Van de Ven (1989), Lewis (2000), and Jarzabkowski et al. (2013), ongoing debate and dialogue are prerequisites to acceptance and confrontation of tensions.

MR6: Effective tension-aware governance requires co-design of structures and processes.

As already outlined above, one issue of current governance practices is the ownership of governance. Governance structures and processes are typically set up by global-level actors. This leads to a risk of emphasizing global views and interests. Furthermore, it can lead to a one-sided governance implementation and a lack of credibility from a local actors’ perspective. Against this background, the program manager of Merchandise System @ RetailCo said, “The easiest thing would be to implement the existing governance framework. It has been used in other programs and somehow worked out. One of the key findings at the time was, however, that we had struggles with establishing local

actor's acceptance of it. We faced massive resistance that led to a lack of adherence to the governance framework and work-arounds." To overcome these issues and increase confidence in the balancing power of the governance framework, the existing literature suggests to strive for co-designing governance measures with a variety of affected actors (Miller & Hobbs, 2005; Weill & Ross, 2004) from the local and global level. While not directly—but rather indirectly—this collaborative governance design approach is expected to facilitate a strong local and global commitment towards active governance measures that eventually enable an active response to local/global tensions.

MR7: Effective tension-aware governance requires adaption of structures and processes.

Another common issue identified across the cases is static governance structures and processes. Typically, the establishment of governance is characterized through once-off shaping of structures and processes. Nevertheless, as shown in the literature as well, in programs particularly, not all actors and interests are known from the outset (Miller & Hobbs, 2005; Pellegrinelli et al., 2015). The established mix of governance measures should thus be adaptable to contextual and program changes (O'Leary & Williams, 2013; Turner & Keegan, 2001) and accompanied by a flexible design adoption mindset (Miterev, Jerbrant, & Feldmann, 2020). This is expected to allow a better fit to the evolving program actors, interests, and arising tensions.

The identified issues and corresponding MR were the starting point for the development of DP within our ADR project. While the first constitute the why and what needs to be done in order to enhance tension-aware governance, the latter primarily refers to how it should be done. Based on the triple case study findings, we identified an initial set of six DP to facilitate inconsistency/alterability regarding decisions, transparency of both local and global actors' interests, shared/mixed local and global roles and responsibilities, joint decision-making, ongoing debates and dialogue between local and global actors, the co-design of structures and processes, and the adaption of structures and processes which could be derived (see Table 31).

The DP are not only based on the insights into the specific organizational context and characteristics of each of the three programs; they are also based on existing knowledge. Their initial validity was thus checked through literature research. The formulation of the DP is based on Chandra, Seidel, and Gregor (2015) specifying the material property, the actions, and the boundary conditions.

Table 32. Initial Set of Design Principles

Initial Design Principles		Meta-Requirement	Literature Validation
DP1	Provide governance with collective choice arrangement capability, so local and global actors can jointly participate in goal setting and decision-making, given that the local and global goals and decisions are of mutual concern.	MR3, MR4	Weill and Ross (2004); Lüscher and Lewis (2008); Ostrom (2015); Hall and Bonanomi (2021)
DP2	Provide governance with workable certainty capability, so the local and global goals are temporally fixed, given that local and global actors need temporary stability.	MR1, MR2	Poole and Van de Ven (1989); Miller and Hobbs (2005); Smith et al. (2016)
DP3	Provide governance with formal interaction capability, so local and global actors can work together in fixed teams, given that local and global interests in a program topic or process are in conflict.	MR2, MR3, MR5	Poole and Van de Ven (1989); Lewis (2000); Jarzabkowski et al. (2013); Boonstra et al. (2017); Lannon and Walsh (2020)
DP4	Provide governance with permeable boundary capability, so information and resources from local and global level can cross boundaries, given that there are distinct local and global program teams.	MR2, MR3	Provan and Kenis (2008); Miterev et al. (2020); Henry et al. (2020)
DP5	Provide governance with transparent control and monitoring capability, so local and global actors can both comprehend current conflicting interests and the current weighting of interests, given that the provided information allows a conclusive assessment.	MR2	Jarzabkowski et al. (2013); Harmsen et al. (2009); Porter-O'Grady (2019); Lannon and Walsh (2020)
DP6	Provide governance with iterative, joint learning capability, so changing local and global interests are considered and continuously feed into on-going adjustment, given that there are dynamic changes within the program and its context.	MR1, MR6, MR7	Turner and Keegan (2001); Weill and Ross (2004); Miller and Hobbs (2005); O'Leary and Williams (2013); Miterev et al. (2020)

To recapitulate this section, the derived initial set of design principles is considered suitable to address the MR and thus the essence that allows governance to be effective (i.e., balance local change differentiation and global change consistency) in a tension-prone setting and that differentiates it from existing governance practice. All MR are addressed by at least one DP. While MR4, MR5, MR6, and MR7 are addressed by one, MR1 is addressed by two, MR2 addressed by four, and MR3 addressed by three DP.

At this point, full coverage of the DP for all possible tension-aware governance instantiations cannot be claimed. Therefore, the BIE cycles and subsequent evaluations were started with an open, learning mindset.

F.4.2 Building, Intervention, and Evaluation: Design Decisions and Evaluation Results

Based on the initial set of DP, in the first BIE cycle, a tension-aware governance intervention in conjunction with each ADR partner was designed. In a workshop with each ADR partner and a dedicated designer team, DP were translated into specific design decisions (i.e., governance interventions) suiting the particular program setting (see Table 32 and Table 33).

In each program, each DP could be translated into at least two specific governance interventions. This already gave us a first insight regarding the usability of the DP.

The design was directly followed by the first evaluation (i.e., pre-evaluation). This evaluation focused on (1) finding out whether the set of DP is considered complete and (2) capturing the usability (i.e., ease of use) of the DP. For this, the conceptual designs of the governance interventions served as the basis. The evaluation is based on semi-structured interviews conducted with the “implementers” of each case program. To capture usability, the interviewees were asked to assess the DP on a scale (i.e., 0 = very difficult to use, 1 = difficult to use, 2 = medium to use, 3 = easy to use, and 4 = very easy to use). Thereafter, the scores were added up into a summative score per corresponding DP (see Table 34).

With regards to the question of completeness, the semi-structured interviews conducted with representatives of each case program revealed that the implementers did not miss a DP or did not want to add an additional one to address the previously derived MR.

Table 33. Design Decisions per Case (DP1-DP3)

DP1: Collective choice arrangement capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Steering committee with 4 global and 4 local actors; Change board consisting of 2 global and 4 local representatives; Shared core business process ownership (3 process teams with local and global representatives in the lead); Clearly defined role profiles with shared responsibilities	Steering committee with 3 global and 5 local actors; Change board consisting of 2 global and 2 local representatives; Shared strategic topic lead (duo of 1 global and 1 local representative); Rules/Principles regarding topics that require both local and global actors to decide	Steering committee with 4 global and 3 local actors; Change board consisting of 2 global and 3 local representatives; Program management team consisting of local and global shared decision-making rights for specific topics identified
DP2: Workable certainty capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Temporary “glocal” vision; Joint specification of local and global goals; Committed joint objectives	Temporary “glocal” vision; Joint specification of local and global goals; Committed joint objectives	Temporary “glocal” vision; Joint specification of local and global goals; Committed joint objectives
DP3: Formal interaction capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Regular steering committee meetings; Regular change board meetings; Matrix organization with “glocal” teams	Regular steering committee meetings; Regular change board meetings; Regular harmonization meetings	Regular steering committee meetings; Regular change board meetings; Regular harmonization meetings

The results across the three cases show that DP2 and DP3 show the highest usability score, while DP6 shows the lowest. Implementers of all programs reported that they had difficulties in understanding what the scope of the DP is (i.e., in terms of who needs to be involved in the co-design and what needs to be done). Additionally, the translation of DP6 shows one noticeable variance between the cases: While the designers of the ERP Transition and Omni-Channel Platform just defined feedback and monitoring measures regarding governance, the designers of Merchandise Systems decided to forgo the latter and instead add stakeholder management as a much more operational intervention. Interestingly, designers of the ERP program reported overall lower usability across all DP. One possible reason for this might be that the parent organization’s local level is constituted by autonomous business and IT units and that the program actors

experience with DTP is lower than in the other programs. This first evaluation round led to the conclusion that, in the subsequent learning and reflection stage, DP6 needs an adjustment for better understandability and clarity in order to increase usability.

<i>Table 34. Design Decisions per Case (DP4-DP6)</i>		
DP4: Permeable boundary capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Definition of global budget and local backfilling process	Regular PI plannings; centralized staff planning for local and global teams	Definition of global budget and local backfilling process; Regular PI plannings; centralized staff planning for local and global teams
DP5: Transparent control and monitoring capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Visualization of progress along local/global program ambition; Reporting documents communicated to local and global teams	Monitoring team consisting of local and global representative; Reporting documents communicated to local and global teams; Risk management considering possible tension	Monitoring based on information gathered at regular participative workshop with local and global representatives; tension dashboard accessible by all team members
DP6: Iterative, joint learning capability		
<i>ERP Transition</i>	<i>Merchandise System</i>	<i>Omni-Channel Platform</i>
Feedback meetings open for all program members; PMO responsibility for regular reflection of governance practice; co-creation of governance interventions	Stakeholder management, Co-creation of governance interventions	Feedback meetings open for all program members; Co-creation of governance interventions

The second evaluation (i.e., post-implementation) focused on capturing the perceived usefulness (i.e., the balancing effect of tensions & effect on program governance effectiveness) by the end user of each ADR partner organization. The evaluation was conducted 12 months after the launch of the designed governance interventions within each case program. The key question to be answered was: Do the governance interventions contribute to the balance between local change differentiation and global change consistency? To capture usefulness, the interviewees were asked to assess each governance intervention on a scale (i.e., 0 = a very weak balancing effect, 1 = a weak balancing effect, 2 = a medium balancing effect, 3 = a strong balancing effect, and 4 = a very

strong balancing effect). Thereafter, the scores were added up into a summative score per corresponding DP (see Table 35).

<i>Table 35. Results of 1. Evaluation (Usability)</i>						
	DP1	DP2	DP3	DP4	DP5	DP6
ERP Program	2	3	3	3	2	2
Merchandise System	3	4	4	3	2	1
Omni-Channel Platform	3	4	4	3	2	2
<i>Resulting Total Score</i>	<i>2.6</i>	<i>3.6</i>	<i>3.6</i>	<i>3</i>	<i>2</i>	<i>1.6</i>

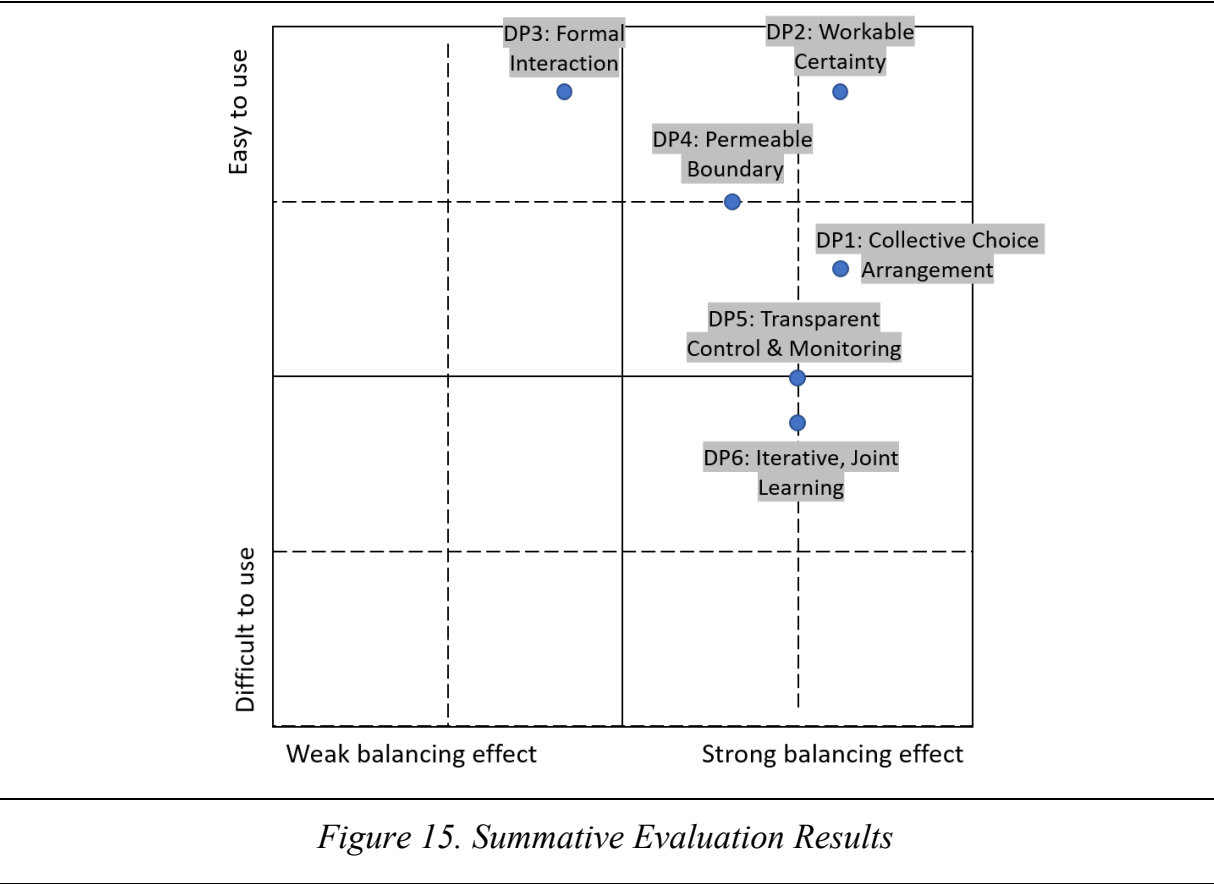
<i>Table 36. Results of 2. Evaluation (Usefulness)</i>						
	DP1	DP2	DP3	DP4	DP5	DP6
ERP Program	4	3	1	2	3	3
Merchandise System	3	4	2	3	2	3
Omni-Channel Platform	3	3	2	3	4	3
<i>Resulting Total Score</i>	<i>3.3</i>	<i>3.3</i>	<i>1.6</i>	<i>2.6</i>	<i>3</i>	<i>3</i>

DP1 DP2 were considered the most useful, and DP3 and DP4 were reported as less useful. DP3 especially was reported to be too one-sidedly focused on formal interaction capability, with responses highlighting that formal interaction should be complemented by informal interaction interventions. This was reported in particular by representatives of the ERP Transition. The majority of ERP transition interviewees reported in this context that, due to their lack of experience working together in a joint program, an important prerequisite to share respective local and global interests would be to establish trust. Interviewees from the other two programs also reported that they wished for more complementary informal interaction possibilities, such as community-building meetings organized along specific tension-prone topics.

This second evaluation round led to the conclusion that, in the subsequent learning and reflection stage, both DP3 and DP4 need an adjustment to increase usefulness.

The summative results of the two evaluations across all three case programs were plotted into a matrix with the two orthogonal dimensions: (1) usability (ease of use) and (2)

usefulness (balancing effect). This helps represent the overall relevance and practicability of each DP (see Figure 15).



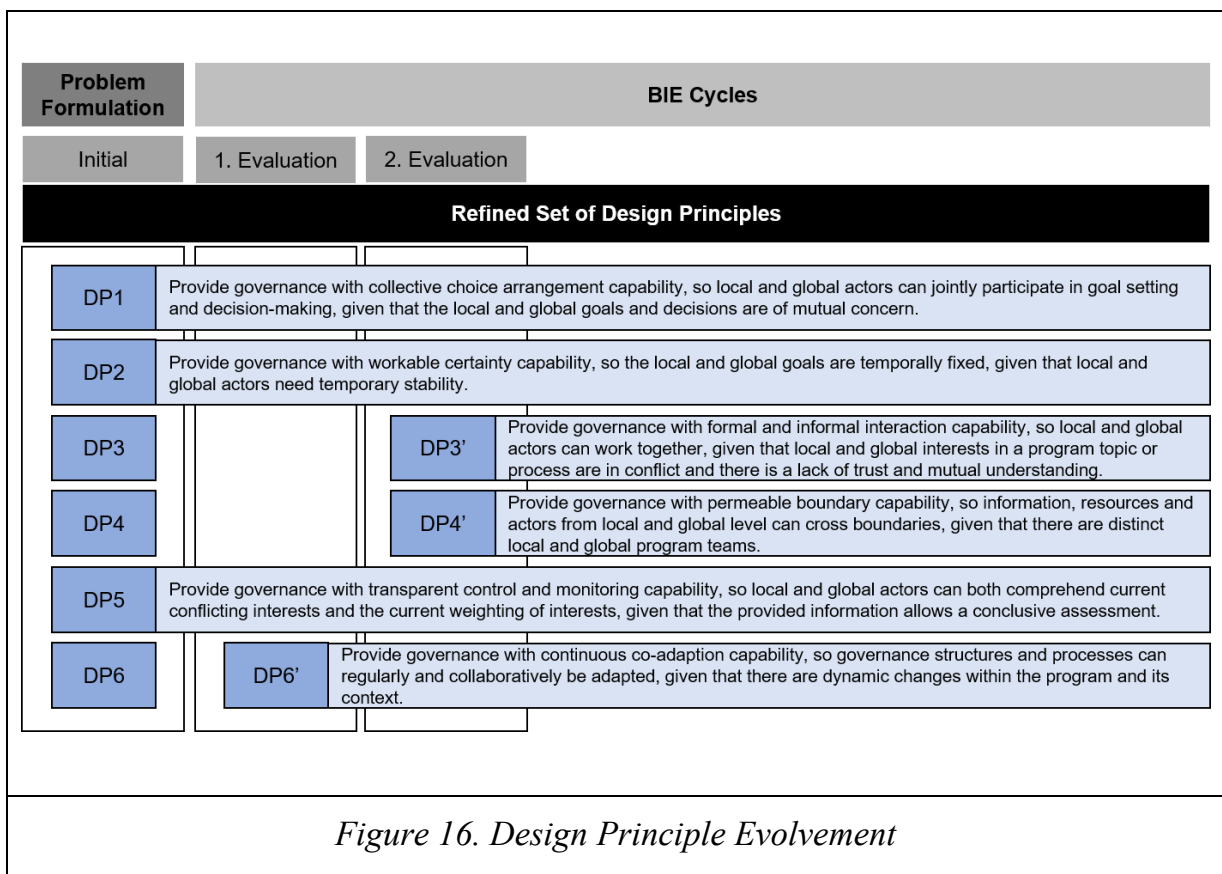
F.4.3 Reflection and Learning and Formalization of Learning: Refined Set of Design Principles

To contribute to the body of knowledge on governance of DTP in tension-prone organizational settings, we formalized the design knowledge gained during our ADR study in the form of DP. The refined set of six DP was derived from a learning and generalization process based on the building, intervention, and evaluation of a governance solution with three ADR partners (i.e., three parallel real-life interventions in three case programs). Figure 16 depicts the design principles' evolvement over the whole ADR process.

DP1: Collective choice arrangement capability

Shared responsibility between local and global actors and joint decision-making processes are valuable governance means for finding a balance regarding topics that are of mutual concern and, by extension, balancing local and global goals. Coming together in

governance bodies, such as steering committees or change boards, allows joint preliminary debates and evaluation of the local and global consequences of decisions (Boonstra et al., 2017; Smith & Lewis, 2011). It also helps create a feel for the symbiotic interrelation between local and global interests and establish joint commitment (Weill & Ross, 2004). Moreover, sharing responsibilities for mutually concerning topics between local and global actors allows for the establishment of a boundary-spanning perspective (Henry et al., 2020). As such, adhering to this DP fosters acceptance, confrontation, and transcendence as responses towards local/global tensions (Lüscher & Lewis, 2008).



DP2: Workable certainty capability

Striving for workable certainty means that local and global goals are temporally fixed. This allows a compromise between the existing governance's urge for permanent, up-front decisions and goal setting and needed alterability of goals in the long run (Smith et al., 2016) with the associated the risk of swinging between alternatives if there is no fixed target (Dodd & Favaro, 2007). Interventions such as designing a "glocal" vision and the joint definition of temporary local and global goals enable temporary balances and stability for the program.

DP3: Informal and formal interaction capability

Adhering to this DP allows local and global actors to come together and interact to jointly solve problems and work on issues that are in conflict. Interaction allows ongoing debate and dialogue, which are prerequisites to acceptance and confrontation of tensions (Jarzabkowski et al., 2013; Lewis, 2000; Poole & Van de Ven, 1989). Based on the evaluation result, formal interaction was complemented by informal interaction. This means that formally set-up teams and groups in which interaction between local and global actors take place should be supplemented by meetings or other possibilities that allow local and global actors to informally (i.e., spontaneously and voluntarily) come together. This is considered especially valuable if trust and mutual understanding still need to be built so that local and global actors are willing to openly share their interests and find a balance regarding their local and global identities (Boonstra et al., 2017).

DP4: Permeable boundary capability

Permeable boundary capability refers to the sharing of information, resources, and actors from the local and global level across distinct local and global teams. In certain situations, not all teams can and should boast a local/global mix of actors. This is why we added “actors” as an object to the initial DP. Permeable boundaries offer the opportunity to counteract the isolation of local and global teams and promote boundary-spanning information, resources, and actors if needed to find a balance between conflicting interests (Henry et al., 2020).

DP5: Transparent control and monitoring capability

Actors’ transparency regarding their respective local and global interests is a key prerequisite for tension awareness (Lannon & Walsh, 2020; Porter-O’Grady, 2019). On the other hand, being transparent about the current conflicting interests and the current weighting of interests towards all program actors is also vital to being able to continuously identify and then confront competing demands (Jarzabkowski et al., 2013). Hence, if information about the actual status of conflicting interests can be gathered and conclusively assessed, governance interventions, such as reports outlining tensions, should be realized.

DP6: Continuous co-adaption capability

Adherence to this DP allows continuous improvement of governance through joint learning and reflection. As not all interests are known from the outset (Miller & Hobbs, 2005; Pellegrinelli et al., 2015) and tensions evolve over time (Boonstra et al., 2017), static governance structures and processes should be avoided. The established mix of

governance measures should regularly be adapted to contextual and program changes (O’Leary & Williams, 2013; Turner & Keegan, 2001). Furthermore, both local- and global-level representatives should be involved in this adaption process. Co-design can increase program actors’ confidence in the effectiveness (i.e., balancing power) of the governance framework (Miller & Hobbs, 2005; Weill & Ross, 2004). This collaborative governance design approach facilitates building up the needed commitment of all affected actors towards active governance measures. With respect to the findings of the evaluation, this DP was reformulated to add clarity to what should be done.

F.5 Discussion

To answer the research question of how program governance should be re-designed to effectively balance local differentiation and global change consistency in tension-prone programs, six DP that incorporate practically and theoretically based requirements for the design of tension-aware governance (in terms of balancing effect) could be developed.

From a theoretical perspective, the contribution of this study can be seen as an improvement or, as Gregor and Hevner (2013, p. 353) put it, as “a nascent design theory to a well-known problem where existing theory has shortcomings.” In sum, the findings from both theory and practice were integrated to enhance governance for programs striving for both local change differentiation and global change consistency in tension-prone settings. ADR allowed us to conduct engaged and transformative research that demonstrates designing a tension-aware governance for DTP is a complex and context-sensitive endeavor requiring both problem solving and continuous reflection and learning. Therefore, our knowledge contribution is inherently of both a practical and theoretic character (Gregor & Hevner, 2013).

The first contribution arises from the initially derived set of MR. Although there is a lot of research on governance in the project management and IS domain, they offer little insight into how to improve governance in tension-prone settings (Gregory et al., 2015; Wareham et al., 2014). This study provides insights in the shortcomings of existing governance practice characterized by unitarist and deterministic logics (Boonstra et al., 2017), when it comes to finding an adequate response to tensions typical for the pluralistic, ambiguous, contradicting reality of enterprise-wide programs (Pellegrinelli, 2011). The derived MR provide a first suggestion of what tension-aware governance should incorporate in terms of processes—such as joint decision-making—and structures—such as shared roles and responsibilities by local and global actors.

The second contribution arises from the developed DP. Extant research has neglected governance design (Wareham et al., 2014). In line with other recent research in IS (Majchrzak et al., 2016) and project management (Miterev et al., 2020), our findings support the notion of further questioning traditional organizational design concepts and offer answers for how such concepts should be designed. Instead of viewing organizational design as a static, deterministic, and clearly bounded structural creation process, our study supports the still forming “new view of organizational design” (Majchrzak et al., 2016, p. 274) that values dynamics, emergence, and fluid boundaries. Moreover, this study might also be valuable for researchers interested in tension theory, as it provides insights into how the theory can be used as conceptual guidance for program governance. Based on thorough real-life evaluation, this study provides evidence regarding the DPs’ utility for governance designers and their usefulness for setting up a governance that balances local change differentiation and global change consistency within programs.

The third contribution relates to the methodology. Despite a few exceptions, there is hardly any scholarship based on ADR studies with more than one partner organization. Through the diligent description of the ADR process, this article also offers first-hand guidance to the design science community on how to conduct an ADR project with multiple partner organizations.

Finally, this study contributes to practice. Besides being valuable for the three case programs, the results are beneficial for executives seeking to implement a functioning program governance for their enterprise-wide DTP. The study at hand offers first-hand insights into how existing program governance practice can be improved in order to enable the conscious balancing of conflicting interests. It gives not only generalized, abstract guidance in the form of DP, but it also provides inspiration in how these DP can be translated through offering insights into the design decisions (i.e., governance interventions).

To ensure the quality of our ensemble artifact, especially the reflective design principles, we consequently adhered to the principles of ADR of Sein et al. (2011). Nevertheless, this study is not without limitations, which can be seen as areas of possible future research. Despite our work with three case programs, scientific generalizability and comprehensiveness of the DP cannot be claimed. Further research should investigate if the DP are also valid for a broader range of programs and if an addition of further DP is needed. Moreover, to strengthen the design theoretical value of the DP, more rigorous evaluation is necessary. As a result of the still nascent state of research in the field, a

rather exploratory approach was followed. This entailed the application of qualitative research methods from problem formulation to evaluation. Further research could apply quantitative methods to evaluate the effectiveness of the DP and verify the internal validity of the results. The research at hand can be seen as a first step towards the development of prescriptive knowledge on governance in DTP. The field is still wide open for further contributions. Therefore, more collaboration between research and practice to achieve both rigorous and relevant further knowledge is suggested.

F.6 Conclusion

In sum, the study can be seen as a pioneering step towards generating design knowledge for tension-aware program governance for DTP in tension-prone settings. The six developed DP allow for balancing local change differentiation and global change consistency of DTP. This study stimulates the generation of further descriptive, explanatory, and prescriptive knowledge on program governance and tension awareness in enterprise-wide programs or other related IS and project management domains. Especially in the dynamic and ever-changing digital age, finding suitable responses to conflicting interests—and thus increasing and continuously refining transformational capabilities—will be of lasting relevance for managers.

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