

Organizational project management methodologies

Structures, contents, and use

Jouko Vaskimo

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Abstract

This research investigates organizational project management methodologies – structured collections of project management knowledge and experience – by focusing on their structures and contents, and the specific reasons why organizations use them.

This research comprises a mixed-method multiple case study among ten organizations: Qualitative data are first collected from 57, and then quantitative data from 53 respondents.

The findings identify project management structure, cost and budget management system, time schedule management system, risk management system, and reporting, communications, and information system as the most important organizational project management methodology structures. Additionally, the findings recognize document templates, process descriptions and guidelines, role definitions and descriptions, project minimum and compliance requirements, and time schedule management materials and instructions as the most important organizational project management methodology contents. Further to these, the findings show that providing a common way of working, providing structure to projects, standardizing projects and providing consistency, providing a common project language and vocabulary, and enhancing quality of project management are the most important reasons why organizations use organizational project management methodologies.

These results highlight the similarities among organizational project management methodologies, however, also unique features and differences among organizational emphases on methodology structures and contents, and reasons why such methodologies are used can be identified from the findings.

The findings show that organizations use unique combinations of organizational project management methodology structures and contents to address the specific reasons why they use such methodologies. This suggests that there is no single best way to manage projects. The findings also suggest that the organizational project management methodology structures and contents, and the reasons why methodologies are used depend on project management challenges, which relate to organizational and project contexts. Furthermore, the findings suggest that organizations focus their organizational project management methodologies on the project management subject areas in which they find most room for improvement, and which they consider most likely to enhance chances of project success. Finally, the findings suggest that organizations adopt ideas for their organizational project management methodology structures and contents, and for reasons why such methodologies are used from public-domain and commercial project management methodologies, as well as from project management challenges related to organizational and project contexts.

Keywords organization, project management methodology, structure, content, use

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Organisaatioiden projektinhallintametodologiat: Rakenteet, sisällöt ja käyttö

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Tämä tutkimus tarkastelee organisaatioiden projektinhallintametodologioita – jäsenneltyjä kokoelmia projektinhallinnan tietoa ja kokemusta – keskittymällä niiden rakenteisiin ja sisältöihin sekä erityisiin syihin miksi organisaatiot käyttävät niitä.

Tämä tutkimus käsittää monimenetelmäisen monitapaustutkimuksen kymmenen organisaation keskuudessa: Laadullista tietoa kerätään ensin 57 ja sitten määrällistä tietoa 53 vastaajalta.

Havainnot osoittavat projektin, kustannusten ja budjetin, aikataulun, riskien, raportoinnin, viestinnän sekä tiedon hallintaan liittyvät järjestelmät tärkeimmiksi organisaatioiden projektinhallintametodologioiden rakenteiksi. Lisäksi havainnot tunnistavat asiakirjapohjat, prosessikuvaukset ja -ohjeet, roolimääritelmät ja -kuvaukset, projektin vähimmäis- ja vaatimusten mukaisuusvaatimukset sekä aikataulunhallintamateriaalit tärkeimmiksi organisaatioiden projektinhallintametodologioiden sisällöiksi. Näiden lisäksi havainnot näyttävät että yhteisen työskentelytavan, projektirakenteiden ja yhteisen projektikielen luominen sekä projektien standardointi ja projektinhallinnan laadun parantaminen ovat tärkeimmät syyt miksi organisaatiot käyttävät organisaatioiden projektinhallintametodologioita.

Nämä tulokset korostavat organisaatioiden projektinhallintametodologioiden samankaltaisuuksia, mutta havainnoista voidaan tunnistaa myös ainutlaatuisia ominaisuuksia ja eroja organisaatioiden metodologioiden rakenteissa ja sisällöissä sekä metodologioiden käyttöön liittyvissä syissä ja näiden painotuksissa.

Havainnot näyttävät, että organisaatiot käyttävät ainutlaatuisia yhdistelmiä organisaatioiden projektinhallintametodologioiden rakenteita ja sisältöjä käsitellessään erityisiä syitä käyttää kyseisiä metodologioita. Tämä viittaa siihen, että ei ole olemassa yhtä parasta tapaa hallita projekteja. Havainnot viittaavat myös siihen, että rakenteet ja sisällöt joita organisaatiot projektinhallintametodologioissa käyttävät, sekä syyt miksi organisaatiot käyttävät projektinhallintametodologioita, riippuvat projektinhallinnan haasteista, jotka liittyvät organisaatioiden ja projektien taustoihin. Lisäksi havainnot viittaavat siihen, että organisaatiot kohdistavat projektinhallintametodologiansa niihin projektinhallinnan osa-alueisiin, joissa ne näkevät eniten parantamisen varaa ja joiden ne katsovat todennäköisimmin parantavan projektien onnistumisen mahdollisuuksia. Lopuksi havainnot viittaavat siihen, että organisaatiot omaksuvat ideoita organisaatioiden projektinhallintametodologioiden rakenteille ja sisällöille ja syyllä miksi organisaatioiden projektinhallintametodologioita käytetään julkisista ja kaupallisista projektinhallintametodologioista sekä organisaatioiden ja projektien taustoihin liittyvistä projektinhallinnan haasteista.

Avainsanat organisaatio, projektinhallintametodologia, rakenne, sisältö, käyttö**ISBN (painettu)** 978-952-60-6585-4**ISBN (pdf)** 978-952-60-6586-1**ISSN-L** 1799-4934**ISSN (painettu)** 1799-4934**ISSN (pdf)** 1799-4942**Julkaisupaikka** Helsinki**Painopaikka** Helsinki**Vuosi** 2015**Sivumäärä** 242**urn** <http://urn.fi/URN:ISBN:978-952-60-6586-1>

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Cape Town, November 2015

Jouko Vaskimo

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List of symbols and abbreviations

AACE: Association for the Advancement of Cost Engineering

ANSI: American National Standards Institute

APM: Association for Project Management

CAPM: Certified Associate in Project Management

ERP: Enterprise Resource Planning

GAPPS: Global Alliance for Project Performance Standards

ICT: Information and Communications Technology

IIL: International Institute for Learning

IJMPB: International Journal of Managing Projects in Business

IJPM: International Journal of Project Management

IM: Information Management

IPMA: International Project Management Association

IS: Information System

ISO: International Organization for Standardization

IT: Information Technology

MS: Milestone

NDA: Non-Disclosure Agreement

NOCOP: Nokia COnnecting Projects

OGC: Office of Government Commerce

OPM3: Organizational Project Management Maturity Model

PfMP: Portfolio Management Professional

PgMP: Program Management Professional

PM: Project Management

PMBOK: Project Management Body Of Knowledge

PMI: Project Management Institute

PMI-ACP: PMI Agile Certified Practitioner

PMI-RMP: PMI Risk Management Professional

PMI-SP: PMI Scheduling Professional

PMJ: Project Management Journal

PMM: Project Management Methodology

PMO: Project Management Office

PMP: Project Management Professional

PRINCE: PRojects IN Controlled Environments

PRINCE2: PRojects IN Controlled Environments release 2

PROPS: PRoject Operation and Planning System

SPM: Semcon Project Management

TG: Toll Gate

UNA: Unified Nokia Approach

UPMM: Unified Project Management Methodology

XLPM: Excellence in Project Management

1. Introduction

1.1 Research background

Project management has been employed since ancient history to manage the delivery of landmarks such as the Stonehenge and the Great Wall of China, and more recently the Panama Canal and the Empire State building. Project management has since become increasingly recognized by the general public through contemporary endeavors delivering the Concorde aircraft, the Apollo space program, and the English Channel tunnel (Morris & Hough, 1987; Packendorff, 1995; Bredillet, 2007a; Morris, 2013).

Despite the centuries of practice, projects are troubled with shortcomings and failures – often relating to insufficient and inappropriate project management. Addressing project management challenges remains a constant topic of interest for project management practitioners and researchers.

Project management practitioners have established associations such as Project Management Institute (PMI) and International Project Management Association (IPMA) in attempts to address the practical challenges, and to promote the profession of project management. Project management practitioners have published volumes such as A guide to the project management body of knowledge (PMBOK Guide) (Duncan, 1996; PMI, 2000; 2004; 2008; 2013a) – a document which has evolved for over 30 years (Duncan, 1995), and which many consider one of the most respected books on the subject of project management (Morris, 2002) – to collect and distribute practical knowledge.

One of the steps project management practitioners are taking is keeping track of project management processes, tools, techniques, methods, and ways of working, and identifying the best ones to use – often referred to as *best practices* and *lessons learned* – for optimizing project performance and reaching of agreed targets. Many organizations participating in projects and employing project management in their development, operation, and maintenance are compiling collections of project management knowledge and experience into project management methodologies (Wells, 2012) by setting up structures and populating the structures with contents intended

to enhance project management in areas in which the organizations face challenges. Such collections of knowledge and experience, developed and operated by organizations for organization-specific reasons, are here referred to as *organizational project management methodologies*. Organizational project management methodologies are used increasingly by contemporary organizations, as the expectations and demands set upon projects and project management continue to increase.

While project management methodologies have been described by authors such as Powell and Young (2004), Kerzner (2006), Hill (2008), and Kerzner (2013), and organizational project management methodologies by authors such as White and Patton (1990), Milosevic (1996), Cormier (2001), White and Fortune (2002), Milosevic and Patanakul (2005), Cicmil, Williams, Thompson, and Hodgson (2006), Patel (2009), and Aziz (2015), research into organizational use of project management methodologies is scarce: Papers and research reports mentioning organizational project management methodologies, apart from recent papers including Wells (2012; 2013) and Joslin and Müller (2014), often leave the concept undefined and without appropriate attention. This is surprising, understanding organizational project management methodologies reveal how project management takes place in specific contexts, including which ways of working are considered most potent for addressing project management challenges.

Wells (2012) investigated the benefits and support project management methodologies provide for project managers, and identified increasing project efficiency and effectiveness as the main benefits organizations target when using project management methodologies. Furthermore, Wells (2013) explored project management methodology types, such as traditional, structured, and agile, recognizing how decisions to use particular project management methodologies are made. Joslin and Müller (2014) studied the effects project methodology elements have on project success, and acknowledged the importance of understanding methodology foundations and degree of methodology customization in assessing project success under different contexts.

While some research to understand project management methodology types, project management methodology components, and reasons why project management methodologies are used has been carried out, further research is needed in order to understand organizational use of project management methodologies. This research investigates organizational use of project management methodologies by focusing on the structures and contents organizations use in organizational project management methodologies, and the specific reasons why organizations use such methodologies.

1.2 Research questions and research framework

This research focuses on organizational project management methodologies. The research questions are:

RQ 1: What structures do organizations use in organizational project management methodologies ?

RQ 2: What contents do organizations use in organizational project management methodologies ?

RQ 3: Why do organizations use organizational project management methodologies ?

RQ 1 focuses on the structures organizations use in organizational project management methodologies. Organizational project management methodology structures align with methodology approaches and intended operating logics, provide organization and coordination of methodology contents, and support holistic methodology comprehension. Organizations use organizational project management methodology structures, often related to project management concepts such as scope, schedule, and cost management, to divide methodologies into project management subject areas which organizations see as enhancing methodologies' abilities to provide expected results.

RQ 2 focuses on the contents organizations use in organizational project management methodologies. Organizational project management methodology contents align with methodology approaches and intended operating logics, and enable and support organizational project management methodologies in meeting the targets organizations have for using such methodologies. Organizations use organizational project management methodology contents, often related to project management tools such as document templates, process descriptions, and process diagrams, to contribute to the project management processes, techniques, methods, and ways of working which organizations see as enhancing project effectiveness and efficiency, and improving the chances of project success.

RQ 3 focuses on the reasons why organizations use organizational project management methodologies. Reasons why organizations use organizational project management methodologies align with methodology approaches and intended operating logics, focus methodology efforts to the main project management challenges, and show the main benefits, such as a common way of working, that organizations expect from methodology use.

The framework shown in Figure 1 is used as the research framework of this research:

Organizations exist under contexts such as the public sector, which initiate organizational needs such as ensuring appropriate public spending, and create project management challenges such as following a strict decision-making scheme. Project management challenges related to organizational contexts can be considered unchanging, as they only change in case organizational contexts change.

Projects are undertaken under contexts such as product development, which initiate project constraints such as minimizing time to market, and create project management challenges such as keeping up with a demanding time schedule. Project management challenges related to project contexts can be considered as changing, as they may be different for each project an organization is involved in.

This research takes the position, that the main influencers affecting organizational project management methodologies are project management challenges related to organizational contexts, and project management challenges related to project contexts. Project management challenges related to organizational and project contexts may overlap and juxtapose one another in complex ways.

Organizations operate organizational project management methodologies, which they populate with structures and contents addressing the specific reasons why organizations use such methodologies. Organizational project management methodologies aim to enhance project effectiveness and efficiency, thus improving the chances of project success.



Figure 1: The research framework used in this research

1.3 Overview of research contributions

This research contributes to project management methodology literature by identifying the structures and the contents organizations use in their organizational project management methodologies, and the specific reasons why organizations use such methodologies.

This study identifies project management structure, cost and budget management system, time schedule management system, risk management system, and reporting, communications, and information system as the most important organizational project management methodology structures.

Additionally, this investigation shows document templates, process descriptions and guidelines, role definitions and descriptions, project minimum and compliance requirements, and time schedule management materials and instructions are the most important organizational project management methodology contents.

Furthermore, this research identifies providing a common way of working, providing structure to projects, standardizing projects and providing consistency, providing common project language and vocabulary, and enhancing quality of project management as the most important reasons why organizations use organizational project management methodologies.

The findings suggest that organizations use unique combinations of organizational project management methodology structures and contents when they address the specific reasons why they use such methodologies. This indicates there is no single best way to manage projects.

The findings also suggest that the structures and contents organizations use in organizational project management methodologies, as well as the reasons for methodology use, depend on project management challenges, which relate to organizational and project contexts.

Furthermore, the findings suggest that organizations focus their project management methodologies on the project management subject areas in which they find most room for improvement, and which they consider most likely to enhance project effectiveness and efficiency, and to improve the chances of project success.

Finally, the findings suggest that organizations adopt ideas for organizational project management methodology structures and contents, and for reasons to use such methodologies from public-domain and commercial project management methodologies, and from project management challenges related to organizational and project contexts.

Chapters 5 and 6 provide more detailed accounts of the contributions of this research.

1.4 Overview of research methods

An inductive mixed-method multiple case study process is used in this research.

Qualitative and quantitative methods are used for collecting and analyzing data from respondents regarding the organizational project management methodologies which are currently used in their respective organizations.

This research is performed in a population of organizations participating in projects, employing project management, and using organizational project management methodologies. This research investigates organizational contexts sector, national culture, and business area in order to gain a thorough and balanced understanding of organizational project management methodologies, and in order to provide a good grounding for the findings.

Semi-structured personal interviews are carried out with 57 individual respondents representing ten case organizations. The collected qualitative data is analyzed within-case to increase understanding of each methodology, and cross-case to create a questionnaire which is completed by 53 of the original 57 respondents representing nine out of the ten case organizations.

The collected quantitative data are analyzed within-case and cross-case, and findings and conclusions emerge from the analyses.

Chapter 3 provides a more detailed account of the research methods used in this research.

1.5 Thesis structure

This thesis comprises several prologues, six main chapters, a list of references, and several appendices.

In order to avoid biasing results and limiting findings with preordained theoretical views, the main literature review was performed after data collections and analyses, as illustrated in Figure 2. The literature review is presented, regardless of this, in the traditional position in Chapter 2 – prior to research methods in Chapter 3, and data analyses in Chapters 4 and 5.

The *prologues* include abstracts in English and Finnish language, acknowledgements, a table of contents, and lists of figures, tables, symbols, and abbreviations appearing in this thesis.

Chapter 1 describes research background, identifies research gaps, poses research questions, describes research contributions, and provides overviews of research methods, thesis structure, key concepts, and scope.

Chapter 2 reviews literature relevant to this research in order to build a theoretical foundation, and to allow comparing emerging results with conflicting and concurring literature.

Chapter 3 describes the case organizations, the research setting including the philosophical and methodological choices, and the research process used in this research.

Chapter 4 presents the within-case analyses of qualitative and quantitative data, describing the case organizations' organizational project management methodologies individually.

Chapter 5 presents the cross-case analyses of qualitative and quantitative data, comparing the case organizations' organizational project management methodologies against each other.

Chapter 6 summarizes theoretical contributions and managerial implications, provides an evaluation of this research, and recommends directions for future research.

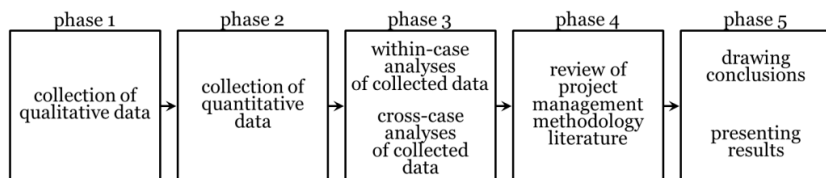


Figure 2: High-level structure of the research process used in this research

1.6 Key concept definitions

Project refers to a temporary endeavor to deliver agreed deliverables.

Project management refers to the coordinated activities to direct and control a temporary endeavor delivering agreed deliverables.

Project manager refers to the person accountable for coordinated activities to direct and control a temporary endeavor delivering agreed deliverables.

Project Management Office refers to an organizational structure or function assisting project managers in performing project management.

Project management methodology refers to a collection of project management knowledge and experience, including processes, practices, tools, techniques, methods, and ways of working intended to address project management challenges, and to ensure successful project completion (Hill, 2008) with combinations of normative, descriptive and prescriptive means (Duncan, 1998) structured and populated to enhance the methodology ability to provide the expected results.

Organizational project management refers to the organizational use of project management principles and practices in ways which contribute towards project targets in ways which fit organizational and project contexts.

Public-domain project management methodologies refers to the project management methodologies, standards, and bodies of knowledge that are available without commercial motives. Public-domain project management methodologies comprise structures and contents which provide foundations for addressing project management challenges in most projects, most of the time. PRINCE2 (PRojects IN Controlled Environments, release 2) is an example of a public-domain project management methodology.

Commercial project management methodologies refers to the project management methodologies, standards, and bodies of knowledge that are available with commercial motives. Commercial project management methodologies include more specific structures and contents than public-domain project management methodologies, and provide platforms for addressing project management challenges in specific projects, specific organizations, or specific contexts. UPMM (Unified Project Management Methodology) is an example of a commercial project management methodology.

Organizational project management methodologies refers to the project management methodologies in use in organizations to address project management challenges related to organizational and project contexts. NOCOP (Nokia Connecting Projects) is an example of an organizational project management methodology. Organizational project management methodologies may include variants for addressing specific challenges:

NOCOP light project is an example of an organizational project management methodology variant, aimed at addressing the challenges of small and simple projects.

Project management methodology structures refers to structures which align with methodology approaches and intended operating logics, provide organization and coordination of methodology contents, and support holistic comprehension of the methodologies. Organizations use organizational project management methodology structures, often related to project management concepts such as scope, schedule, and cost management, to divide methodologies into project management subject areas which organizations see as enhancing the methodologies' abilities to provide expected results.

Project management methodology contents refers to contents which align with methodology approaches and intended operating logics, and enable and support organizational project management methodologies to meet the targets organizations have for using such methodologies. Organizations use organizational project management methodology contents, often related to project management tools such as document templates, process descriptions, and process diagrams, to contribute to the project management processes, techniques, methods, and ways of working which organizations see as enhancing project effectiveness and efficiency, and improving the chances of project success.

Reasons why organizations use organizational project management methodologies refers to reasons which align with methodology approaches and intended operating logics, focus methodology efforts to the main project management challenges, and show the main benefits organizations expect from methodology use, such as a common way of working.

Project management challenges refers to demanding matters the project manager must deal with, such as delivering complex scope, working with tight budget, maintaining limited time schedule, and following a strict decision-making scheme.

Project efficiency refers to the efficiency with which project uses time and resources to provide agreed deliverables. Project efficiency can be assessed by comparing time and resources spent against deliverables provided.

Project effectiveness refers to the extent to which a project delivers agreed deliverables. Project effectiveness can be assessed by comparing delivered deliverables against agreed deliverables.

Project success refers to the extent to which a project delivers agreed deliverables within agreed targets, such as scope, time, cost, and quality. Project efficiency and effectiveness are key factors of project success.

1.7 Delimitations of scope

This research involves a population of organizations carrying out projects and performing project management, and following organizational project management methodologies while doing so. Eight organizations are sought through theoretical sampling to represent different sectors, national cultures, and business areas as suggested by Powell and Young (2004), Crawford and Pollack (2007) and Sauser, Reilly and Shenhar (2009).

This research involves theoretical sampling of cases, which limits the generalizability of research results to the contexts selected, however, the organizations participating in this research are purposefully chosen through diverse sampling to represent the selected population so that the findings from this research have stronger foundation, and that the contributions can be applied throughout the chosen population (Harris & Sutton, 1986; Gersick, 1988; Eisenhardt, 1989). Due to the theoretical sampling, the results from this research do not allow for statistical conclusions to be drawn or statistical generalizations – such as how typical is it for organizations carrying out projects and performing project management to be using an organizational project management methodology – to be made.

This research involves understanding that organizations and projects which follow organizational project management methodologies encounter challenges with project effectiveness, efficiency, and success. It is also understood that organizational project management methodologies cannot always provide the level of project effectiveness, efficiency, and success which the involved organizations and projects expect. The extent to which organizational project management methodologies enhance project effectiveness and efficiency, and improve the chances of project success, as well as the reasons and circumstances for such limitations are beyond the scope of this research.

This research comprises two consecutive phases, with the second phase building on the results of the first phase. The first phase results are used as they are, except for minor modifications in the development of the research instrument for the second research phase. For this reason some traditional project management subject areas, such as project scope management, and some new project management subject areas, such as agile ways of working, scarcely appear in the second phase of this research. Such incidents, which follow from the mixed methods approach chosen for this research, are not intended to undermine the importance of any project management subject areas not appearing in the second phase of this research, nor are they intended to emphasize the importance of any project management subject areas appearing in the second phase of this research.

2. Literature review

This chapter contains a review of literature relevant to this research. This review establishes the theoretical foundation and context of this research. The reviewed papers have been selected mainly by focusing on academic project management journals such as *International Journal of Project Management* (IJPM), *Project Management Journal* (PMJ) and *International Journal of Managing Projects in Business* (IJMPB).

2.1 Introduction

This literature review was performed after empirical work, as shown in Figure 3, in order to avoid biasing results and limiting findings.

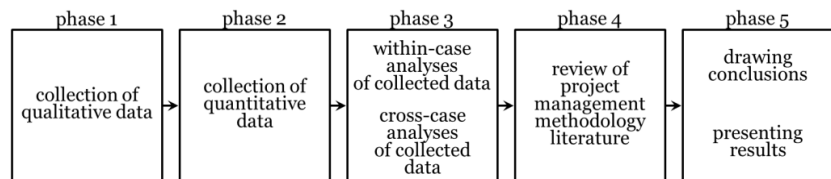


Figure 3: High-level structure of the research process used in this research

This chapter contains an introduction and three main sections:

2.2 Organizational project management methodologies

2.3 Public-domain project management methodologies

2.4 Commercial project management methodologies

2.2 Organizational project management methodologies

White and Patton (1990) described a private commercial organization running into a state of internal chaos, and focused on how it was able to manage the chaos and reverse the competitive decline by using a concurrent project management methodology based on interdisciplinary project team approach, empowering of project participants, and making use of available synergy benefits. Jayaratna (1994) described a methodology, in general, as ...

... an explicit way of structuring one's thinking and actions. Methodologies contain model(s) and reflect particular perspectives of 'reality' based on a set of philosophical paradigms. A methodology should tell us what steps to take, in what order and how to perform those steps but, most importantly, the reasons 'why' those steps should be taken, in that particular order. (Jayaratna, 1994, p. 242)

Lewis (1995) described PRINCE methodology use in a library computer system replacement project at the University of Wales Bangor, and suggested the use of project management techniques at higher education, encouraging: "Although the task of adopting such methods appears daunting, the possible alternative of expensive failure is perhaps more frightening" (p. 231). Conroy and Soltan (1997) found contemporary project management tools unable to provide sufficient decision-making and conflict-handling support, and created a project management methodology for assisting project managers with multi-disciplinary challenges. Clarke (1999) found structured project management methodologies a potential way to significantly enhance projects, and remarked many organizations consider project management methodologies organizational reporting tools as opposed to useful systems allowing for project organizations to help themselves. Cormier (2001) encouraged building of organizational project management methodologies, and identified establishing a common and consistent way of working; providing tools, templates, and techniques aligned with organizational policies; creating a common project lexicon; defining organizational project structures; setting project roles and responsibilities; describing the implementation of various project types; tying project management to organizational infrastructure, culture, and processes; and building credibility with stakeholders as the main benefits from using such a methodology.

White and Fortune (2002) investigated project managers' experiences from using methods, methodologies, tools and techniques, and found 54.2% of respondents use an in-house project management method, 15.6% use PRINCE or PRINCE2, and 2.1% use an in-house methodology similar to PRINCE. 24% of PRINCE or PRINCE2 users and 14% of in-house project

management methodology users had experienced limitations with the methodology: Inadequate for complex projects, difficult to model real world, too heavy in documentation, and too time consuming were the most-often-reported limitations relating to project management methodology use. Crawford, Costello, Pollack and Bentley (2003) described Australian government encouragement for public organizations to use formal project management methodologies – developed in a ‘hard’ project context – in an effort to increase project effectiveness. Crawford et al. developed a ‘soft’ system project management approach for integrating soft systems’ methods into project management methodologies. Müller (2003) investigated IT project manager communications, and suggested “... project managers should aim for stable communication practices with their customers, achieved through focus on clearly understood project management methodologies ...” (p. 353).

Distinguishing generic project management methodologies from tailored organizational project management methodologies, Powell and Young (2004) noted a generic project management methodology “... spells out the steps to be followed for the development and implementation of a project” (p. 952) while an organizational project management methodology ...

... ensures that people and systems can speak a common language across a multiple-project enterprise setting. It must ensure that the way in which projects are carried out fits the context and the culture of the organization. It is created and therefore ‘owned’ by the organization, and it focuses on its specific needs – sector, culture, size, structure, and so on. (Powell & Young, 2004, p. 953)

Furthermore, project management methodologies are said to include practices, methods, procedures, processes and rules as shown in Figure 4.

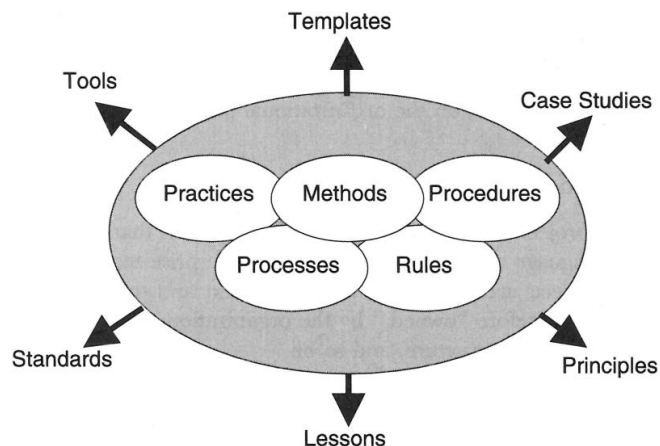


Figure 4: Project management methodology (Powell & Young, 2004, p. 954)

Metaxiotis, Zafeiropoulos, Nikolinakou and Psarras (2005) presented a goal-directed project management methodology for Enterprise Resource Planning (ERP) project use, highlighting the methodology ability to enhance project scheduling, budgeting and scope management. Results from using the methodology, including implementation and optimal adaptation of the ERP system, encourage building similar project management methodologies for enhancing ERP project performance. Cicmil, Williams, Thomas and Hodgson (2006) considered project management methodologies "... universally applicable as a neat and orderly solution to implementing complex organisational initiatives" (p. 681) and argued for a new research approach which would take a serious look into practitioners' experiences of projects. Complexity, uncertainty, and schedule constraints were acknowledged as the main reasons for project overruns, and agile and lean aspects often integrated into IT project management methodologies were noted.

Kerzner (2006) claimed it is almost impossible for an organization to be a global leader without a world-class project management methodology, and listed characteristics of such a methodology:

- Maximum of six life-cycle phases
- Life-cycle phases overlap
- End-of-phase gate reviews
- Integration with other processes
- Continuous improvement (i.e. hear the voice of the customer)
- Customer oriented (Interface with customer's methodology)
- Companywide acceptance
- Use of levels (level 3 work breakdown structure (WBS))
- Critical path scheduling (level 3 WBS)
- Simplistic, standard bar chart reporting (standard software)
- Minimization of paperwork (Kerzner, 2006, p. 144, brackets in original text)

Hobbs and Aubry (2007) found 76% of the 500 Project Management Offices (PMOs) participating in their research involved in the development and implementation of a project management methodology: "The PMO with these functions is often in the role of promoting the use of the methodology, the development of competencies, and project management in general. This group thus constitutes a coherent set of functions that reinforce one another" (p. 82). Jaafari (2007) studied the health of large projects and programs on their way to their targets, noting sick endeavors with no systemic approach proceed in a disorganized way, whereas healthy endeavors with systemic structures, such as project management methodologies and standards, proceed in an organized manner.

Rehman and Hussain (2007) compared five project management methodologies, – *PRINCE2*, *Rational Unified Programming*, *Agile Development Methods*, *Microsoft Solution Framework*, and *Information Technology Infrastructure Library* – against PMBOK Guide (PMI, 2004) and noted expert opinion, previous working experience, government regulations, stakeholder and client preferences, and client location were the main methodology selection criteria. Schoenberg and Ra (2007) described adopting a project management methodology for an airline, and reported their procedure toward a PMBOK Guide (PMI, 2004) -based initiating and planning methodology as a vehicle for increasing chances of project success and reaching strategic goals. Smyth and Morris (2007) defined methodology as “... a *system* about *how* we go about something” (p. 424, emphases in original text) and noted “... we need to recognise that recommendations based on these insights [regarding general patterns of managing projects] cannot be applied mechanically with the expectation of automatic outcomes: applicability is contingent upon *context*” (p. 424, emphasis in original text). Smyth and Morris noted the PMBOK Guides “... reflect an essentially ‘execution’ view of the discipline, completely omitting reference to the crucial definitional stages” (p. 424). This is the case with most public-domain and commercial project management methodologies.

Hill (2008) defined a project management methodology ...

... a standard, repeatable process to guide project performance from concept to completion. It introduces and applies generally accepted project management techniques and practices that fit within the culture and business needs of the relevant organization. It includes identification of the roles and responsibilities associated with each process step, as well as specification of the input and output for the prescribed sequence of process steps. In essence, a project management methodology conveys to project managers and project team members what to do and how to do it ... The specification of standards and practices is what differentiates the project management methodology from a technical methodology. The project management methodology is a set of processes that can be applied to all types of projects in the relevant organization ... Ideally, the organization’s project management methodology will be constructed to integrate one or more technical processes for seamless use. (Hill, 2008, p. 3 ... 4)

Nogeste (2008) recognized the Australian Department of Justice requirement for projects to be managed with PRINCE2, the standard approach in public sector projects in the UK. Young and Jordan (2008) investigated the effects of top management support toward project success, and found project management methodologies effective for project risk management and resource management purposes, however, not the most important factors

contributing to project success. Young and Jordan argued “Project managers must recognize the limitations of project methodologies and allow projects to focus on project success rather than project management success even though they cannot be accountable for the realization of outcomes/benefits” (p. 721).

Crawford and Helm (2009) found project management methodologies “...streamlining processes and assisting time-constrained staff in doing their work, and in all cases there was recognition, however reluctant, of the accountability and transparency that the systems provided ...” (p. 85). Investigating PRINCE2 use in IT projects, Patel (2009) argued “The increasing role of project management methodologies in managing large or small projects remains a key challenge for many organizations” (p. 1387). Reporting a general feeling PRINCE2 provides expected benefits regardless of the challenges with its methodological clarity and with IT use of PRINCE2, Patel mentioned advancing communications, coordinating of activities and resources, enhancing scheduling, budgeting and resources, improving control of quality and progress, and optimizing the business case as the most common reasons IT organizations were using a project management methodology. Zwikaël and Smyrk (2009) criticized project management methodologies for emphasizing output delivery as opposed to benefits realization, and suggested an inputs-transferred-into-outcomes type project management methodology to complement the traditional input-process-output process models. Zwikaël and Smyrk argued “This view indicates that meeting objectives, realizing benefits and effecting change represent the real rationale for a project” (p. 634).

Aubry, Müller, Hobbs and Blomquist (2010) investigated project management offices, and identified “Degree to which methods are actually followed” (p. 770) as key data regarding an organizational project management methodology. Labuschagne and Steyn (2010) investigated project management practices in South Africa, and found that project management methodologies enhance scheduling, budgeting and quality measures, and that a project management methodology enhanced consistency of project results, however, achieving a successful project management methodology requires sufficient project management knowledge and maturity from the focal organization. Massis (2010) investigated using project management in library endeavors, opening his paper “The project management methodology can provide a library with a tool it can use to deliver a project using an effective and efficient technique so that the blueprint for success can be developed, followed and realized” (p. 526), considering project management a methodology per se. This point of view is not widely agreed to, as project management is not usually referred to as methodology. Artto,

Kulvik, Poskela and Turkulainen (2011) investigated project management office role in innovation front end, and referred to the Hill (2008) list of PMO tasks, the first one being “... practice management, including the sub-tasks of project management methodology, project tools, standards and metrics, and project knowledge management ...” (p. 413).

Recognizing the increasing use of organizational project management methodologies in enhancing project efficiency and effectiveness, Wells (2012) identified in her study of four ICT organizations operating in UK the capability organizational project management methodologies have *to enable control and monitoring, to provide standardization and unified language, to ensure winning proposal bids and contracts and to guide and direct managers with uncertainty and unknown*. Referring to the 2008 and 2010 CHAOS reports by the Standish Group, Wells (2012) argued ...

Since 1999, to date PMMs are firmly placed as one of the top ten contributing factors toward project failure, according to the Standish Group (CHAOS, 2010). In the 2008 version of the CHAOS report, it was stated that, although improvements in the rate of project success (35%) are obtained, the rate of failure (19%), and challenged (46%) project performance remain at levels that deserve further attention. (Wells, 2012, p. 3*)

... and found misalignment between expected strategic benefits and reported operational benefits from project management methodologies, and indication project management methodology users’ proficiency, responsibility, and attitude play a key role in determining how many of the expected benefits are achieved. Noting 47.9 % of her respondents failed to see any benefit from an organizational project management methodology, Wells (2012) concluded ...

... PMMs are found to be useful to some extent where they replace and compensate for the absence of tacit knowledge in a project, helping managers with less experience and knowledge of project management ... Most project managers perceived the prime purpose of PMM to be management, control, and compliance rather than support and guidance. The investigation on this aspect reveals that 47.9% of project managers viewed PMMs as non-beneficial to their projects and claimed that using PMMs hinders their project delivery. (Wells, 2012, p. 19)

Kerzner (2013) described project management methodologies in private sector and listed items which influence project management methodology design, including *company strategy, project complexity, management faith in project management, project budget, expected project life cycle*,

* Wells’ reference (CHAOS, 2010) appears in this thesis as (Standish Group, 2010)

technology, customers, training needs, and supporting tools. Kerzner defined project management framework as “The individual segments, principles, pieces, or components of the processes needed to complete a project. This can include forms, guidelines, checklists, and templates” (p. 17) and a project management methodology as “The orderly structuring or grouping of the segments or framework elements. This can appear as policies, procedures, or guidelines” (p. 17) and differentiating between the two, felt organizations competing in the global marketplace were increasingly turning from project management methodologies toward project management frameworks. Kerzner’s view of a project management methodology is shown in Figure 5.

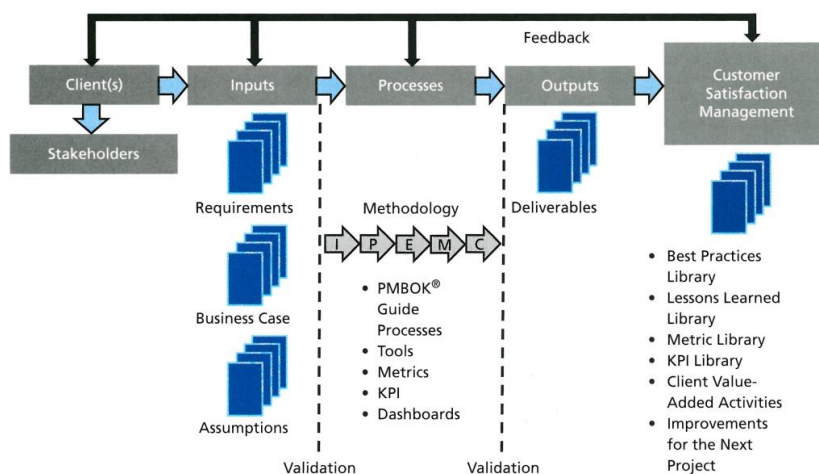


Figure 5: Project management methodology (Kerzner, 2013, p. 19)

Wells (2013) investigated the role organizational project management methodologies play in successful management of Information Technology (IT) and Information System (IS) projects in private and public sectors, and looked into how and why certain methodology types are selected to be used. Defining project management methodology “A high level description of the way in which projects are to be managed which may include methods, processes, actions, practices, roles, procedures and rules” (p. 3) she identified three organizational project management methodology types – *traditional*, *structured*, and *agile* – and suggested there are too many different project types for single methodology to cover them all. Recognizing the gap between research proposing for the best-fitting methodology to be used, and practical motives to use a popular methodology supported by training program, Wells (2013) defined *type-agnostic* as ...

... referring to something that is generalised so that it is interoperable among various systems. The term can refer not only to software and hardware, but also to business and management processes and practice. A Greek word prefixed with a... meaning without and Gnosis meaning knowledge. Hence Type Agnostic here implies with no particular type in mind. (Wells, 2013, p. 3)

... and noted ...

... the selection and implementation of PMMs [project management methodologies] is usually mandated via strategic organisational directives ... as a result of this top-down approach PMMs are selected and applied in a type-agnostic and context-free manner, which leads to limitations and shortcoming in the value of using PMMs for effective project delivery. (Wells, 2013, p. 2)

Young and Poon (2013) investigated the role of top management support for project success, and realized traditional project management approaches – project management methodologies, user involvement, and capable project staff – may be taking focus off of top management support. Investigating the impact project environments have on the connection between project methodologies and project success, Joslin and Müller (2014) found environmental factors influence how and to what extent project methodologies are able enhance the likelihood of project success: “PMOs will understand the need to customize their organization’s project methodology(s) according to project type and environmental context.” (p. 1).

Nokia COnnecting Projects (NOCOP) is an example of an organizational project management methodology, developed and used by Nokia PLC*. NOCOP is generic and expected to be used in all projects throughout the organization. Nokia business units are encouraged to develop NOCOP variants in order to optimize the fit between NOCOP and the organizational and project contexts.

NOCOP is based on the PMBOK Guide, follows the divide into *project management processes* and *product-oriented processes*, and uses a combination of *process areas* and *project phases* as shown in NOCOP framework diagram in Figure 6. NOCOP’s project management processes are included in the *Project Management* process area, and product-oriented processes in the *Change Management*, *Process and Concept*, *Authorization and Security*, *System Solution and Configuration*, *Support*, *Technology and Infrastructure*, *Testing*, and *Training* process areas. NOCOP is based on seven *E* milestones: E-1: *Project study initiated*; EO: *Project initiated*; E1: *Scope freeze and project authorized*; E2: *Process & concept freeze*; E3:

* Nokia is not one of the case organizations participating in this research.

Solution freeze; E4: *Delivery commitment*; E5: *Project termination*. Projects comprise six phases – *Project Study*, *Project Planning*, *Process & Concept Development*, *Solution Development*, *Final Preparation*, and *Handover* – in between the seven milestones. NOCOP includes five variants for enhancing methodology fit with project contexts: *Program*, *create project*, *Unified Nokia Approach (UNA) create project*, *deploy project* and *light project*.

NOCOP relies on activity and deliverable checklists to “Shorten program / project schedules ... Improve program / project planning accuracy ... reduce program / project costs ... improve the quality of program / project deliverables ...” (Nokia, 2004a, p. 11).

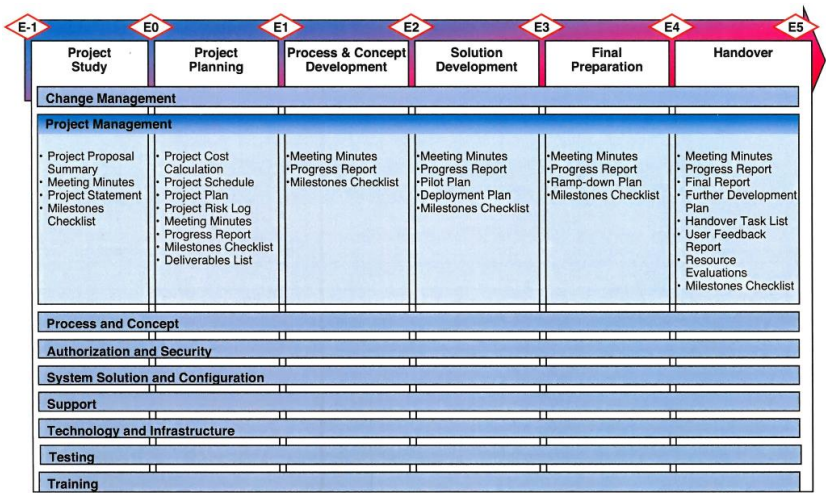


Figure 6: NOCOP framework diagram (Nokia, 2004b)

The literature reviewed in this section identifies project management methodologies as structured collections of project management knowledge and experience, intended to enhance project efficiency and effectiveness, and chances of project success. Project management methodologies instruct project management staff how, when, and why to initiate, plan, execute, control, monitor, and close projects. Employed at the level of the entire organization, organizational project management methodologies use a selection of structures and contents to address project management challenges related to organizational and project contexts. By addressing these project management challenges, organizations attempt to enhance project efficiency and effectiveness, and to improve the chances of project success.

Hill (2008) introduced a four-phase project management methodology life cycle in which methodology platform and components are chosen in the *develop methodology solution* phase, as shown in Figure 7.

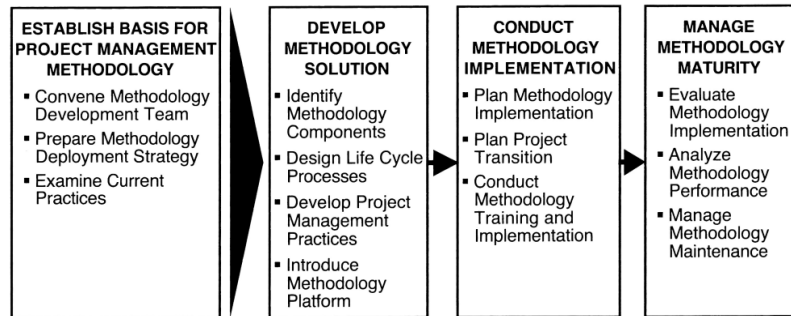


Figure 7: Project management methodology life cycle (Hill, 2008, p. 8)

Cicmil, Dorđević and Zivanovic (2009) remarked Serbian nongovernmental organizations and local authorities expecting international funding needed “... to deploy and demonstrate the use of a systematic, documented, and disciplined management approach according to donors’ preferred project management standards and methodologies” (p. 92). Hurt and Thomas (2009) described combining PMBOK Guide (PMI, 2008) process approach with industry best practices, and achieving a methodology benefitting junior and senior project managers as well as contractors.

Aubry, Müller, Hobbs and Blomquist (2010) investigated project management offices, and identified “Homegrown or brought in from outside” (p. 770) as key data regarding an organizational project management methodology. McHugh and Hogan (2011) noted client demand for a recognized methodology, ensuring best practices, enhanced recruitment, and contracting possibilities as the main drivers for an internationally-recognized methodology, and mentioned the PMBOK Guide and PRINCE2 as the internationally-recognized methodologies most organizations appeared to be structuring and populating their organizational project management methodologies on.

Aziz (2015) recognized the changes organizational project management methodology deployments bring, claimed deployments are best managed with program management, and suggested an approach for deploying, integrating, and sustaining project management methodologies: “By focusing attention on the organizational impact and required behavior modifications, organizations can better realize the intended business benefits through improved adoption, integration, and sustainable results” (p. 3).

2.2.1 Standardization and flexibility

Milosevic (1996) studied organizational project management, and finding organizations unable to afford ad hoc project management, suggested organizations create standardized project management through organizational project management methodologies:

To design and implement a project management methodology demands a substantial amount of energy, time, and expertise. It is not reasonable to assume that each project manager tasked with a 'unique' project would have the energy, time and expertise to develop this one-of-a-kind project management methodology. Rather, they never develop the methodology, and in the absence of it, they resort to the best traditions of daily firefighting. (Milosevic, 1996, pp. 12 ... 14)

Duncan (1998) deliberated on whether PMBOK Guide (Duncan, 1996) is a standard or not, finally arriving to a conclusion that the PMBOK Guide is a standard. In the process Duncan explained three standards categories:

Descriptive standards. These are documents that tell the facts, details, or particulars of something. A document that described the characteristic symptoms of a flu sufferer would be a *descriptive standard*.

Normative standards. These are documents that provide guidelines (norms) to be used as a basis for measurement, comparison, or decisions. A document that listed alternative approaches to treating the flu would be a *normative standard*.

Prescriptive standards. These are documents that define a particular way of doing something. A document that specified a two-week course of a specific antibiotic would be a *prescriptive standard*. (Duncan, 1998, p. 57, emphases and brackets in original text)

Gunnarson, Linde and Loid (2000) investigated standardization of project organization work, and concentrated on project management methodologies intended to provide common terminology and way of working, including standardized project management activities, documents and decision-making in multi-project companies. Recognizing project management methodologies are becoming increasingly popular in multi-project organizations, and that organizations – open systems subject to internal and external contingencies – adjust their methodology structures according to contingency theory in order to enhance their effectiveness and ability to provide expected results, Gunnarson, Linde and Loid concluded that senior managers' tactical control appears to be the main motive for using project management methodologies, as opposed to providing operative control. Pennypacker and Grant (2003) noted organizations often implement project management processes as well as integrated support processes to pre-

pare project staff for implementing projects effectively: “In general, companies should be working to establish all project management processes as organizational standards. This ... requires the development of formal, documented standards that are applied throughout the company, with very few exceptions” (p. 9). Shenhar and Dvir (2004) recognized projects’ diversity, and that there is no *one size fits all* approach to managing projects.

Crawford (2005) investigated the effect project management standards have toward enhancing project management performance in the workplace from the perspective of senior management: She recognized the growing number of organizations adopting project management approaches, the mounting cumulative demand for professional project managers, and the increasing interest in standards related to training, assessment and certifying project managers as well as developing organizational project management methods and methodologies, however, failed to find a significant relationship between generally available project management standards, in their entirety, and senior management perception of workplace performance and effectiveness. Milosevic and Patanakul (2005) identified project management *tools, leadership, process, organization, information management system, metrics* and *culture* as factors which are central to project management standardization, and suggested project management standardization should be started with *tools, leadership* and *processes* as they best support project success. Milosevic and Patanakul concluded by proposing contingency approach for standardizing project management, finding single standard approach unlikely to fit all projects.

Cicmil and Hodgson (2006) noted project management methodologies, such as PRINCE, enable public sector control budget, time schedule and quality, and acknowledged the Packendorff (1995) finding practitioners only tend to use the most basic project management methodologies, and in ways and under circumstances for which the methodology was never intended. Noting the drive toward standardized project management sometimes causes cultural clashes, individual resistance, loss of motivation and lack of commitment, Cicmil and Hodgson concluded “It becomes obvious that, frequently, the very principles of effective, structured project management methodology are simultaneously its major causes of failure” (p. 116). Crawford (2006) investigated organizational project management capability, and found project management methodology a recurring subject. She described a research in which a participating organization recognized methodological variances between different sites: The drive for all sites to use the same methodology faced resistance and feelings some processes are unreasonable for certain projects and certain project managers: “A sense of tension between desire for corporate control and standardization and cor-

porate pressure for performance, allied with project management reluctance to follow process, emerges from the text” (p. 81).

Kerzner (2006) described standardization of organizational project management, and acknowledged the role of repositories for housing best practices, lessons learned, processes, methods, procedures and templates, and for making them available for project personnel. Crawford and Pollack (2007) studied the generic nature of project management knowledge and practice, and noted project management standards are used in the creation of project management methodologies assuming a positive relationship exists between such standards and effective workplace performance. Noting that project management guides assume that projects are alike, and that these guides are written on a general level to provide guidance to most projects most of the time, Crawford and Pollack analyzed results across countries, sectors, and application areas, and concluded ...

... the tension between uniqueness and similarity does need to be managed, if the field is to remain relevant to the wide variety of countries, industries, and application areas in which it is currently applied ... future standards development should address the needs of different industries and application areas, and any development of global standards for project management needs to recognize the potential variation in how project management is practiced and thought about in different countries. (Crawford & Pollack, 2007, p. 95).

Studying centralized project management office contribution to virtual project team success, Curlee (2008) identified standardized organizational processes as key components of organizational project management methodologies. Hobbs, Aubry, and Thuillier (2008) investigated organizational project management offices, and recognized the dilemma between organizational drive to standardize project management processes and project managers’ need for practical flexibility:

But when it is time to put the [project management] methodology into application, confrontations are rather the norm. The tension between standardization and flexibility is closely related to issues of power and control. Standards are followed or not, depending on who has the power to decide. (Hobbs, Aubry & Thuillier, 2008, p. 552)

Pons (2008) considered the stage-gate type standardized project approach well-suited for managing product development projects, and recognized the suggestion some researchers make regarding project management methodologies being excessively dominating for new product development work, mainly focusing on planning and prescribing, as opposed to developing by trial and error, empathy, and co-operation. Hurt and Thomas (2009) inves-

tigated the value available from organizational project management offices, and noted an organizational PMO should aim at a balance between flexibility and standardization:

In essence, the PMO's core ideology should be based on the notion that ... flexibility AND a standard methodology are compatible concepts, as is the ability to be both a competent leader AND manager, have both a people AND a task focus, and manage internal AND external relationships. (Hurt & Thomas, 2009, pp. 65 ... 66, emphases in original text)

Lechler and Cohen (2009) investigated steering committee role in project management, and found widely varying levels of formality within the organizational project management methodologies, and varying shares of projects which actually follow organizational project management methodologies. Aubry, Müller, Hobbs and Blomqvist (2010) investigated project management offices in transition, and found project management standardization, and the need to identify appropriate level of standardization key PMO functions: "This issue could go in two directions: not enough standardization or too much" (p. 773). Aubry et al. concluded ...

It could be described as a double transformation going from an over standardization of "one size fits all" project management approach to a flexible approach adapted to the project needs ... The impetus for more project management standardization comes from two sources. First, there is the cost of duplication for reinventing the wheel within each unit. Second, the global portfolio management requires common ways of managing projects on specific items such as the phases of the project life cycle or the definition of different types of costs in projects. The resulting PMO mandate is to implement such project management processes, methodologies and tools throughout all the units of the organization. (Aubry, Müller, Hobbs & Blomqvist, 2010, p. 774)

Artto, Kulvik, Poskela and Turkulainen (2011) investigated the project management office role in innovation front end, and recognized PMO tasks "... practice management, including the subtasks of project management methodology, project tools, standards and metrics, and project knowledge management ..." (p. 413).

The literature reviewed in this section identifies project management standardization as a key reason why project management methodologies are used, however, reminds a degree of flexibility is also required: Instead of opposing, standardization and flexibility are seen as compatible concepts. In order to enhance the benefits from organizational project management methodologies, organizations are encouraged to find the organization-specific optimum blends of standardization and flexibility.

2.2.2 Tailoring and adaptive applying

Laufer, Denker and Shenhar (1996) identified approaches project managers take in turbulent projects, and recognized adjusting project management methodology according to circumstances as a key component toward project success. Charvat (2003) defined methodology as “... a set of guidelines or principles that can be tailored and applied to a specific situation” (p. 3) and emphasized that there is no one-size-fits-all project management methodology, nor right or wrong project management methodology, provided that the methodology is appropriately tailored and applied. Charvat asserted that in order to provide the expected results, project management methodologies must be maintained so that they match the organizational strategies, tactics, foci, and directions. Project life cycle, market sector, product, size, technology used, and project situation were identified as contingencies to be considered when selecting methodology structure and contents. Charvat recommended a *pick-and-choose* type modular, modifiable methodology structure which allows project staff to choose the methodology components that best fit the project, and sufficient flexibility for applying the selected components to achieve optimum fit with project needs.

Recognizing the challenge in creating organizational project management methodologies for global organizations with ranges of different projects, and highlighting the need for project management methodologies to be adapted according to project needs, Powell and Young (2004) concluded project management methodologies must be developed to match the users’ needs – and that it is critical that the methodology users understand this. Cheema and Shahid (2005) proposed a customization system for enhancing the fit between project management methodology and project: They concluded that both project management methodology tailoring and customization are necessary for achieving fit between methodologies and projects.

Milosevic and Patanakul (2005) encouraged creating organizational project management methodologies which optimize the balance between standardization and flexibility by establishing standardized project management methodology structures and contents, and allowing project management staff to adaptively apply these structures and contents in ways which best enhance project effectiveness and efficiency, and increase the chances of project success. Milosevic and Patanakul argued the most important project management standardization items – project management tools, leadership skills and process – “... are typically customized to fit the strategic purpose of the company” (p. 181).

Zielinski (2005) found organizational project management methodologies fairly standard, and asserted some practices and principles – such as allow-

ing sufficient flexibility to adaptively apply the methodology to fit the project, and admitting one size does not fit all projects – make some project management methodologies stand out from the rest. Rehman and Hussain (2007) recommended against following project management methodologies without customizing them according to projects' needs.

Cicmil, Đorđević and Zivanovic (2009) described adoption of project management in Serbian organizations, and acknowledged the need to achieve a fit between ...

... project management principles, concepts or methodologies, and organizational cultures, individual ambitions, and formal and psychological contracts between the relevant employees and the organization. In many ways, this aspect of the project management implementation reveals the sources of motivation and pride as well as resistance. (Cicmil, Đorđević & Zivanovic, 2009, p. 95)

Cooke-Davies, Crawford and Lechler (2009) found the fit between organizational strategy and configuration of the project management system affects the value available from project management, and agreed with the Shenhar and Dvir (1996) finding that project management should be adapted to relevant context. 'Blind' use of project management standards and methodologies was criticized, as a lack of fit between methodology and relevant contexts was considered sufficient reason for project failure: "The underlying hypothesis of this perspective is that project success is related to choice of the 'right' management approach related to specific project characteristics" (p. 110).

Hällgren and Maaninen-Olsson (2009) advised against blind use of the PMBOK Guide (PMI, 2008), asserting that there will always be deviations from original plan which must be addressed. Aubry, Müller, Hobbs and Blomquist (2010) investigated project management offices, and remarked "... a 'fit' should exist with the organizational context" (p. 776) and the organizational project management methodology. Noting the methodology-like appearance of the PMBOK Guide (PMI, 2008), Morris and Geraldi (2011) acknowledged the normative character and closed system approach reflecting the positivist thinking of the 1950s and 1960s: "There is nothing necessarily wrong with this, as long as it fits its context and needs, and indeed the user is encouraged to tailor the choice of topics and their applications to fit a project's needs" (p. 21).

Whitaker (2012) highlighted the encouragement in PMBOK Guide (PMI, 2008) towards tailoring of project management methodologies: "For any given project, the project manager, in collaboration with the project team, is always responsible for determining which processes are appropriate, and the appropriate degree of rigor for each process." (PMI, 2008, p. 38).

Kerzner (2013) emphasized the need for project management methodologies to be applied according to project needs:

It may not be possible to create a single enterprise-wide methodology that can be applied to each and every project. Some companies have been successful doing this, but there are still many companies that successfully maintain more than one methodology. Unless the project manager is capable of tailoring the enterprise project management methodology to his/her needs, more than one methodology may be necessary. (Kerzner, 2013, p. 14)

Morris (2013) argued project management guidance and application must be tailored and applied in order to enhance their fit with project context:

I have long held that the deployment of project management practices depends on: (1) the character and expectations of the industry sector – say, defence/aerospace versus big pharma drug development versus oil and gas; (2) the character, culture and expectations of the enterprise; (3) ditto of the Business Unit; and (4) ditto possibly of the program or project. There is no real research to back this up, however. (Morris, 2013, p. 244)

Wells (2013) emphasized the importance of flexibility achieved through methodology tailoring. PMI (2014) introduced a methodology tailoring process to provide methodology scalability and flexibility: Project type, size, complexity and risk were identified as key factors affecting tailoring.

The literature reviewed in this section shows that tailoring and adaptive application are used for enhancing organizational project management methodology fit with project management challenges: *Tailoring* is usually referred to as the enhancing of organizational project management methodology fit with organizational contexts. Organizational contexts, such as organization sector, business area, size, cultural aspects, strategies, tactics, and foci affect how, to what extent, and how often organizational project management methodology structures and contents, and the specific reasons to use such methodologies are tailored. The results of tailoring are visible in the within-case and cross-case analyses in Chapter 4 and Chapter 5. *Adaptive application* is usually referred to as the enhancing of organizational project management methodology fit with project contexts. Project contexts, such as project size, application area, type, risk, life cycle, market sector, product, and project situation, as well as *novelty*, *technology*, *complexity* and *pace* as described by Shenhar and Dvir (2004) affect how, and to what extent organizational project management methodology structures and contents, and the specific reasons why such methodologies are used are adaptively applied.

2.2.3 Voluntary and mandatory use

Clarke (1999) noted project management staff often views project management methodologies as something mandatory which provide little help, assistance or other useful purpose. Clarke found that “... in an effort to create some degree of standardisation across an organisation, project management approaches used can often end up being very prescriptive – based on a series of checklists, guidelines and mandatory reporting forms” (p. 141), and warns “Previous history of problems, a weariness of change and lack of commitment have all contributed to a general lack of motivation to be a part of the change” (p. 144). Clarke suggested enhancing confidence and commitment, improving communication, and leading by example as the potential solutions for these challenges.

Cicmil and Hodgson (2006) identified “individual resistance to imposed procedures and practice, and a lack of confidence and motivation” (p. 116) as key challenges for mandatory use of a project management methodology, and noted “It becomes obvious that, frequently, the very principles of effective, structured project management methodology are simultaneously its major causes of failure” (p. 116). Pons (2008) investigated the use of project management practices in new product development, and remarked on the popular use of a stage-gate type project management methodology, in which mandatory checkpoints and decision gates are set up in between major stages: “This approach fits well with conventional project management methods, such as the Gantt chart, in which the gates may be represented as milestones. The stage-gate methodology applies concurrent engineering and sets mandatory activities for various stages” (p. 84).

Hurt and Thomas (2009) noted sustainable use of a project management methodology requires maintenance and development of methodology core parallel to structures and components surrounding the core. Maintaining methodology core includes *on-boarding*, familiarizing of internal and external, experienced and inexperienced project management staff with the project management methodology structure and contents: “Investing in proper on-boarding allows the company to explain its adaptation of key processes, identifies those artifacts that are mandatory, and reinforces *why* it is important to do certain tasks” (p. 66, emphasis in original text). Aubry, Müller, Hobbs and Blomquist (2010) investigated project management offices, identifying “Use is compulsory or discretionary” (p. 770) as a key element of data regarding organizational project management methodologies.

The literature reviewed in this section indicates voluntary use of project management methodology structures and contents may provide better results than mandatory use.

2.2.4 Light project management methodologies

White and Patton (1990) described project management methodologies' critical success factors, and recommended further research "... to keep organizations that tend to over-document and over-proceduralize from transforming a simple, flexible, and responsive process into one which is overly complex, rigid, and sluggish" (p. 213). Crawford and Helm (2009) noted organizations using PRINCE2 (OGC, 2005) or PMBOK Guide (PMI, 2008) as methodology foundation enjoyed improved satisfaction despite claims that the methodology is overly work-intensive, time-consuming and bureaucratic, especially for small projects.

Mengel, Cowan-Sahadath and Follert (2009) acknowledged a PMBOK Guide -inspired project management methodology, and emphasized the satisfaction stakeholders received from projects implementing management consistently and according to organizational best practices. It was noted that the less demanding projects may simultaneously find a comprehensive methodology and documentation requirements overkill: "... project managers of the more traditional and 'smaller' infrastructure projects in particular would prefer more flexibility in this regards" (p. 34).

Turner, Ledwith and Kelly (2010) investigated project management in small and medium-sized firms, and noted small and medium-sized firms "... require less bureaucratic forms of project management than those used by larger, traditional organizations" (p. 744): Several alternatives, including hybrids and modular structures, are seen as existing between the light-duty and heavy-weight extremes. Turner, Ledwith and Kelly noted that small and medium-sized enterprises would seldom adopt formal project management methodologies as they are overly bureaucratic and require excessively formalistic structures, and argued small and medium-sized organizations "... need a 'lite' version of project management" (p. 755). Turner, Ledwith and Kelly described their target was to establish – in addition to a 'lite' version of project management – a more simplified 'micro lite' version for smaller companies which required an even less labor-intensive way of managing projects. Kerzner (2013) described the need smaller projects with less complexity had for light methodologies:

A totally new breed of methodology – which is agile, adaptive, and involves the client every part of the way – is starting to emerge. Many of the heavyweight methodologies were resistant to the introduction of the "lightweight" or "agile" methodologies. (Kerzner, 2013, p. 16)

David Snowden (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007) defined a framework for complex systems he refers to as the *Cynefin Framework*, as shown in Figure 8.

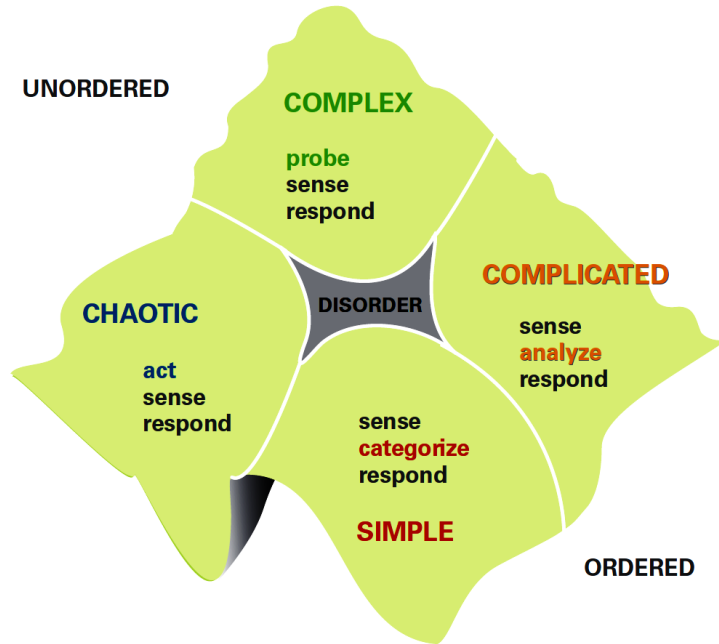


Figure 8: The Cynefin Framework (Snowden & Boone, 2007, p. 72)

Translated literally as *habitat*, the Welsh language word *cynefin* means a state in which one is influenced by multiple pasts, something that one can only be partly aware of. With the Cynefin Framework Snowden established a typology of contexts that guides the kinds of explanations or solutions which might apply in complex situations.

The Cynefin Framework (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007), which Snowden describes as a *sense-making model*, comprises *ordered* and *unordered* systems, and *disorder* in the center of the framework. The ordered system comprises the *simple* and *complicated* domains, whereas the unordered system comprises the *complex* and *chaotic* domains.

Snowden (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007) defined the *simple domain* – also known as *obvious domain* – as an ordered system, in which cause- and-effect relationships exist, processes are predictable and repeatable, and outcomes can be determined in advance: The main decision-making model is *sense* → *categorize* → *respond*. Practices Snowden refers to as *best practices* are applied in this domain.

The *complicated domain* is the other ordered system, in which the cause-and-effect relationships are not self-evident, and require expertise. The main decision-making model is *sense* → *analyze* → *respond*. Practices Snowden refers to as *good practices* are applied in this domain. Snowden sees a key difference between what he referred to as *best practices* and *good practices* (which I simply refer to as *best practices* throughout this thesis): Best practices provide expected results without special expertise; good practices require sufficient expertise to work. Snowden claims enforcing the use of good practices in the complicated domain can be risky as some people may become irritated, and may revert to best practices which Snowden does not expect to work in the complicated domain.

Snowden (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007) defined the *complex domain* as an unordered system, in which cause-and-effect relationships are only visible in hindsight, and in which outcomes cannot be determined in advance. The main decision-making model is *probe* → *sense* → *respond*. Experiments are used, and *emergent practices* – new ways of doing things – are applied in this domain. The *chaotic domain* is the other unordered system, in which cause-and-effect relationships cannot be determined. It may be entered deliberately for innovation, however, if entered accidentally one attempts to stabilize the situation as soon as possible. The main decision-making model is *act* → *sense* → *respond*: All practices are *new*.

Snowden (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007) defined the center of the Cynefin Framework as *disorder*, in which one struggles to know the domain one is in: There is a tendency for one to determine the domain based on one's personal preference for action.

Snowden claimed the Cynefin Framework enhances understanding of the complex systems one is dealing with, which enables appropriate ways of thinking and appropriate actions. The core notion is to adjust one's way of thinking and actions based on system complexity: One size does not fit all.

The Cynefin Framework makes sense of project management methodologies: Public-domain, commercial, and organizational project management methodologies operate with what Snowden referred to as *good practices* within the *complicated domain*. Light project management methodologies fit, respectively, the *best practices* and the *simple domain*. Project management methodologies may work with *emergent practices* such as *agile* within the *complex domain*, however the *new practices* at the chaotic domain are beyond the reach of most project management methodologies.

The literature reviewed in this section indicates that light project management methodologies may serve projects with limited complicatedness and complexity, in what Snowden defined as the *simple domain*.

2.2.5 Point of inflection

Cheema and Shahid (2005) recognized appropriate processes and methods are critical for project success, however, asserted project management methodologies can be detrimental in case benefits fail to justify resources spent, especially as different projects require different project management methodologies for appropriate fit between project and methodology. Milosevic and Patanakul (2005) found a positive correlation between project management standardization and project success, however, drew attention to the point of inflection beyond which standardization is unlikely to provide further benefits:

Specifically, increasing the degree of standardization of the factors to a certain point may lead to the increase in project success. Increasing the degree of standardization of the factors beyond that point tends to lower project success. Where this inflection point exactly is appears to be company-specific, meaning that it varies from company to company. (Milosevic & Patanakul, 2005, p. 186)

Hurt and Thomas (2009) recognized that in addition to project management methodologies, the point of inflection – illustrated in Figure 9 – applies to all investments in project management, and noted “Clearly, a question of major importance is ‘How do organizations increase or sustain the value received from investments in project management and, more specifically for us, in PMOs?’” (p. 65)

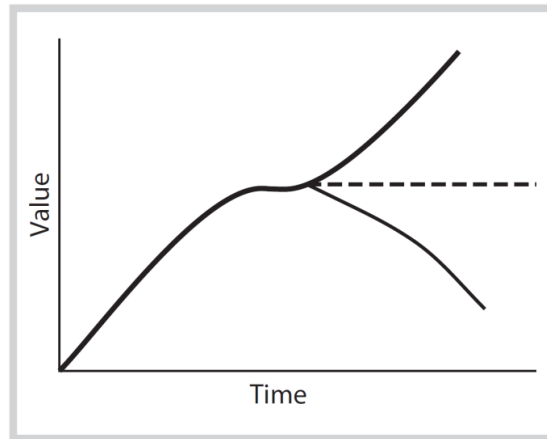


Figure 9: Point of inflection (Hurt & Thomas, 2009, p. 65)

The literature reviewed in this section indicates the point of inflection needs to be considered when developing project management methodologies.

2.3 Public-domain project management methodologies

In this research project management standards such as ISO 21500, project management bodies of knowledge such as PMBOK Guide, and project management methods such as PRINCE2 are considered *public-domain project management methodologies*. For the benefit of this literature review also the *Agile software development* defined in the *Manifesto for Agile Software Development* (Beck et al., 2001), and *Scrum* (Takeuchi & Nonaka, 1986) are considered public-domain project management methodologies. Several comparable systems, such as *IPMA Competence Baseline for Project Management* (IPMA, 2006), *APM Body of Knowledge* (APM, 2012), *Managing successful programmes* (OGC, 2011a), *Management of portfolios* (OGC, 2011b), and *P2M* (PMAJ, 2005a; 2005b) exist, however, this literature review focuses on PRINCE2, PMBOK Guide, ISO 21500, Agile, and Scrum.

Axelos Ltd represents *PRjects IN Controlled Environments* (PRINCE2), Project Management Institute (PMI) *A guide to the project management body of knowledge* (PMBOK guide), and International Organization for Standardization (ISO) *ISO 21500:2012 Guidance on project management*. The *Manifesto for Agile Software Development* is a proclamation by seventeen renowned software developers who explain an enhanced way of developing software. Scrum is one of the agile software development methodologies which applies the principles set in the *Agile Manifesto*.

PRINCE2, PMBOK Guide, and ISO 21500 are generic, whereas the Agile ways of working and SCRUM are mainly intended for software development. Of the three generic methodologies only PRINCE2 is a project management methodology: The PMBOK Guide states "... this standard is a guide rather than a specific methodology. One can use different methodologies and tools (e.g., agile, waterfall, PRINCE2) to implement the project management framework" (PMI, 2013a, p. 2). ISO 21500 states "This International Standard provides guidance for project management and can be used by any type of organization, including public, private or community organizations, and for any type of project, irrespective of complexity, size or duration" (ISO, 2012, p. 1). Strictly speaking not even PRINCE2 is a methodology, as it "... is a structured project management method based on experience drawn from thousands of projects ..." (OGC, 2009, p. 3).

Public-domain project management methodologies such as PRINCE2, PMBOK Guide, and ISO 21500 can be adopted and used as organizational project management methodologies as they are, however, they are intended to be used as foundations on which commercial and organizational project management methodologies are built (OGC, 2009; PMI, 2013a; ISO, 2012).

2.3.1 PRINCE2

PRjects IN Controlled Environments (PRINCE2) is a public-domain project management methodology used extensively in public sector projects in the UK and the British Commonwealth. PRINCE2 focuses on the management, control and organization of a project, and is generic and so structured and populated that it may be used with any kind of project regardless of project context, type and size. PRINCE2 project management methodology is connected to the PRINCE2 certification system, which recognizes individuals who know the methodology with *PRINCE2 Foundation* certificates, individuals who are able to apply the methodology in practice with *PRINCE2 Practitioner* certificates, and individuals who participate in a residential assessment of team working capabilities with *PRINCE2 Professional* certificates. PRINCE2 focuses on project management, and connects to *Managing Successful Programmes* (OGC, 2011a) and *Management of Portfolios* (OGC, 2011b) for management of programs and portfolios, respectively. PRINCE2 (OGC, 2009) is currently out with the fifth edition. PRINCE2 structure, based on seven PRINCE2 principles, seven PRINCE2 themes, and seven PRINCE2 processes, is shown in Figure 10.

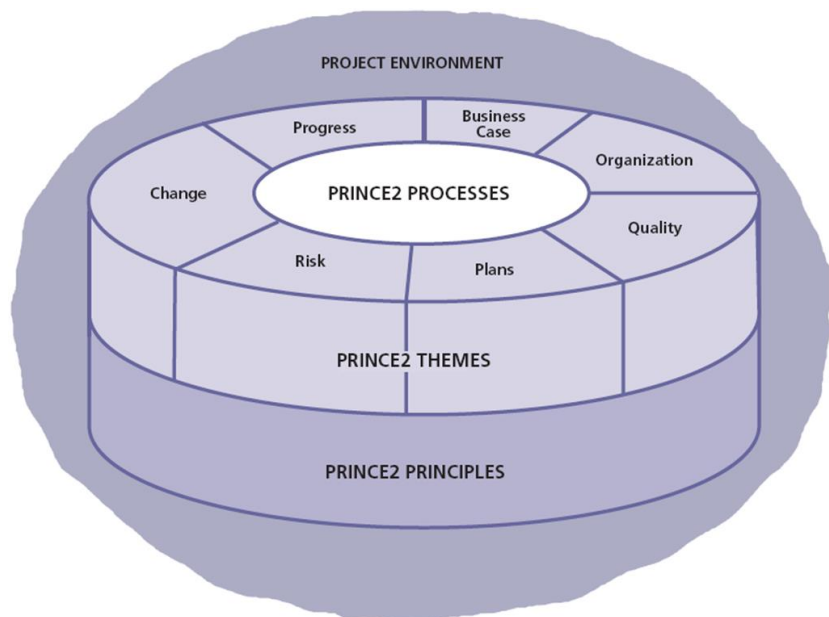


Figure 10: PRINCE2 structure (OGC, 2009, p. 6)

PRINCE2 principles, PRINCE2 themes, and PRINCE2 processes are summarized in Table 1. The use of PRINCE2 processes is shown in Figure 11.

Table 1: PRINCE2 principles, themes and processes (OGC, 2009)

PRINCE2 principles	PRINCE2 themes	PRINCE2 processes
Continued business justification	Business case	Starting Up a project (SU)
Learn from experience	Organization	Directing a Project (DP)
Defined roles and responsibilities	Quality	Initiating a Project (IP)
Manage by stages	Plans	Controlling a Stage (CS)
Manage by exception	Risk	Managing Product delivery (MP)
Focus on projects	Change	Managing a Stage Boundary (SB)
Tailor to suit project environment	Progress	Closing a Project (CP)

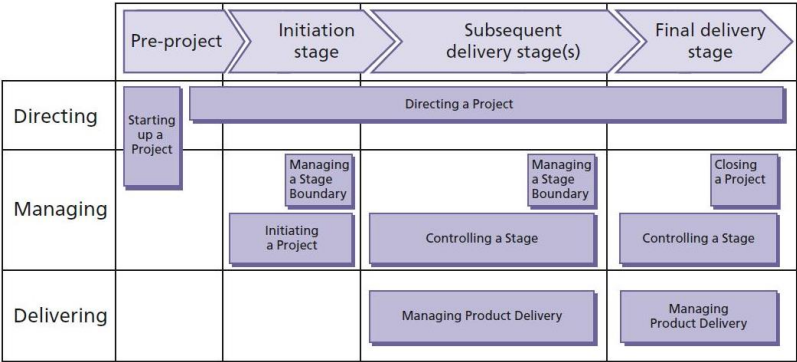


Figure 11: PRINCE2 processes (OGC, 2009, p. 113)

2.3.2 PMBOK Guide

A guide to the project management body of knowledge (PMBOK guide), (PMI, 2013a) is a collection of recognized and reputable project management practices, processes, and terminology for managing a project. PMBOK Guide focuses on project management with a generic process-based approach based on dividing projects into *project management processes* and *product-oriented processes* so that the PMBOK Guide may be used with any project regardless of project context, type, and size. PMBOK Guide is currently out with the fifth edition, and focuses on project management.

The PMBOK Guide connects to the PMI certification system, which recognizes individuals' experience and knowledge, starting from *Certified Associate in Project Management (CAPM)*, and progressing through *Project Management Professional (PMP)* and *Program management Professional (PgMP)* up until *Portfolio Management Professional (PfMP)*. PMI also operates a system of specific individual certifications including *PMI Agile Certified Practitioner (PMI-ACP)*, *PMI Risk Management Professional (PMI-RMP)*, *PMI Scheduling Professional (PMI-SP)* and *Organizational Project Management Maturity Model (OPM3) Professional Certification*.

The PMBOK Guide focuses on project management, and connects to *The standard for program management* (PMI, 2013b) and *The standard for portfolio management* (PMI, 2013c) for management of programs and portfolios, respectively. The PMBOK Guide framework diagram, including the system of ten *knowledge areas* and the five *project management process groups*, is shown in Table 2.

Table 2: PMBOK Guide framework diagram (PMI, 2013a, p. 61)

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

The PMBOK Guide is the *American National Standards Institute* (ANSI) standard ANSI/PMI 08-001-2012 on project management, The standard for program management (PMI, 2013b) ANSI/PMI 08-002-2012 standard on program management, and The standard for portfolio management (PMI, 2013c) ANSI/PMI 08-003-2012 standard on portfolio management.

Morris (2002) acknowledged the PMBOK Guide as one of the most respected books on the subject. Smyth and Morris (2007) noted in their investigation of epistemological evaluation of project management research ...

The *PMBOK Guide* is the formal model of project management for a very great many people and enterprises. It is the most simplistic, with a primary focus upon task execution and fails to refer to the management of front-end issues, exogenous factors, strategy or human factors. It is a product of the 'traditional' paradigm and the information processing paradigm feeds into this. PMBOK is epistemologically closely associated with positivism, seeking general explanations and solutions for practice, tending to disregard context. (Smyth & Morris, 2007, p. 425, emphases in the original text)

Smyth and Morris criticized the attempt project management bodies of knowledge make to structure project management knowledge, noting "... the variety of different contexts is too great to allow for much to be said that is useful" (p. 426). Regardless of this, Crawford and Helm (2009), Hurt and Thomas (2009), Hällgren and Maaninen-Olsson (2009), Mengel et al. (2009), and McHugh and Hogan (2011) found various editions of the PMBOK Guide (Duncan, 1996; PMI, 2000; 2004; 2008) being used as the foundation on which organizational project management methodologies had been developed.

2.3.3 ISO 21500

ISO 21500:2012. Guidance on project management, (ISO, 2012) is an international standard introducing a standardized system, including terminology and guidance, for managing projects. ISO 21500 focuses on project management with a generic process-based approach using *subject groups* and *process groups* in a way which allows for ISO 21500 to be used with any project regardless of project context, type and size. ISO 21500 is out with the first edition, and focuses on project management. It connects to ISO 21503 focusing on program management, ISO 21504 focusing on portfolio management, ISO 21505 focusing on governance of projects, programs, and portfolios, and ISO 21506 providing a vocabulary for project, program, and portfolio management. ISO 21500 framework diagram, illustrating the ten *subject groups* and the five *process groups*, is shown in Table 3.

ISO 21500 is not aimed at certification or regulatory use. ISO does not offer document templates matching the structures and contents of ISO 21500.

Table 3: ISO 21500 framework diagram (ISO, 2012, p. 10)

Subject groups	Process groups				
	Initiating	Planning	Implementing	Controlling	Closing
Integration	4.3.2 Develop project charter	4.3.3 Develop project plans	4.3.4 Direct project work	4.3.5 Control project work 4.3.6 Control changes	4.3.7 Close project phase or project 4.3.8 Collect lessons learned
Stakeholder	4.3.9 Identify stakeholders		4.3.10 Manage stakeholders		
Scope		4.3.11 Define scope 4.3.12 Create work breakdown structure 4.3.13 Define activities		4.3.14 Control scope	
Resource	4.3.15 Establish project team	4.3.16 Estimate resources 4.3.17 Define project organization	4.3.18 Develop project team	4.3.19 Control resources 4.3.20 Manage project team	
Time		4.3.21 Sequence activities 4.3.22 Estimate activity durations 4.3.23 Develop schedule		4.3.24 Control schedule	
Cost		4.3.25 Estimate costs 4.3.26 Develop budget		4.3.27 Control costs	
Risk		4.3.28 Identify risks 4.3.29 Assess risks	4.3.30 Treat risks	4.3.31 Control risks	
Quality		4.3.32 Plan quality	4.3.33 Perform quality assurance	4.3.34 Perform quality control	
Procurement		4.3.35 Plan procurements	4.3.36 Select suppliers	4.3.37 Administer procurements	
Communication		4.3.38 Plan communications	4.3.39 Distribute information	4.3.40 Manage communications	
NOTE The purpose of this table is not to specify a chronological order for carrying out the activities. Its purpose is to map subject groups and process groups.					

2.3.4 Agile software development

Agile software development refers to a collection of software development methods in which requirements and solutions are developed incrementally in an evolutionary collaboration of cross-functional self-organizing teams. The Agile software development methods follow the 2001 *Manifesto for Agile Software Development* (Beck et al., 2001), also known as the *Agile Manifesto*, as published by a group of renowned software developers:

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck	James Grenning	Robert C. Martin
Mike Beedle	Jim Highsmith	Steve Mellor
Arie van Bennekum	Andrew Hunt	Ken Schwaber
Alistair Cockburn	Ron Jeffries	Jeff Sutherland
Ward Cunningham	Jon Kern	Dave Thomas
Martin Fowler	Brian Marick	

(Beck et al., 2001, text layout and emphases as in original text)

The Agile software development methods have become an alternative for the *waterfall model* introduced by Royce in 1970 (Royce, 1970; Larman & Basili, 2003). While a degree of agility is an integral part of all project management, the Agile software development emphasizes adaptive planning, iterative, incremental and evolutionary development, early delivery, continuous improvement, as well as rapid and flexible response to change (Agile Alliance, 2015). With the Agile methods' ability to elude software project failure, Agile methods are being introduced increasingly into projects in business areas other than IT: Conforto, Salum, Amaral, da Silva, and de Almeida (2014), as well as Serrador and Pinto (2015) have investigated such use of Agile methods, and found them able to contribute towards project success.

Agile software development does not endorse specific ways of working, methodology and project structures, tools, or templates. Agile Alliance (2015) recommends for employers not to certify their employees in Agile software development. Instead of a project management methodology, Agile software development may be better characterized as a category of incremental collaborative practices for cross-functional development.

2.3.5 Scrum

Scrum is a project management framework for managing the development of software products following the doctrine of the Agile Manifesto by Beck et al. (2001). Scrum is a flexible and holistic way of implementing product development in which a group of people works as a team in order to achieve a common target. Scrum provides an alternative to the Royce (1970) waterfall model for software development with an incremental and iterative approach involving a system of *Sprints* – recurring development phases of 5 to 20 working days – and *Scrums* – recurring every working day, as shown in Figure 12.

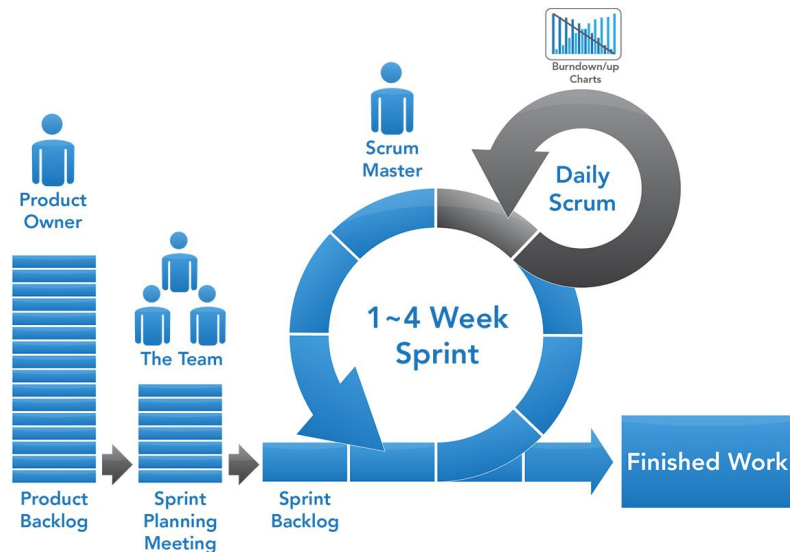


Figure 12: Scrum process diagram (Patch, 2015)

Sutherland and Schwaber (2014) defined Scrum “A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value” (p. 3) and characterized Scrum as *lightweight* and *simple to understand*, yet *difficult to master*. A key concept of Scrum is that the product requirements may change. This sometimes causes a back-and-forth change of product specification known as *requirements churn*.

Scrum advises developers on key roles, tools, and ways of working. Certificates such as *Certified Scrum Master* and *Certified Scrum Product Owner* are available from several global providers. Scrum does not include a project manager role, and Scrum is sometimes referred to as the project management method within Agile. Further to this, some see Scrum as a replacement for project management in IT business (Scrum Alliance, 2015).

2.4 Commercial project management methodologies

In this research project management methodologies such as the *Unified Project Management Methodology* (UPMM) and the *Excellence in Project Management* (XLPM), published with commercial motives, are considered *commercial project management methodologies*. International Institute for Learning, Inc. (IIL) represents the UPMM, and Semcon Project Management AB (SPM) the XLPM methodology.

Commercial project management methodologies such as UPMM and XLPM can be adopted and used as organizational project management methodologies as they are, however, they are intended to be used as platforms on which organizational project management methodologies are built (IIL, 2014; SPM, 2014).

2.4.1 UPMM

Unified Project Management Methodology (UPMM) (IIL, 2014) is a generic commercial project management methodology. International Institute for Learning is closely connected to PMI, and the latest version of UPMM is highly aligned with the latest version of PMBOK Guide, including the framework structure, the knowledge areas and the process groups: UPMM “... contains entire *PMBOK Guide* and access to guidelines ...” (IIL, 2014, emphasis in original text). UPMM has been available since 2003.

UPMM is provided as a software suite, with several different digital editions and choices regarding installing and operating the software. UPMM is claimed to “... continually improve project performance ... maximize the effectiveness of a project management initiative ... drive project management excellence and improves the success of projects” (sic) (IIL, 2014). UPMM includes “... step-by-step guide to project management ... interactive, visual, and complete process diagrams ... excellent training resource ... hundreds of templates ... glossary ... an open system ... online coaching and project management consulting ... full project management knowledge base ...” (IIL, 2014).

UPMM includes three variants related to project size for enhancing methodology fit with project contexts: *Small* PM methodology, *Medium* PM methodology, and *Large* PM methodology. UPMM is fitted with an administrator portal to enable tailoring processes and diagrams in order to further enhance the methodology fit with organizational and project contexts. UPMM framework diagram is shown in Figure 13.

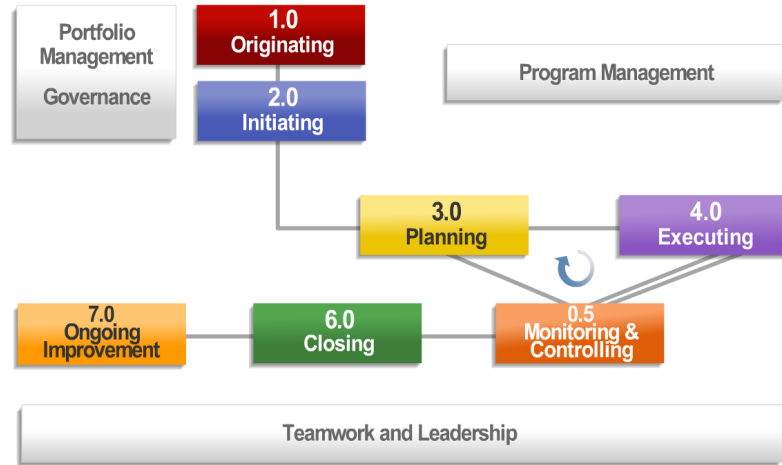


Figure 13: UPMM framework diagram (IIL, 2014, www.iil.com/upmm)

2.4.2 XLPM

Excellence in Project Management (XLPM) is a generic commercial project management methodology. XLPM is the commercial version of *Ericsson Telecom AB* organizational project management methodology *PROject Operation and Planning System* (PROPS) – first released in 1989 – now offered for non-Ericsson users under the XLPM brand through a web interface. Kerzner (2006) considered PROPS – the XLPM predecessor – “... one of the most successful methodologies in the world” (p. 151). XLPM is currently out with the second edition.

XLPM follows PMI materials, and the XLPM knowledge areas – shown in Figure 14 – follow those in the PMI PMBOK Guide.

Integration	Integration of stakeholders, interfaces and dependencies
Value	Definition and management of project value
Scope	Definition and management of scope and acceptance
Quality	Definition and mgmt of quality in performance and outcome
Procurement	Planning and management of procurement of project result
Time	Management and control of lead-time and time-schedule
Cost	Budgeting and control of project cost and revenues
Human Resource	Resource acquisition and management of project teams
Risk	Management and control of risks in the project
Communication	Planning and control of project information flow

Figure 14: XLPM knowledge areas (SPM, 2014, xlpn-online.com)

XLPM provides project management support, tools, and templates, and follows a phase / gate structure with project phases, *tollgates* (TG) TGo ... 5, and *milestones* (MS) MS1 ... 6. XLPM defines tollgate a “... decision point in a project at which formal decisions are made concerning the aims and execution of a project. At each tollgate, a business assessment of the project and its alignment to strategies is made ...” (SPM, 2014, xlpn-online.com), and milestone a “... critical event in the project that is defined by a specific and measurable result that must be achieved at a specified time and cost” (SPM, 2014, xlpn-online.com). XLPM tollgates are TGo: *Decision to start project analysis phase*; TG1: *Decision to start project planning phase*; TG2: *Decision to establish project*; TG3: *Decision to continue project execution*; TG4: *Decision to start hand-over of project outcome*; TG5: *Decision to start project conclusion*. XLPM framework diagram is shown in Figure 15, and XLPM project life cycle model in Figure 16.

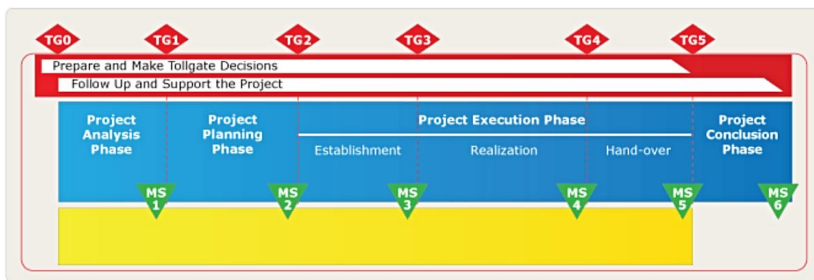


Figure 15: XLPM framework diagram (SPM, 2014, xlpn-online.com)

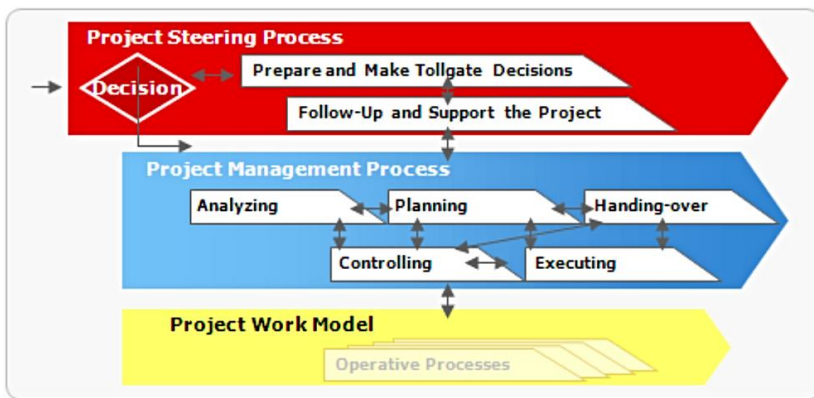


Figure 16: XLPM project life cycle model (SPM, 2014, xlpn-online.com)

The literature reviewed in this section indicates public-domain and commercial project management methodologies are available to allow organizational project management methodologies to be developed and maintained by building on, adopting, and adapting them: Public-domain project management methodologies provide generic project management methodology foundations, including structures and contents, which all organizations can use in all projects. Commercial project management methodologies provide more specific project management platforms, including structures and contents, which most organizations can use in most projects. Public-domain and commercial project management methodologies are intended to be adapted into organizational use through tailoring and adaptive application so that the resulting methodology best addresses the project management challenges related to organizational and project contexts.

3. Research methods

This chapter describes the research methods used in this research.

3.1 Introduction

This chapter comprises an introduction and three main sections:

3.2 Case organizations

3.3 Research setting

3.4 Research process

Case organizations introduces the organizations participating in this research. *Research setting* describes the circumstances under which this research was carried out, and *research process* the steps through which this research progressed.

A mixed-method multiple case design was followed in this research: Qualitative data collection was performed in the first phase, and quantitative data collection in the second phase of this research. The main within-case and cross-case analyses were performed in the third phase of this research. Relevant literature was reviewed in the fourth phase of this research. Conclusions were drawn, and results presented in the fifth phase of this research. The literature review was performed after the main empirical work was completed to avoid biasing results and limiting findings with preordained theoretical views (Eisenhardt, 1989). A high-level structure of the research process used in this research is shown in Figure 17.

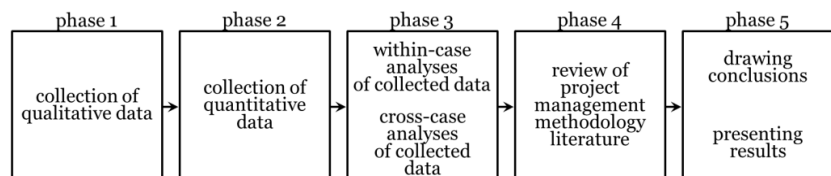


Figure 17: High-level structure of the research process used in this research

3.2 Case organizations

When inviting organizations to participate in this research, it was agreed all case organizations will be treated confidentially and anonymously. A virtual name, in the form of alphabet **A ... J** – written in bold typeface to distinguish an organization from other text – was assigned to each case organization. The assigned virtual names, and an introduction of the case organizations participating in this research are shown in Table 5.

Triangulation of data sources was used to gain a balanced understanding of each case organization: In order to reduce bias, to balance out any highly personal views, and to increase data consistency (Shepherd, 2015) two developers, two users, and two managers of organizational project management methodology use and development in each case organization were invited to participate in this research. 13 organizational project management methodology developers, 21 users, and 23 managers participated in the first phase of this research, while 13 developers, 19 users, and 21 managers participated in the second phase of this research. 57 respondents, 22 female and 35 male, participated in the first phase of this research, while 53 respondents, 22 female and 31 male, participated in the second phase of this research. The roles and numbers of respondents representing the case organizations are shown in Table 4.

Table 4: Roles and numbers of respondents representing the case organizations

case organization	methodology developers	methodology users	methodology managers	total
A	2	2	2	6
B	1	3	2	6
C	2	2	2	6
D	1	2	2	5
E	2	1	3	6
F	1	3	3	7
G	2	2	2	6
H	1	2	3	6
I	1	2	2	5
J*	-	2 / -	2 / -	4 / -
total (phase 1)	13	21	23	57
total (phase 2)	13	19	21	53

* Organization **J** only participated in the phase 1 of this research.

Table 5: Assigned virtual names and an introduction of the case organizations participating in this research

case	sector	HQ in	business area	business motive	customer base	number of projects	total project budget	methodology built on	methodology started in	driver for methodology start
A	private	Europe	ICT	for-profit	internal, external	several hundred	several hundred M€	PMBOK, organizational and project contexts	early 1980s	business units began organically developing systematic ways of organizing project work
B	private	Europe	engineering, production & service	for-profit	external	> 350	> 700 M€	PMBOK, organizational and project contexts	late 1990s	a common way of managing projects was required when new project business unit started
C	private	North America	ICT	for-profit	internal	> 250	> 320 M€	PMBOK, GAPPs, commercial methodology, organizational and project contexts	late 1990s	having acquired several companies, the parent company decided a common way of working was required
D	private	Africa	project management consulting	for-profit	external	> 150	> 650 M€	PMBOK, ISO, AACE, organizational and project contexts	late 1990s	a common way of managing projects was needed when organization started growing in size
E	public	Europe	ICT	not-for-profit	internal	> 100	tens of M€	organizational & project contexts	mid 1980s	IT department started organically developing project guidelines & document templates
F	public	Europe	multidisciplinary research	not-for-profit	internal, external	~ 2700	~ 270 M€	organizational and project contexts	1980s	need to increase project management formality and to align research projects with quality standards
G	public	Europe	ICT	not-for-profit	internal	> 70	> 20 M€	PRINCE2, organizational and project contexts	2010	study showed low level of project management maturity & insufficient project management foundations
H	public	Europe	multidisciplinary research	not-for-profit	internal, external	> 1000	> 600 M€	IPMA, PMBOK, organizational and project contexts	1980s	organization became involved in a series of international projects of extreme size and complexity
I	private	Europe	engineering, production, & service	for-profit	external	> 200	> 5400 M€	commercial methodology, organizational and project contexts	2007	project management benchmarking process implemented in the business group
J*	private	Europe	engineering, production, & service	for-profit	external	~ 20	~ 300 M€	organizational and project contexts	1999	started from scratch, grew organically towards best-practice-based common way of working

* Organization **J** only participated in the first phase of this research.

3.3 Research setting

This section describes the circumstances and settings under which this research was carried out.

3.3.1 Introduction

This section follows the *research onion* concept introduced by Saunders, Lewis and Thornhill (2012): The research setting is covered through a series of layers, starting with philosophy on the outer layer and proceeding inwards one layer at a time until the setting is fully explained.

This section includes an introduction and six subsections:

- 3.3.2 Philosophy
- 3.3.3 Approach
- 3.3.4 Methodological choice
- 3.3.5 Strategies
- 3.3.6 Time horizon
- 3.3.7 Techniques and procedures

The research onion concept is shown in Figure 18.

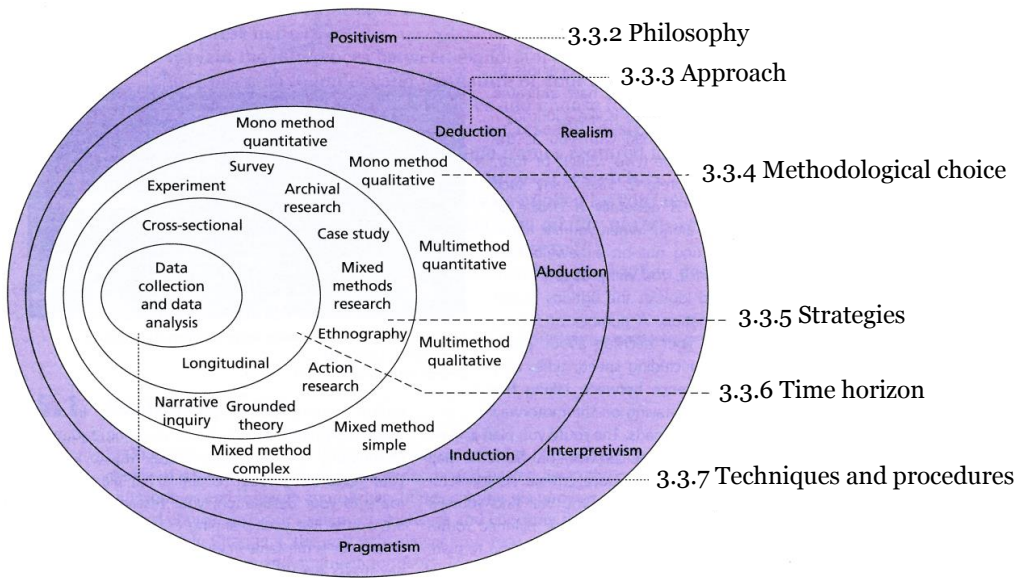


Figure 18: The research onion (adapted from Saunders, Lewis & Thornhill, 2012, p. 128)

3.3.2 Philosophy

Ontology is a branch of philosophy focusing on the nature of being, existence and reality (Hay, 2002; Biedenbach & Müller, 2011; Bryman & Bell, 2011; Robson, 2011; Easterby-Smith, Thorpe & Jackson, 2012; Saunders, Lewis & Thornhill, 2012). Ontology is a key aspect of research philosophy, as the nature of the focal phenomenon affects subsequent epistemological, axiological and methodological choices. Main ontological positions are *objectivism* and *subjectivism*.

A pragmatic ontological position was adopted in this research. This was necessary due to the objective and subjective properties of the focal phenomenon, the need to combine objective and subjective perspectives to address the research questions, and the practical nature of this research. Ontological pragmatism is a position which accepts various ways of interpreting the world and the science and philosophy of being. Ontological pragmatism calls for multiple views which best allow addressing the research question:

If the research question does not suggest unambiguously that a particular philosophy should be adopted, this confirms the pragmatist's view that it is perfectly possible to work with different philosophical positions. This reflects a theme... that multiple methods are often possible, and possibly highly appropriate, within one study. (Saunders, Lewis & Thornhill, 2012, p. 130)

Biedenbach and Müller (2011) noted ontological pragmatism has a minor presence in project management research, however, encourage researchers to state philosophical and methodological position, and "... move beyond the method debate in advancing to management science that is based on constructive debates instead of intolerance against the 'odd man'." (p. 99).

Epistemology is a branch of philosophy focusing on nature and scope of knowledge, and the ways of extending this knowledge in a field of study (Hay, 2002; Biedenbach & Müller, 2011; Bryman & Bell, 2011; Robson, 2011; Easterby-Smith, Thorpe & Jackson, 2012; Saunders, Lewis & Thornhill, 2012). Main epistemological positions are *positivism*, *realism* and *interpretivism*.

A pragmatic epistemological position was adopted in this research. This was necessary due to the practical nature of this research, the need to blend positivism and interpretivism, and my wish to avoid *paradigm wars* – the recurring philosophical debates involving competing paradigmatic schools of thought (Tashakkori & Teddlie, 1998) – "... a blood sport draining resources and energy and reducing communication, ultimately failing to advance any of the values of theory ..." (Suddaby, 2014, p. 409).

Epistemological pragmatism is a position which accepts various ways of understanding the science and philosophy of knowledge. Epistemological pragmatism calls for observable phenomena and subjective meanings to be integrated in ways which best allow addressing the research question as ...

(a) ... it gives us a paradigm that philosophically embraces the use of mixed method and mixed model designs, (b) because it eschews the use of metaphysical concepts (Trust, Reality) that have caused much endless (and often useless) discussion and debate, and (c) because it presents a very practical and applied research philosophy: Study what interests and is of value to you, study it in the different ways that you deem appropriate, and use the results in ways that can bring about positive consequences ... (Tashakkori & Teddlie, 1998, p. 30, brackets in original text)

Axiology is a branch of philosophy focusing on values (Heron, 1996; Saunders, Lewis & Thornhill, 2012). Axiology is often understood as relating to the fields of *ethics* – the concepts of *right* and *good* – and *aesthetics* – the concept of *beauty* and *harmony*, however, axiology also plays an important part in economics and in the foundation of social research: Axiology provides researchers understanding of the role the researchers' own values play in research procedures and research findings. Values guide and have an effect on all human action, including research. Aiming for credible research results, it is important to understand one's values, and the effects these values have when choosing a research topic, research questions, philosophical positions, and data collection and analysis methods.

Pragmatist research is influenced by values depending on the practical methods choices the researcher makes: The more subjective the pragmatist research, the larger the role values play in research and interpreting results. Emphasizing the need for axiological skill, Heron (1996) explains ...

... any inquiry with people about the human condition ideally presupposes they have articulated their shared values and guiding norms. These provide standards for the selection of inquiry topics and the conduct of the research, and, in transformative inquiries, for evaluating the practice which is the focus of the inquiry. (Heron, 1996, p. 127)

Building on Heron (1996), Saunders, Lewis and Thornhill (2012) suggest researchers provide a statement on their personal values relevant to the research topic. I follow this suggestion and declare I am a project management practitioner with over 20 years of experience from public and private sectors, several business areas, and Finnish and international organizations. I consider organizational project management methodologies a simple and effective way to address practical project management challenges.

3.3.3 Approach

An inductive research approach was adopted in this research. This was necessary due to the need to work bottom-up, and to achieve a thorough understanding of organizational project management methodologies, including their structures and contents, and the reasons why organizations use such methodologies.

Inductive research approach involves developing theory based on collected data (Bryman & Bell, 2011; Robson, 2011; Saunders, Lewis & Thornhill, 2012) in a procedure which can be characterized as *bottom-up*, proceeding from the particular toward the general. Inductive research has been, since the emergence of social sciences in the 20th century, favored by social scientists: Data – often qualitative – is collected to understand how individuals perceive their world, and theory is built on this understanding in a flexible way which allows proposing alternate explanations. Inductive research often involves seeking understanding of the context relating to the focal phenomenon, and studying small samples of respondents.

3.3.4 Methodological choice

Ketokivi and Choi (2014) proposed new definitions for qualitative and quantitative research: They defined qualitative research “... research approach that examines concepts in terms of their meaning and interpretation in specific contexts of inquiry” (p. 233) and quantitative research “... research approach that examines concepts in terms of amount, intensity, or frequency” (p. 233). These definitions were adopted for this research.

A sequential mixed method design – combining quantitative and qualitative data collection methods with quantitative and qualitative data analysis methods clearly sequentially, concurrently, or in dominant – less dominant mode (Tashakkori & Teddlie, 1998; Saunders, Lewis & Thornhill, 2012) – was adopted for this research: The first phase of this research comprised qualitative data collection with personal semi-structured interviewing of individual respondents. The second phase of this research comprised quantitative data collection with a survey – a questionnaire created from the results of the qualitative first phase of research – which was sent to 53 out of the original 57 individual respondents to complete. The third phase of this research comprised within-case and cross-case analyses of the collected qualitative and quantitative data. This sequential combination of qualitative and quantitative methods allowed collection and analyses of robust qualitative data, and collection and analyses of consistent quantitative data, allowing addressing of concerns relating to objectivity, reliability and validity of the methods used in data collection and analyses in this research.

3.3.5 Strategies

A combination of case study, mixed method, semi-structured interview, and questionnaire strategies was used in this research.

Case study

Case studies – mainly used for developing new theory (Barratt, Choi & Li, 2011) – study contemporary phenomena and the dynamics involved in single settings (Eisenhardt, 1989), in a “... duality of being *situationally grounded*, but at the same time, seeking a *sense of generality*” (Ketokivi & Choi, 2014, p.234, emphases in original text). Yin (1981) defines case studies as investigating “... (a) a contemporary phenomenon in its real-life context, especially when (b) the boundaries between phenomenon and context are not clearly evident.” (p. 59). Case studies “... are considered most appropriate as tools in the critical, early phases of new management theory, when key variables and their relationships are being explored” (Gibbert, Ruigrok & Wicki, 2008, p. 1465) and as they build a rich understanding of research context and focal phenomenon (Saunders, Lewis & Thornhill, 2012). Case studies may focus on a single case or many cases, use simple designs or embedded designs, and they may use quantitative, qualitative, or combinations of different methods of data collection and analysis (Eisenhardt, 1989; Stake, 1995; Yin, 2009; Barratt, Choi & Li, 2011).

Case study strategy was chosen for this research due to the potential for building new theory, the likelihood the process is free of researcher’s preconceptions and bias, the likelihood the emerging theory is testable, and the likelihood the resulting theory is empirically valid and connected to available evidence (Mintzberg, 1979a; Eisenhardt, 1989; Parkhe, 1993).

Case study weaknesses include tendency to produce overly complex theory, the possibility that the result from theory-building case study is narrow and idiosyncratic, the pragmatic backgrounds limiting possibilities to replicate theory-building case study research, the logistical challenges due to geographical distances, and the challenges with external validity and research reliability all theory-building strategies face (Eisenhardt, 1989; Parkhe, 1993). These weaknesses were addressed with careful research design and implementation.

Ketokivi and Choi (2014) set apart case studies for *theory generation* – building new theory inductively with empirical analysis, *theory testing* – testing existing theory deductively, and *theory elaboration* – conceptualizing the logic of existing theory to empirical context. Out of these three, this research is best characterized as *theory generation*.

Mixed methods

Mixed methods involve using combinations of quantitative and qualitative methods in the same research. Snow and Thomas (1994) noted multiple methods have been used widely in management research, for example in cases where interview results have been used to formulate subsequent questionnaire content:

The basic premise of the multimethod approach is that the particular limitations of a given method will be compensated by the counter-balancing strengths of another ... The use of multiple methods helps the researcher to be confident that observed variance between subjects is a product of subject attributes rather than of method. (Snow & Thomas, 1994, p. 464)

Mixed methods research – combining quantitative and qualitative data collection and analysis – is a manifestation of triangulation (Jick, 1979; Tashakkori & Teddlie, 1998). Rothbauer (2008) noted triangulation ...

... has come to mean a multimethod approach to data collection and data analysis. The basic idea underpinning the concept of triangulation is that the phenomena under study can be understood best when approached with a variety or a combination of research methods. Triangulation is most commonly used in data collection and analysis techniques, but it also applies to sources of data. (Rothbauer, 2008, p. 893)

Triangulation can be used in quantitative as well as qualitative research, and being a strategy for increasing the credibility of qualitative analysis, it can be considered an alternative to traditional criteria of reliability and validity. Mixed methods and other forms of triangulation, including data triangulation (Jick, 1979; Tashakkori & Teddlie, 1998) were used to increase the validity and reliability of this research.

Mixed method research strategy was selected for this research due to the available strengths, including the potential of combining data types for synergy benefits (Eisenhardt, 1989), the potential for compensating limitations of one method with the strengths of the other (Snow & Thomas, 1994), and their fit with the context, the motivation, and the research questions of this research.

Semi-structured interviews

Interviews allow in-depth examination of phenomenon, however, only second-hand data is available to researcher. Respondents need to be able to

talk about themselves, the attitudes and actions of others, events which have occurred in the past, and their own speculations about the future (Snow & Thomas, 1994): Interviews typically involve less interaction with focal phenomena and are likely to provide more objective knowledge than direct and participant observation, however, “In many field studies, interview data need to be combined with observational (and other) data to arrive at a valid characterization of the research problem” (p. 461). Interviews are well-suited for case studies, and for exploratory research aiming to understand a phenomenon (Shepherd, 2015). Kvale (1996) defined a semi-structured research interview as “... *an interview whose purpose is to obtain descriptions of the life world of the interviewee with respect to interpreting the meaning of the described phenomena*” (pp. 5 ... 6, emphasis in original text), and continued with a *miner metaphor* – knowledge is considered precious metal which the researcher is trying to unearth – and *traveler metaphor* – knowledge is considered the story the researcher can tell when returning home: This research followed the miner metaphor. Kvale concluded “... the interview as such is neither an objective nor a subjective method – its essence is intersubjective interaction” (p. 66).

Questionnaire

Questionnaires are efficient, however less flexible than observation and interviewing, often used when a large sample is required: Questionnaires can be considered structured written interviews sent to respondents or administered on-site. As with interviews, only second-hand data is available. Questionnaires are often used for high speed, low cost, easy data handling and ability to generate large volumes of data for statistical analyses (Snow & Thomas, 1994). The main setback with questionnaires is their low response rate, potential lack of respondent interest in the research subject, problems caused by the administering and collecting of the questionnaire, the structure of questionnaire, and incorrect questions which may reduce confidence in the research findings.

A combination of semi-structured interviews and questionnaire was used in this research due to their respective strengths, and the mutually corroborating, complementing, and reinforcing nature of qualitative data from semi-structured interviews and quantitative data from questionnaire: Semi-structured interviews have potential for in-depth examination of phenomena, for collecting anecdotal data which is required for building theories, ability to collect more objective knowledge than participant observation, and potential for collecting data free of researcher bias. The quantitative instrument was populated with main findings from qualitative interviews.

3.3.6 Time horizon

Cross-sectional time horizon refers to research in which temporal aspects are not of primary interest, and to research of a phenomenon at a particular point in time, sometimes referred to as a *snapshot* (Bryman & Bell, 2011; Saunders, Lewis & Thornhill, 2012).

Cross-sectional time horizon was selected for this research due to the available strengths, including the potential for providing an understanding of contemporary organizational project management methodologies, the suitability of cross-sectional time horizon considering the explorative nature of this research, and the fit with the context, motive and research questions of this research.

When project management methodologies have been researched to a greater extent, studies using the longitudinal time horizon are likely to provide interesting knowledge on how project management methodologies have evolved, what is the current status of project management methodologies, and how project management methodologies may be expected to develop in the future.

3.3.7 Techniques and procedures

Exploratory research focuses on new phenomena, known phenomenon in new light, and new phenomena in new light (Saunders, Lewis & Thornhill, 2012). Exploratory research is used for gaining an initial understanding of a phenomenon, especially when the exact nature of the situation or the problem is not known or understood before the research. Exploratory research is often flexible, and performed using unstructured or semi-structured interviews, relying on research participants' contribution toward understanding (Robson, 2011).

Descriptive research focuses on producing a precise account of phenomenon and the relevant organizations, events and contexts, such as what exactly is the phenomenon which takes place in certain organizations under certain circumstances. *Explanatory research* focuses on phenomena in order to explain relationships – typically causal relationships – between selected variables.

Exploratory techniques and procedures were followed in this research as scarce research into organizational project management methodologies had been performed previously, and as an explorative research design fit the context, motive and research questions of this research. When sufficient exploratory research has been performed, descriptive, and ultimately explanatory research techniques and procedures may be used.

3.4 Research process

This section describes the steps through which this research progressed.

3.4.1 Introduction

Professor Kathleen Eisenhardt introduced an inductive process for building theory from case study research in her paper *Building theories from case study research*, published in a special forum on theory building in *The Academy of Management Review* October 1989 issue. Eisenhardt (1989) considered her process “... highly iterative and tightly linked to data ... especially appropriate in new topic areas” (p. 532) and asserted “The resultant theory is often novel, testable, and empirically valid” (p. 532). Eisenhardt noted “... framebreaking insights, the tests of good theory (e.g., parsimony, logical coherence) and convincing grounding in the evidence are the key criteria for evaluating this type of research” (p. 532, brackets in original text). The Eisenhardt process was adopted and adaptively applied in this research, as it is well known, highly recognized, and fit the context of this research, including the identified research gap and the presented research questions. The Eisenhardt process for building theory from case study research is shown in Table 6.

The application of Eisenhardt’s research process in this research is explained in the following subsections:

3.4.2 Getting started

3.4.3 Selecting cases

3.4.4 Crafting qualitative instruments and protocols

3.4.5 Entering the field with qualitative methods

3.4.6 Crafting quantitative instruments and protocols

3.4.7 Entering the field with quantitative methods

3.4.8 Analyzing data

3.4.9 Enfolding literature

3.4.10 Reaching closure

Table 6: Process for building theory from case study research (Eisenhardt, 1989, p. 533)

Step	Activity	Reason
Getting Started	Definition of research question Possibly a priori constructs	Focuses efforts Provides better grounding of construct measures
Selecting Cases	Neither theory nor hypotheses Specified population	Retains theoretical flexibility Constrains extraneous variation and sharpens external validity
	Theoretical, not random, sampling	Focuses efforts on theoretically useful cases—i.e., those that replicate or extend theory by filling conceptual categories
Crafting Instruments and Protocols	Multiple data collection methods	Strengthens grounding of theory by triangulation of evidence
	Qualitative and quantitative data combined Multiple investigators	Synergistic view of evidence Fosters divergent perspectives and strengthens grounding
Entering the Field	Overlap data collection and analysis, including field notes	Speeds analyses and reveals helpful adjustments to data collection
	Flexible and opportunistic data collection methods	Allows investigators to take advantage of emergent themes and unique case features
Analyzing Data	Within-case analysis	Gains familiarity with data and preliminary theory generation
	Cross-case pattern search using divergent techniques	Forces investigators to look beyond initial impressions and see evidence thru multiple lenses
Shaping Hypotheses	Iterative tabulation of evidence for each construct	Sharpens construct definition, validity, and measurability
	Replication, not sampling, logic across cases	Confirms, extends, and sharpens theory
Enfolding Literature	Search evidence for “why” behind relationships	Builds internal validity
	Comparison with conflicting literature	Builds internal validity, raises theoretical level, and sharpens construct definitions
	Comparison with similar literature	Sharpens generalizability, improves construct definition, and raises theoretical level
Reaching Closure	Theoretical saturation when possible	Ends process when marginal improvement becomes small

Eisenhardt’s (1989) paper on building theory from case study research has been criticized, for example by Dyer and Wilkins (1991), for containing attributes of hypothesis testing despite being intended for building theory, for focusing on constructs and their measurability and missing out on the context and the rich backgrounds of each case, and for being introduced as a case study process despite encouraging the engaging of multiple cases. Dyer and Wilkins found that Eisenhardt’s “... approach is not likely to evoke as much new and better theoretical insights as have the ‘classic’ case studies ... If this hybrid approach becomes the standard, the theoretical progress of the field of management research may suffer” (Dyer & Wilkins, 1991, p. 613). Eisenhardt’s prompt response (Eisenhardt, 1991), in which she explains her position regarding the use of multiple cases, methodological rigor, and the tradeoff which Dyer and Wilkins see in between better stories and better constructs, appeared in the very same issue of *Academy of Management Review* the criticism appeared in. Despite the criticism, or perhaps because of it, Eisenhardt’s 1989 paper remains the most cited one in *The Academy of Management Review* – the most influential and cited journal in business and management research (Suddaby, 2014).

The mixed method research process used in this research, shown in Figure 19, was inspired by the Eisenhardt (1989) paper.

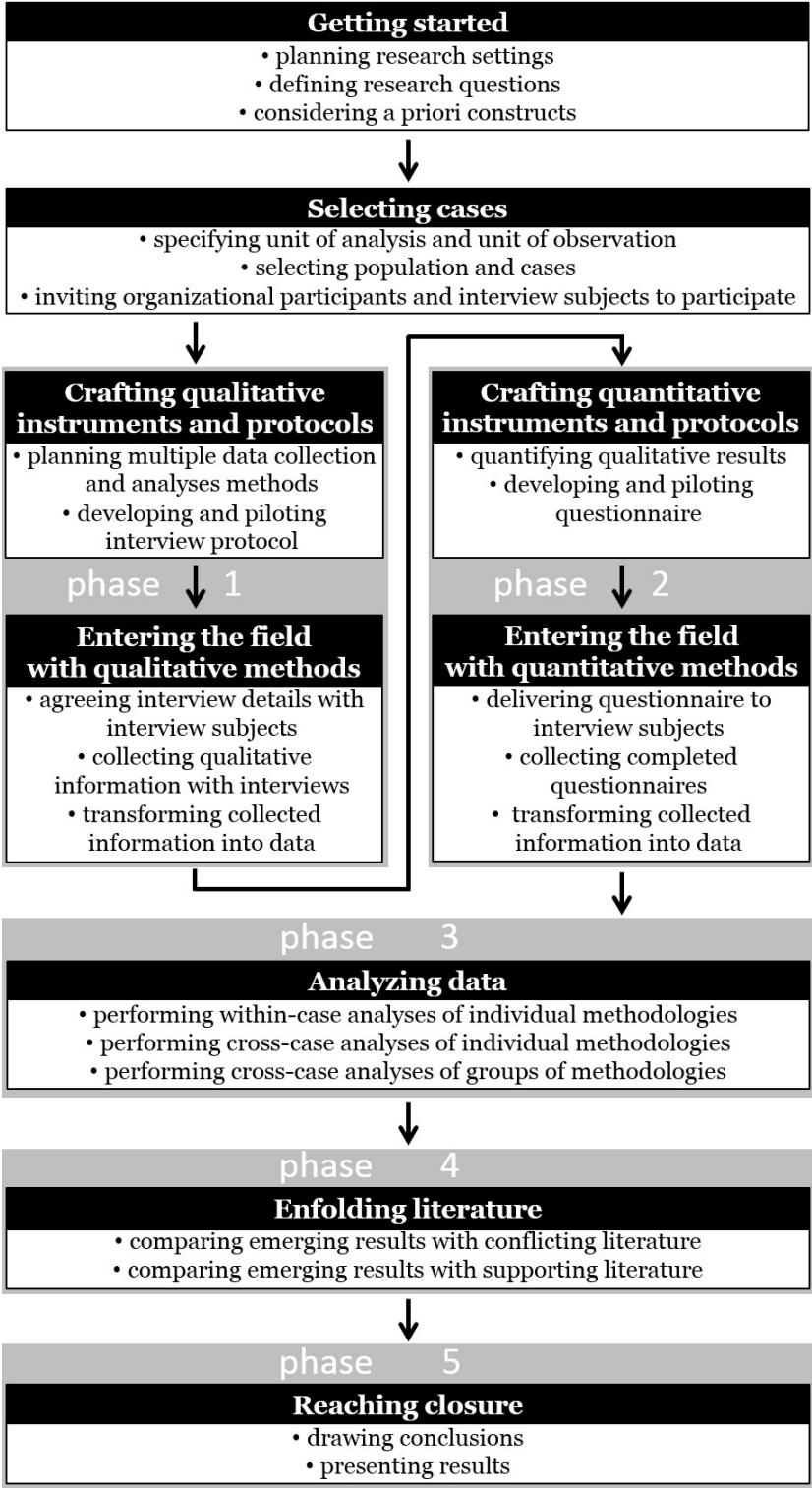


Figure 19: The research process used in this research (adapted from Eisenhardt, 1989, p. 533)

3.4.2 Getting started

Getting started – part of the preparations stage preceding main research phases – involved planning research settings, defining research questions and considering *a priori* constructs*. Research settings were defined by the context of this research. Defining research questions was necessary to focus efforts, to prevent collection of excessive volumes of unfocused data, and to allow the researcher consider the organizations to contact for participating in the research (Eisenhardt, 1989). Eisenhardt referred to Mintzberg (1979a) reflection of systematic nature of research: “No matter how small our sample or what our interest, we have always tried to go into organizations with a well-defined focus – to collect specific kinds of data systematically” (p. 585). Yin (2009) explained “The more a case study contains specific questions, the more it will stay within feasible limits” (p. 29). Eisenhardt encouraged considering constructs before entering the field, as constructs enable more accurate data collection. Initial research questions and constructs are, however, tentative: “No construct is guaranteed a place in the resultant theory, no matter how well it is measured. Also, the research questions may shift during the research” (Eisenhardt, 1989, p. 536).

Encouraging the definition of research questions and *a priori* constructs, Eisenhardt (1989) appears close to contradicting herself when she emphasizes the importance of starting theory-building research as close as possible to the ideal of having no theory to test and no hypothesis to consider:

Admittedly, it is impossible to achieve this ideal of a clean theoretical slate. Nonetheless, attempting to approach this ideal is important because preordained theoretical perspectives or propositions may bias and limit the findings. Thus, investigators should formulate a research problem and possibly specify some potentially important variables, with some reference to extant literature. However, they should avoid thinking about specific relationships between variable and theories as much as possible, especially at the outset of the process. (Eisenhardt, 1989, p. 536)

In this research the research settings and initial research questions were defined before case selection commenced. No formal constructs were defined *a priori*, however, the intention to investigate organizational project management methodologies by focusing on their structures and contents, and reasons why organizations use organizational project management methodologies was understood before case selection commenced.

* “Constructs are conceptual abstractions of phenomena that cannot be directly observed ... Constructs are not reducible to specific observations but, rather, are abstract statements of categories of observations” (Suddaby, 2010, p. 346)

3.4.3 Selecting cases

Selecting cases – part of the preparations stage preceding the main research phases – involved specifying the case, the unit of analysis, and the unit of observation, selecting the population from which the sample was to be drawn, and selecting the cases from the specified population.

When building theory from case study research, specifying the population defines the kinds of cases which can be selected for the research, and thus defines the limits to which the research results can be generalized (Eisenhardt, 1989). Theoretical sampling – as opposed to statistical sampling which is often used in hypothesis-testing research – from a chosen population is encouraged for theory-building case study research (Eisenhardt, 1989): Cases can be chosen to replicate previous research, to extend emerging theory, to fill conceptual categories or to serve as examples of polar extremes from within the specified population:

While the cases may be chosen randomly, random selection is neither necessary, nor even preferable ... given the limited number of cases which can usually be studied, it makes sense to choose cases such as extreme situations and polar types in which the process of interest is ‘transparently observable’. Thus, the goal of theoretical sampling is to choose cases which are likely to replicate or extend the emergent theory. (Eisenhardt, 1989, p. 537)

Eisenhardt (1989) described *diverse sampling* as strategy which allows building a model that is applicable across specified population: Cases are selected so they represent a broad range within the specified population, allowing generalization of results throughout chosen population. Theoretical sampling of cases limits statistical generalizability of research results, however, diverse sampling allows selecting cases purposefully to represent the specified population so that the findings have stronger foundation, and that the theoretical and practical contributions are applicable throughout the chosen population. Diverse sampling was used by Harris and Sutton (1986) in their study of dying organizations, and Gersick (1988) in her research of life-spans of naturally-occurring teams and group development.

Miles and Huberman (1994), Patton (2002) and Yin (2003) claimed *the case is the unit of analysis* in a case study, however, Grünbaum (2007) criticized what he considered “... a tautological relationship between ‘case’ and ‘unit of analysis’” (p. 83): Grünbaum asserted the unit of analysis and the case are not the same, but related concepts: “... the unit of analysis is a central concept in connection with understanding, preparing and implementing a case study” (p. 83) whereas the case is the major unit within which one or multiple units of analysis exist as shown in Figure 20.

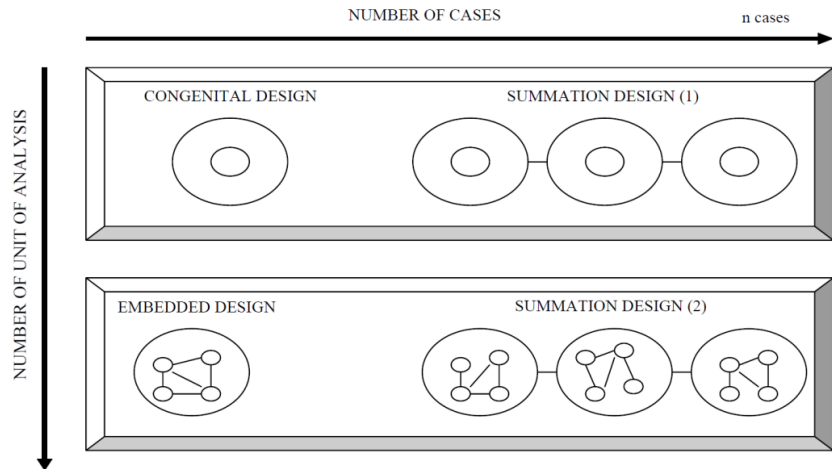


Figure 20: Four case study designs (Grünbaum, 2007, p. 87)

This research follows Grünbaum's assertion, and what he referred to as *summation design (1)* and described "... more cases, but only one unit of analysis in each case" (p. 87).

This research adopted a *project-based organization* as the case.

Unit of analysis, also known as *unit of investigation*, is the major entity – the *what* or the *who* – on which a scientific research focuses, and on which the researcher wants to be able to say something about at the end of the research (Patton, 2002; Grünbaum, 2007). Easterby-Smith, Thorpe and Jackson (2012) agreed, and defined unit of analysis as "The main level at which data is aggregated: can be individuals, groups, events, organizations, etc." (p. 347). This research adopted an *organizational project management methodology* as the unit of analysis. Wells (2012; 2013), similarly, used project management methodology as the unit of analysis.

Unit of observation, also referred to as *unit of data collection* (Yin, 2009), is the minor entity *through which* or *on which* data is collected in scientific research. This research adopted an *individual person* – a respondent working on, working with, or managing the work with an organizational project management methodology – as the unit of observation.

The selection of population for this research followed the motivation to gain a thorough understanding of organizational project management methodologies. This research was performed within a population of project-based organizations, each one employing project management as a part of their development, operations, and maintenance, and each one using an organizational project management methodology.

Eisenhardt (1989) recommended using extreme cases and polar opposites in multiple case studies attempting to build theory, and noted “... between 4 and 10 cases usually works well” (Eisenhardt, 1989, p. 545). Powell and Young (2004), Crawford and Pollack (2007), and Sauser, Reilly and Shenhar (2009) suggested investigating how contexts such as sector, national culture, and business area affect project management. A careful search for eight case organizations – four private organizations and four public ones, four Finnish organizations and four organization from outside Finland, and four organizations operating in Information and Communication Technology (ICT) business area and four organizations operating in other business areas – followed. The organizations were sought from the population of project-based organizations using an organizational project management methodology through diverse sampling: They represent a broad range of organizations within the specified population thus allowing the generalization of results throughout the sampled population.

The original invitation to participate in this research mentioned American, EMEA and APAC organizations, however, the final research design involved Finnish and international organizations. The final invitation to participate in this research is attached to this thesis as Appendix A.

A selection of potential organizational participants – fitting the contextual pattern and belonging in the chosen population – was contacted by emailing an invitation to participate in this research. Anticipating different rejection ratios, 10 Finnish organizations and 40 international organizations were contacted first. Six Finnish organizations quickly agreed to participate. The responses from international organizations were more tentative, and it was necessary to send a further 20 invitations before four international organizations agreed to participate in this research. Once an organization agreed to participate, a liaison – typically one of the developers or managers participating in the research as a respondent – was agreed to, and all communications were routed through this individual. Several case organizations requested for Non-Disclosure Agreements (NDAs) to be signed in order for them to participate in this research.

Despite the original plan to have four Finnish organizations participating in this research, six out of the ten contacted were interested, and participated in the first part of this research. One of the Finnish organizations withdrew from this research for reasons unrelated to this research after the first phase. In research with statistical sampling this might have posed a threat to research reliability, however, in theory-building case study research with theoretical sampling this is not a problem (Eisenhardt, 1989).

An introduction of the ten case organizations participating in this research is provided in section 3.2.

3.4.4 Crafting qualitative instruments and protocols

Crafting qualitative instruments and protocols – part of research phase 1 – involved planning data collection and analyses methods, and developing and piloting a case study protocol. Theory-building research typically combines several data collection methods to strengthen grounding and improve substantiation of research constructs and hypothesis through triangulation (Eisenhardt, 1989). Building theory from case study research is possible with qualitative data only and with quantitative data only (Eisenhardt, 1989; Yin, 2009), however, combining the two data types is recommended:

The combination of data types may be highly synergistic ... Quantitative evidence can indicate relationships which may not be salient to the researcher ... The qualitative data are useful for understanding the rationale or theory underlying relationships revealed in the quantitative data or may suggest directly theory which can then be strengthened by quantitative support. (Eisenhardt, 1989, p. 538)

Mintzberg (1979a) agreed with Yin and Eisenhardt, and noted ...

For while systematic data create the foundation for our theories, it is the anecdotal data that enable us to do the building. Theory building seems to require rich description, the richness that comes from anecdote. We uncover all kinds of relationships in our "hard" data, but it is only through the use of this "soft" data that we are able to "explain" them, and explanation is, of course, the purpose of research. (Mintzberg, 1979a, p. 587)

Jick (1979) further explained:

Different viewpoints are likely to produce some elements which do not fit a theory or model. Thus, old theories are refashioned or new theories developed. Moreover, as was pointed out, divergent results from multimethods can lead to an enriched explanation of the research problem. (Jick, 1979, p. 609)

Prior to entering the field, a *case study protocol*, also known as *interview guide* (Bryman & Bell, 2011; Robson, 2011) was created and piloted. The case study protocol included a list of themes and related open-ended questions to be covered in each interview, and was aimed at providing subtle standardization while allowing sufficient freedom and flexibility required for semi-structured interviewing. The case study protocol was enhanced based on the experiences from the interview pilot prior to commencing the main body of interviews. An anonymized copy of case study protocol used in this research is attached to this thesis as Appendix B.

3.4.5 Entering the field with qualitative methods

Entering the field with qualitative methods – part of research phase 1 – involved agreeing interview details with respondents, collecting information with semi-structured interviews, and transforming the information into data. Information analysis in parallel with on-going information collection allows researchers a jump start in information analysis, a preview into the emerging research findings, and a possibility to alter information collection procedure – by focusing on emerging themes, taking advantage of special opportunities, and adding questions as necessary (Eisenhardt, 1989). Eisenhardt reflected on the legitimacy of altering an on-going information collection:

These alterations create an important question: Is it legitimate to alter and even add data collection methods during a study? For theory-building research, the answer is ‘yes,’ because investigators are trying to understand each case individually and in as much depth as is feasible. The goal is not to produce summary statistics about a set of observations. Thus, if a new data collection opportunity arises or if a new line of thinking emerges during the research, it makes sense to take advantage by altering data collection, if such an alteration is likely to better ground the theory or to provide new theoretical insight. (Eisenhardt, 1989, p. 539)

The qualitative information collection involved inviting each identified respondent to a personal, face-to-face interview at a time and place suitable to the respondent. Despite the intention of arrange all interviews face-to-face, ten interviews were conducted online following a specific request by the organizational liaison or by an individual respondent.

Each interview comprised a short introductory discussion, the main interview, and a post-interview discussion. In the introductory discussion the respondents were provided a brief description of this research, an assurance the interview and the resulting data will be treated confidentially and anonymously, an assurance the collected information will not be disclosed or used for purposes other than this research without the respondent’s permission, a copy of the invitation to participate in this research, and the interviewer’s business card containing full contact information. The importance of the respondent providing frank and sincere information during the interview was emphasized to each respondent. Each respondent was asked for a permission to record the main interview in order to ensure the accuracy of field notes taken during the interview.

In the main interview the case study protocol was followed flexibly to ensure all relevant topics were covered. Toward the end of the interview each

respondent was encouraged to bring up and discuss topics the respondent considered relevant to their organizational project management methodologies – especially ones which had not have come up in the interview so far – and anything else they were willing inquire, comment or make a statement about. All interviews were recorded, and field notes – an on-going self-annotation to understand the direction the information collection procedure was going in – were taken manually in order to capture the exact dialogue taking place, to collect all immediate thoughts based on the dialogue, to ensure information quality, and to avoid loss of information in case of technical malfunction or human error. Main research foci regarding the structures and contents used in the focal organizational project management methodology, and the reasons why the focal organizational project management methodology is used received appropriate attention towards the end of each interview. No need to alter the qualitative information collection procedure or the case study protocol came up during the interviews.

In the post-interview discussion the respondents were requested to address any further questions and provide further comments regarding the interview, the information collected, and this research in general. Each respondent was asked to complete a questionnaire in the second phase of this research as soon as the first phase was completed. All respondents agreed to this request.

Once all respondents representing a case organization had been interviewed, the collected qualitative information was transformed into data by writing a descriptive summary – in the form of within-case analysis, following the case study protocol structure – of the organizational project management methodology and the context in which it was currently used at the case organization. The descriptions were written trying to maintain as objective a position as possible, blending in all collected information as far as possible, trying to avoid introducing researcher's own values, preferences and ideas. Main research topics, including the structures and contents organizations use in organizational project management methodologies, and the reasons why organizations use organizational project management methodologies, were collected into summary tables indicating all individual replies by all respondents as suggested by Miles and Huberman (1994).

Once a descriptive summary of an organizational project management methodology was available, it was sent to the organizational liaison for checking. The compilations were edited as requested, mainly in cases in which the analyses contained business data the case organizations did not want to disclose, and in cases in which the descriptions unintentionally approached breaching organizational anonymity. The process of compiling qualitative information from several respondents representing a case or-

ganization into a descriptive summary is illustrated in Figure 21. Table 7 summarizes the qualitative information collection implemented in the first phase of this research. The within-case analyses of qualitative and quantitative data are presented in Chapter 4.

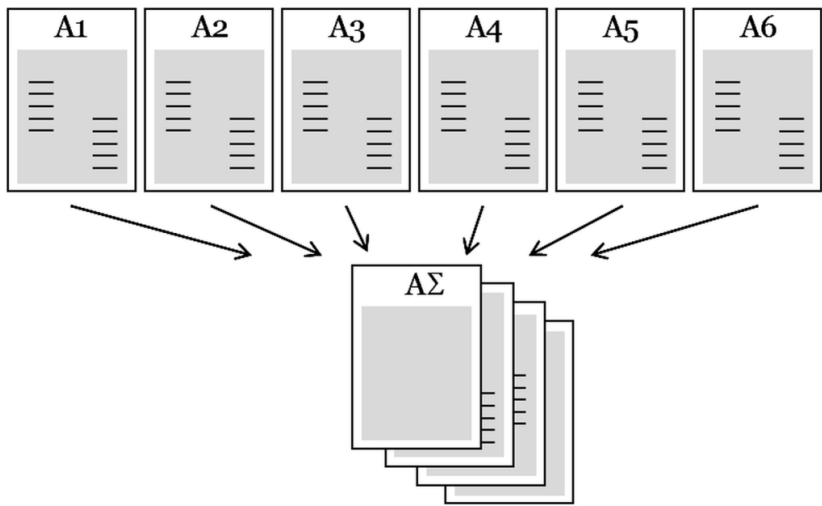


Figure 21: The principle of compiling a descriptive summary of an organizational project management methodology

Table 7: Summary of qualitative information collection implemented in this research

respondent	methodology role	interview date	interview time (h:min:s)	interview location
A1	developer	7.1.2013	1:22:15	Europe
A2	developer	29.1.2013	1:15:06	Europe*
A3	user	15.2.2013	58:01	Europe
A4	user	31.1.2013	1:05:40	Europe
A5	manager	8.2.2013	45:27	Europe
A6	manager	20.2.2013	1:20:51	Europe
B1	developer	23.11.2013	1:11:39	Europe
B2	user	28.1.2013	59:31	Europe*
B3	user	28.1.2013	55:26	Europe*
B4	user	18.2.2013	1:11:22	Europe
B5	manager	9.1.12013	1:48:34	Europe
B6	manager	27.2.2013	55:44	Europe
C1	developer	16.11.2012	40:40	North America*
C2	developer	19.12.2012	49:36	North America*
C3	user	28.11.2012	51:01	North America*

C4	user	11.12.2012	42:09	North America*
C5	manager	5.12.2012	41:22	North America*
C6	manager	11.12.2012	36:54	North America*
D1	developer	5.9.2012	54:44	Africa
D2	user	4.9.2012	1:15:25	Africa
D3	user	5.9.2012	37:26	Africa
D4	manager	3.9.2012	1:03:32	Africa
D5	manager	5.9.2012	52:50	Africa
E1	developer	15.10.2012	55:55	Europe
E2	developer	30.11.2012	51:25	Europe
E3	user	30.11.2012	47:01	Europe
E4	manager	30.11.2012	48:17	Europe
E5	manager	15.11.2012	43:11	Europe
E6	manager	2.11.2012	40:46	Europe
F1	developer	5.3.2013	1:06:00	Europe
F2	user	6.3.2013	50:41	Europe
F3	user	21.3.2013	1:16:36	Europe
F4	user	26.3.2013	1:04:44	Europe
F5	manager	28.2.2013	55:01	Europe
F6	manager	21.3.2013	48:16	Europe
F7	manager	25.3.2013	45:36	Europe
G1	developer	20.11.2012	1:18:42	Europe
G2	developer	21.11.2012	1:13:10	Europe
G3	user	22.11.2012	56:40	Europe
G4	user	22.11.2012	1:02:46	Europe
G5	manager	20.11.2012	46:05	Europe
G6	manager	20.11.2012	40:38	Europe
H1	developer	17.12.2012	53:13	Europe
H2	user	17.12.2012	47:33	Europe
H3	user	17.12.2012	38:42	Europe
H4	manager	11.12.2012	30:54	Europe*
H5	manager	17.12.2012	1:01:38	Europe
H6	manager	17.12.2012	52:33	Europe
I1	developer	8.11.2012	45:01	Europe
I2	user	8.11.2012	42:29	Europe
I3	user	8.11.2012	37:39	Europe
I4	manager	8.11.2012	40:27	Europe
I5	manager	8.11.2012	1:02:26	Europe
J1	user	12.12.2012	41:12	Europe
J2	user	12.12.2012	35:20	Europe
J3	manager	12.12.2012	59:54	Europe
J4	manager	12.12.2012	57:20	Europe

* indicates interviews conducted online instead of face-to-face

3.4.6 Crafting quantitative instruments and protocols

Crafting quantitative instruments and protocols – part of research phase 2 – involved developing a questionnaire based on the key interview results, and piloting it before main use. The key results from the qualitative part of this research were categorized in order to create a one-page questionnaire for sending to the respondents in the second phase of this research, as suggested by Miles and Huberman (1994): The main qualitative replies presented in the descriptive summaries were entered into two MS Excel worksheets as illustrated in Figure 22: One to determine how frequently specific organizational project management methodology structures and contents, and one to determine how frequently specific reasons why organizations use organizational project management methodologies were mentioned in the interviews. This allowed identification of unique patterns within each organizational project management methodology. Furthermore, this allowed most frequently mentioned organizational project management methodology structures and contents, and most frequently mentioned reasons why organizations use organizational project management methodologies to be identified. Due to the heterogenous nature of the qualitative data, most structures and contents, and reasons why organizations use organizational project management methodologies required a degree of adaptation in order to allow adoption into the quantitative research instrument.

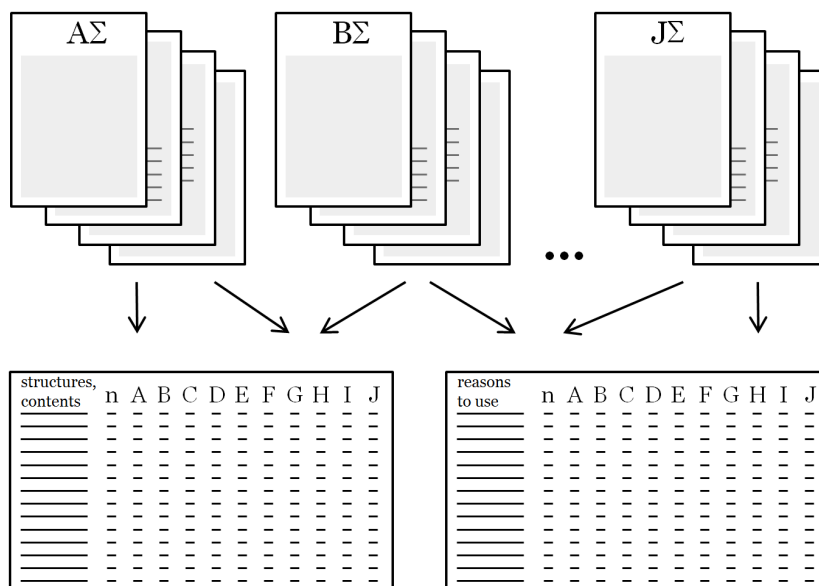


Figure 22: The principle of determining the most frequently mentioned structures and contents in organizational project management methodologies, and the most frequently mentioned reasons why organizations use organizational project management methodologies

From the 57 semi-structured interviews identified in Table 7, 399 specific replies to the question regarding organizational project management methodology structures and contents were coded onto the *structures, contents* worksheet, and categorized into 76 unique structures and contents. Respectively, 475 specific replies to the question regarding the reasons why organizations use organizational project management methodologies were coded onto the *reasons to use* worksheet, and categorized into 86 unique reasons. A one-page MS Word questionnaire sheet was created from the categorized data in the two worksheets as illustrated in Figure 23: The data in the *structures, contents* worksheet was split into structures and contents so that 27 most frequently mentioned reasons why organizations use organizational project management methodologies, 27 most frequently mentioned structures organizations use in organizational project management methodologies, and 27 most frequently mentioned contents organizations use in organizational project management methodologies were available for the questionnaire. 362 out of 399 – 91 % of individual responses on the *structures, contents* worksheet, and 342 out of 475 – 72 % of the individual responses on the *reasons to use* worksheet appear in the questionnaire. Creating the quantitative instrument from the two qualitative data tables required careful consideration and adaptation in order to achieve a logical and balanced questionnaire sheet.

The questionnaire sheet comprised three sections: One focusing on reasons why organizations use organizational project management methodologies, one focusing on structures organizations use in organizational project management methodologies, and one focusing on contents organizations use in organizational project management methodologies.

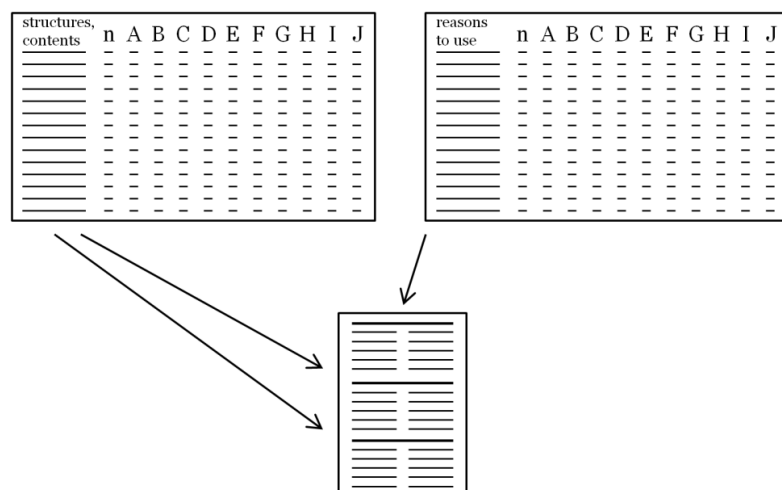


Figure 23: The principle of creating a one-page questionnaire from the qualitative findings


Each main section was headed by a question relevant to the section, followed by a list of the most frequently mentioned reasons, structures, and contents as identified in phase one of this research. The questionnaire sheet used in phase two of this research is shown in Table 8; the reasons, structures, and contents contained therein are explained briefly in Appendix E.

Table 8: The questionnaire sheet used in phase two of this research

How important are following reasons to use a project management methodology for your organization?			
	0	10	cannot answer
1) It provides a common way of working			
2) It recycles best practices and lessons learned			
3) It avoids "re-inventing the wheel"			
4) It enhances reaching of agreed targets			
5) It provides structure to projects			
6) It prevents chaos in projects			
7) It shows reputation and assists sales & marketing			
8) It enhances communications & information exchange			
9) It enhances reporting & information sharing			
10) It enhances organizational project management			
11) It develops project staff project management skills			
12) It enables quick "on-boarding" of new project staff			
13) It allows evaluating & comparing of project issues			
14) It enables exchanging and sharing of project staff			
15) It enhances risk management			
16) It enhances quality of project management			
17) It enhances quality of project deliverable			
18) It enhances keeping of customer promises			
19) It standardizes projects and provides consistency			
20) It enhances project (planning) effectiveness			
21) It enhances project (implementation) efficiency			
22) It provides common project language / vocabulary			
23) It optimizes use & management of project resources			
24) It enhances chances of project success			
25) It enhances cost management			
26) It enhances schedule management			
27) It eliminates project unpredictability & randomness			
Other (please specify):			
Other (please specify):			
Other (please specify):			

How important are following structures for your organizational project management methodology?			
	0	10	cannot answer
1) Project management structure			
2) Program management structure			
3) Portfolio management structure			
4) Product processes / connection to product processes			
5) Business processes / connection to business processes			
6) Phase – gate / stage – gate structure			
7) Modular methodology structure			
8) Scalable methodology (e.g. "light" & "standard")			
9) Choice of project life cycles (e.g. "waterfall" & "agile")			
10) Project (management) (complexity) evaluating system			
11) Tailorable / applicable structures and contents			
12) Standard (PRINCE2, PMI) methodology approach			
13) Methodology development & maintenance system			
14) Project staff training & on-boarding system			
15) Methodology use / project auditing system			
16) Best practices & lessons learned recycling system			
17) Reporting, communications & information system			
18) Experience & knowledge sharing system / events			
19) Project support (e.g. "master" & "apprentice") system			
20) Issue / risk / decision register system			
21) Customer feedback / satisfaction / care system			
22) Benefits tracking / management system			
23) Risk management system			
24) Schedule / time management system			
25) Cost / budget management system			
26) Quality management system			
27) Stakeholder management system			
Other (please specify):			
Other (please specify):			
Other (please specify):			

How important are following contents for your organizational project management methodology?			
	0	10	cannot answer
1) Document templates			
2) Process descriptions and guidelines			
3) Process diagrams			
4) Methodology framework ("big picture")			
5) Training materials and instructions			
6) Role definitions and descriptions			
7) Project minimum / compliance requirements			
8) Project (management) calculation sheets			
9) Project (management) checklists			
10) Project (management) dashboards			
11) Project management / methodology handbook / manual			
12) Project management / methodology quick guide			
13) Methodology tailoring / applying instructions			
14) Project management tools (or links thereto)			
15) Information on stakeholders and customers			
16) Health, safety and environmental materials			
17) Expected phase inputs and outputs			
18) Contracting / billing / invoicing materials & instr.			
19) Decision-making materials and instructions			
20) Change management materials and instructions			
21) Sales and marketing materials and instructions			
22) Resource planning materials and instructions			
23) Risk management materials and instructions			
24) Schedule / time management materials and instructions			
25) Cost / budget management materials and instructions			
26) Quality management materials and instructions			
27) Financing materials and instructions			
Other (please specify):			
Other (please specify):			
Other (please specify):			



totally irrelevant 1 2 3 4 5 6 7 8 9 10 extremely significant

(0 = not applicable / not employed in my organization)

Respondents were requested to complete the questionnaire based on their personal understanding and opinion using a ten-point numeric rating scale – with numbers from 1 to 10 – 1 referring to *totally irrelevant* and 10 to *extremely significant* as illustrated in Figure 24. The respondents were requested to mark a zero in the scoring column if a reason, a structure, or a content was not applicable or not used in their organization, and leave the scoring column blank and mark X in the adjacent *cannot answer* column instead in case they were unable to answer a question for any reason.

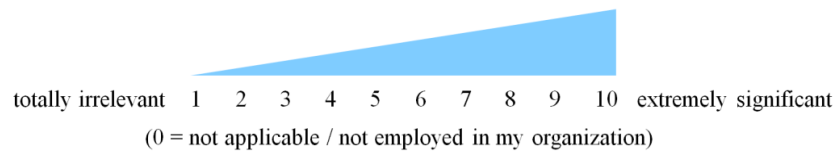


Figure 24: The numeric rating scale used in quantitative data collection in phase two of this research

This ten-point numeric rating scale – known as *self-anchoring rating scale* (Saunders, Lewis & Thornhill, 2012) – in which only the opposing ends are labeled and the respondents are allowed to use the scale of numbers between the opposite ends to provide responses to questions was used instead of a Likert-style rating scale, as the self-anchoring rating scale was considered more likely to provide objective results in a questionnaire of this type: Using a Likert-style rating scale would have required formulation of statements which would have likely introduced a positive or negative bias into the responses, thus jeopardizing objectivity.

The main questionnaire sheet was fitted with a one-page cover letter containing a short statement of appreciation for the respondents for participating in this research, a declaration emphasizing the importance of each respondent addressing all the questions as sincerely and candidly as possible, a reminder all collected data is processed confidentially and anonymously, the instructions for completing the questionnaire electronically or mechanically, and the instructions for returning the completed questionnaire. The cover sheet and the questionnaire sheet are attached to this thesis as Appendix C.

3.4.7 Entering the field with quantitative methods

Entering the field with quantitative methods – part of research phase 2 – involved delivering the questionnaire to respondents, collecting completed questionnaires from respondents, and transforming the collected quantitative information into data with simple statistical measures.

The questionnaire was delivered to all respondents participating in phase 2 of this research with individual personalized email messages. 53 emails were sent one after the other within a period of two hours. The first completed questionnaire was returned less than three hours later. After an initial period of two weeks a procedure of sending a weekly reminder to all respondents who had not returned a completed questionnaire was initiated. With this procedure, and the assistance of organizational liaisons, a completed questionnaire was received from all participating respondents. The last completed questionnaire was received almost 37 days after sending the original email. One respondent from organization **A** returned the completed questionnaire by mail for reasons not related to this research: An accurate survey receipt time is not available, and a turnaround time cannot be calculated for this respondent. Without organization **J** – which chose not to participate in phase 2 of this research for reasons not related to this research – the response rate is 100 %. If organization **J** is taken into calculation the response rate is 93 %.

Quantitative data analysis commenced when all respondents from all participating organizations had returned a completed questionnaire. The quantitative information from individual respondents were entered into a MS Excel worksheet, and transformed into data with basic statistical measures to allow integrating the quantitative data into the within-case analyses, and to allow performing the cross-case analyses of case organizations.

All quantitative data handling was performed in a MS Excel worksheet organized into three specific sections: One focusing on organizational project management methodology structures, one focusing on organizational project management methodology contents, and one focusing on reasons why organizations use organizational project management methodologies. The within-case and cross-case analyses of individual organizations were calculated automatically from entered quantitative information. The cross-case analyses of groups of organizational project management methodologies were calculated with basic calculation formulas which accessed the data belonging in various groups – for example private organizations against public ones as shown in Figure 25. Table 9 summarizes the quantitative information collection implemented in the second phase of this research.

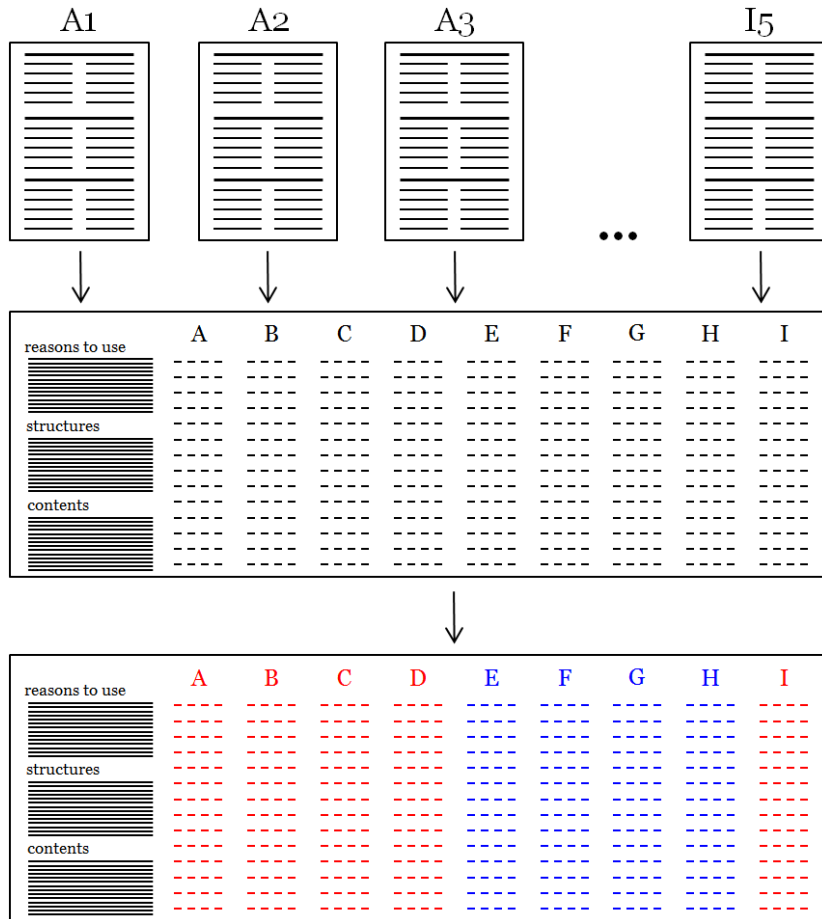


Figure 25: The principle of transforming quantitative information from individual respondents into quantitative data, and analyzing the quantitative data in this research. As an example, red color indicates private, and blue color public organizational data.

Table 9: Summary of quantitative information collection implemented in this research
 * A turnaround time cannot be calculated for respondent A6

respondent	methodology role	survey dispatch	survey receipt	turnaround time (d:h:min)
A1	developer	8.4.2013 17:46	15.5.2013 15:33	36:21:47
A2	developer	8.4.2013 17:54	18.4.2013 15:52	9:21:58
A3	user	8.4.2013 17:51	9.4.2013 9:10	0:15:19
A4	user	8.4.2013 17:52	10.4.2013 10:00	1:16:8
A5	manager	8.4.2013 17:41	16.4.2013 12:26	7:18:45
A6*	manager	8.4.2013 17:49	-	-
B1	developer	8.4.2013 18:07	18.4.2013 10:23	9:16:16
B2	user	8.4.2013 18:02	15.4.2013 16:35	6:22:33
B3	user	8.4.2013 18:09	19.4.2013 15:40	10:21:31
B4	user	8.4.2013 18:00	9.4.2013 11:11	0:17:11

B5	manager	8.4.2013 18:04	15.4.2013 16:59	6:22:55
B6	manager	8.4.2013 18:05	19.4.2013 14:37	10:20:32
C1	developer	8.4.2013 18:17	10.4.2013 1:12	1:6:55
C2	developer	8.4.2013 18:15	11.4.2013 15:38	2:21:23
C3	user	8.4.2013 18:12	8.4.2013 21:04	0:2:52
C4	user	8.4.2013 18:22	29.4.2013 16:33	20:22:11
C5	manager	8.4.2013 18:14	15.4.2013 18:28	7:0:14
C6	manager	8.4.2013 18:20	20.4.2013 1:25	11:7:5
D1	developer	8.4.2013 18:27	15.4.2013 16:48	6:22:21
D2	user	8.4.2013 18:32	9.4.2013 10:02	0:15:30
D3	user	8.4.2013 18:30	9.4.2013 10:42	0:16:12
D4	manager	8.4.2013 18:24	8.4.2013 23:41	0:5:17
D5	manager	8.4.2013 18:28	9.4.2013 9:58	0:15:30
E1	developer	8.4.2013 18:35	30.4.2013 9:07	21:14:32
E2	developer	8.4.2013 18:38	22.4.2013 9:25	13:14:47
E3	user	8.4.2013 18:41	18.4.2013 16:33	9:21:52
E4	manager	8.4.2013 18:33	15.4.2013 13:18	6:18:45
E5	manager	8.4.2013 18:39	30.4.2013 10:14	21:15:35
E6	manager	8.4.2013 18:36	16.4.2013 8:54	7:14:18
F1	developer	8.4.2013 18:49	12.4.2013 16:45	3:21:56
F2	user	8.4.2013 18:50	26.4.2013 13:43	17:18:53
F3	user	8.4.2013 18:54	22.4.2013 7:18	13:12:24
F4	user	8.4.2013 18:53	29.4.2013 12:40	20:17:47
F5	manager	8.4.2013 18:46	11.4.2013 15:36	2:20:50
F6	manager	8.4.2013 18:47	12.4.2013 14:44	3:19:57
F7	manager	8.4.2013 18:51	12.4.2013 14:41	3:19:50
G1	developer	8.4.2013 19:10	24.4.2013 11:13	15:16:3
G2	developer	8.4.2013 19:11	7.5.2013 12:36	28:17:25
G3	user	8.4.2013 19:17	30.4.2013 0:50	21:5:33
G4	user	8.4.2013 19:15	23.4.2013 15:44	14:20:29
G5	manager	8.4.2013 19:13	22.4.2013 9:48	13:14:35
G6	manager	8.4.2013 19:08	6.5.2013 16:33	27:21:25
H1	developer	8.4.2013 19:00	22.4.2013 10:43	13:15:43
H2	user	8.4.2013 19:04	10.4.2013 0:36	1:5:32
H3	user	8.4.2013 19:06	24.4.2013 13:59	15:18:53
H4	manager	8.4.2013 18:56	16.4.2013 10:00	7:15:4
H5	manager	8.4.2013 19:02	29.4.2013 19:21	21:0:19
H6	manager	8.4.2013 18:58	9.4.2013 12:39	0:17:41
I1	developer	8.4.2013 19:22	16.4.2013 8:31	7:13:9
I2	user	8.4.2013 19:21	9.4.2013 10:32	0:15:11
I3	user	8.4.2013 19:19	9.4.2013 10:30	0:15:11
I4	manager	8.4.2013 19:27	29.4.2013 9:56	20:14:29
I5	manager	8.4.2013 19:24	17.4.2013 9:04	8:13:40

3.4.8 Analyzing data

Analyzing data – research phase 3 – involved with-in and cross-case analyses of collected qualitative and quantitative data.

Miles and Huberman (1994) resent the loss of connection between data and results:

We are left with the researcher's telling us of classifications and patterns drawn from the welter of field data, in ways that are irreducible or even incommunicable. We do not really see how the researcher got from 3,600 pages of field notes to the final conclusions, as sprinkled with vivid illustrations as they may be. (Miles & Huberman, 1994, p. 2)

The data analyses were performed in such ways that the connection between collected data, findings, and research results would remain visible.

Within-case analyses allows a researcher present first-hand research results, become intimately acquainted with each case, and cope with the enormous amount of data resulting from theory-building case study research – especially when multiple cases are involved and when research questions are open ended: “Within-case analyses typically involves detailed write-ups for each site. These write-ups are often simply pure descriptions, but they are central to the generation of insight ... the overall idea is to become intimately familiar with each case” (Eisenhardt, 1989, p. 540). In this research the within-case analyses comprised descriptions of organizational project management methodologies, with tabulated displays of collected data.

Cross-case analyses enable a researcher identify patterns by viewing data from different perspectives, and prevent premature – even faulty – conclusions based on an incomplete understanding and possible biases. Eisenhardt (1989) mentioned three cross-case tactics: Selecting categories of cases and identifying within-group similarities and intergroup differences, selecting groups of cases and identifying similarities and differences between the two groups, and dividing the data by data source:

... the idea behind these cross-case searching tactics is to force investigators to go beyond initial impressions, especially through the use of structured and diverse lenses on the data. These tactics improve the likelihood of accurate and reliable theory, that is, a theory with a close fit with the data. (Eisenhardt, 1989, p. 541)

In the cross-case analyses the collected qualitative and quantitative data were analyzed in order to identify the most common and the most important structures, contents, and reasons why organizations use organizational project management methodologies, as well as similarities and differences between the methodologies.

3.4.9 Enfolding literature

Enfolding literature – research phase 4 – involved comparing emerging research findings to broad ranges of contradicting and supporting literature: Comparisons with contradicting literature sharpen established constructs, enhance research internal validity and raise the theoretical level of the research findings, while comparisons with supporting literature increase generalizability, enhance construct definitions and raise the theoretical level of the research findings. Comparing the research findings – emerging concepts, theory or hypotheses – to contradicting and supporting literature is an important part of building theory from case study research, and involves investigating extant literature which aligns with the research result, extant literature which contradicts the research findings, and seeking understanding why this is the case (Eisenhardt, 1989).

Comparing the research findings to contradicting literature forces the researcher to seek further understanding in order to maintain confidence in the research findings, and more importantly, opens a way to a more creative, innovative and understanding-seeking mindset than the researcher would likely achieve without contradictory materials: “The result can be deeper insight into both the emergent theory *and* the conflicting literature, as well as sharpening of the limits to generalizability of the focal research” (Eisenhardt, 1989, p. 544, emphasis in original text).

Comparing the research findings to supporting literature allows identifying similarities and associations with phenomena which are not usually connected to the focus of the research, and results in enhanced internal validity, wider generalizability and enhanced conceptual level. Eisenhardt (1989) concluded ...

Overall, tying the emergent theory to existing literature enhances the internal validity, generalizability, and theoretical level of theory building from case study research. While linking results to the literature is important in most research, it is particularly crucial in theory-building research because the findings often rest on a very limited number of cases. In this situation, any further corroboration of internal validity or generalizability is an important improvement. (Eisenhardt, 1989, p. 545)

The literature relevant to this study was reviewed after the within-case and cross-case analyses. The research findings were compared to the main findings of the literature review in order to understand whether, how, and why the findings of this research corroborate or contradict the extant literature on project management methodologies.

3.4.10 Reaching closure

Reaching closure – research phase 5 – involved considering when to stop adding more cases to research and when to stop comparative iterations between research findings and data, presenting findings and drawing conclusions. Ideally, researchers should add new cases to research until theoretical saturation – the position in which adding more cases to the research does not reveal any new knowledge – is reached and continue the comparative iterations between theory and data until a position is reached in which adding more iterations to enhance the emerging theory does not produce any further refinements. In practice, researchers are bound by temporal and monetary constraints, which limit the number of cases which can be investigated in a single research setting, and the number of comparative iterations which can be performed between theory and data (Eisenhardt, 1989).

Instead of aiming for theoretical saturation, researchers often decide the number of cases in advance, taking available resources, time, anticipated research design, and potential research participants into consideration:

... while there is no ideal number of cases, a number between 4 and 10 cases usually works well. With fewer than 4 cases, it is often difficult to generate theory with much complexity, and its empirical grounding is likely to be unconvincing, unless the case has several mini-cases within it ... With more than 10 cases, it quickly becomes difficult to cope with the complexity and volume of data. (Eisenhardt, 1989, p. 545)

Similarly, researchers conclude comparative iterations when it becomes clear new contributions from further comparisons are unlikely:

The final product of building theory from case studies may be concepts ... a conceptual framework ... or propositions or possibly mid-range theory ... On the downside, the final product may be disappointing. The research may simply replicate prior theory, or there may be no clear patterns within the data. (Eisenhardt, 1989, p. 545)

In this research the plan to was to study eight organizational project management methodologies, however, due to the Finnish interest in this research ten organizational project management methodologies were investigated in the first phase of this research, and nine organizational project management methodologies in the second phase of this research. Several rounds of comparative iteration between the data, the findings, the conclusions, and the literature were made before arriving at the findings in Chapter 4 and Chapter 5, and the conclusions in Chapter 6.

4. Within-case analyses

This chapter presents the within-case analyses of the organizational project management methodologies investigated in this research.

4.1 Introduction

The organizational project management methodologies investigated in this research were analyzed within-case in order to manage the large volume of data collected from the respondents, and to become intimately acquainted with each individual case.

This chapter contains an introduction and ten main sections. The main sections are:

4.2 ... 4.11 Case organization **A ... J**

The within-case analysis of each case includes several descriptive subsections, a subsection on the structures and contents the organization currently uses in its organizational project management methodology, and a subsection on the reasons why the organization currently uses an organizational project management methodology.

Chapter 5 presents the cross-case analyses of organizational project management methodologies. Chapter 6 presents the discussion and conclusions drawn from the findings from the within-case and cross-case analyses.

4.2 Case organization A

4.2.1 A's context and connection to projects and project management

A is a private business organization, headquartered in Finland, operating in the ICT business area. A provides ICT products, services, and project deliveries to a range of customers in the public and private sectors, and in a variety of business areas by delivering and working with in-house, customer, and third party systems comprising both hardware and software. A is one of the leading Finnish operators in the focal business area. At the time of the interviews A's project portfolio contained several hundred projects having a total combined budget of several hundred million euro.

A is a project-based organization as projects, project management, and project-based control are central to A's business. A has established an expanding network of suppliers, contractors, partners, clients, and customers within which it operates. A offers a wide range of ICT products and services, mainly developed and maintained as projects, as well as a significant volume of project deliveries and services to A's in-house and external partners, clients, and customers. A's organizational project management methodology, system engineering methodology, and program management methodology comprise the core of A's organizational way of working. A's organizational project management methodology is considered central for A's business and A's internal operations. One of the respondents explained *"Projects and project management are central to A. A has even implemented project-based control of business operations"*.

4.2.2 A's organizational project management methodology history

A's organizational project management methodology development was initiated in the early 1980s when several A's business units began developing systematic ways of organizing project work. Several competing methodology start-ups were allowed to operate in parallel until one was chosen over the others and selected as the one common way of working to be deployed throughout the organization. A's organizational project management methodology took a major step forward when A merged with another major ICT organization in the late 1990s. A's management decided to adopt the organizational project management methodology from the merger partner, and to adapt it to A's organizational context in order to establish a common way of working, to enhance project management quality, and to increase project throughput. The tailoring of A's organizational project management methodology, started at the 1990s merger, has continued, and the organizational

project management methodology has been fitted with structures and contents to enhance its performance. A's organizational project management methodology currently includes a five sub-process phase/gate structure built on a PMI PMBOK Guide project management methodology foundation, focusing on project management as opposed to program management, portfolio management, or product related processes.

Subsequent to the 1990s merger A productized the organizational project management methodology of the merger partner, and released it as a generic commercial project management methodology. This generic variant of A's organizational project management methodology has been licensed to over 100 external organizations.

At the time of the interviews A's organizational project management methodology had started to receive criticism for being complex, bureaucratic, and difficult to navigate, and for *not* being as flexible as A's project management staff would prefer. A was considering a *return to basics* by simplifying methodology structures, reducing methodology contents, and taking the methodology in the direction of the generic productized methodology variant which the project management staff found more straightforward to use.

4.2.3 Using and maintaining A's organizational project management methodology

It is mandatory to follow A's organizational project management methodology when project plans indicate a predetermined set of effort and budget thresholds will be exceeded. If project plans indicate that these effort and budget thresholds will *not* be exceeded, project management staff has greater flexibility to adaptively apply the methodology. A's project managers are expected to describe the proposed ways of applying the organizational project management methodology in project plans, and negotiate for authority approvals regarding the proposed ways of implementing projects.

A's organizational project management methodology intention is to provide guidance and support so that project management staff can learn from the practical knowledge, including feedback, best practices, and lessons learned, submitted from similar projects. Project management staff is encouraged to adaptively apply the methodology instead of blindly following it, however, the mandatory steps project management staff must take, if project plans indicate the agreed set of effort and budget thresholds will be exceeded, must be followed as instructed. A's project management staff is expected to apply common sense when planning how to adaptively apply the methodology according to specific project needs.

A's organizational project management methodology is developed and maintained through a continuous process of monitoring advances in project management research, following new materials released by independent authors and national as well as international organizations, performing gap analysis between expected and actual results, and collecting feedback, best practices, lessons learned, and new ideas from project management staff. These inputs are followed and used when deciding on major methodology updates and minor enhancements to methodology structures and contents. Major methodology updates are implemented in A's international development centers and released semiannually. Minor methodology updates, enhancements, and fine tuning are implemented in an informal fashion, and released as required between the major updates. A's organizational project management methodology development and maintenance procedures are governed by the project management process owner and the process manager.

4.2.4 Experiences from A's organizational project management methodology

A's organizational project management methodology is highly detailed in both structure and content. A uses several auditing systems which are set to monitor how and to what extent the methodology is followed, some of which connect to the staff bonus system. These features sometimes create feelings among the project management staff of being micro-managed through the methodology.

A's organizational project management methodology fits the organizational needs, and is successful in providing the benefits the organization expects. The feedback from project management staff, however, indicates the methodology is sometimes considered overly complex and bureaucratic, and that it does not always allow sufficient flexibility to apply the methodology according to specific project needs. A return back to basics is under consideration at A. While historical improvements have focused on improving the methodology, future improvements will also need to consider effective methodology rollouts and launches. One of the respondents concluded *"Getting over blaming the process, and the not-invented-here syndrome remain the two main challenges for [A's] organizational project management methodology"*.

4.2.5 Structures and contents currently used in A's organizational project management methodology

A's respondents were asked about the structures and contents currently used in A's organizational project management methodology. The individual replies are shown in Table 10 in the order they were given.

Table 10: Individual qualitative replies from A's respondents to the question regarding what structures and contents are currently used in A's organizational project management methodology. Bold typeface and colors matching the ones in Table 11 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one A's respondent only.

A1 methodology developer	A2 methodology developer	A3 methodology user	A4 methodology user	A5 methodology manager	A6 methodology manager
1 document templates & tools	1 process guides, methods & descriptions	1 process descriptions	1 document templates	1 document templates	1 process descriptions
2 process descriptions	2 document tools & tem- plates	2 risk manage- ment	2 instructions	2 process descriptions	2 decision- making points
3 project man- agement tools	3 document tools & tem- plates	3 change man- agement	3 checklists	3 role descrip- tions	3 framework
4 control point: checklists	4 checklists	4 checklists	4 roles, respon- sibilities & au- thorities	4 resource plan- ning	4 document templates
5 dashboard	5 role descrip- tions	5 know-how	5 process dia- grams	5 billing	5 checklists
6 customer feed- back system	6 sales materials	6 requirements	6 process descriptions	6 checklists	6 links to organ- ization project management tool
	7 further info for specific pur- poses	7 templates		7 organization project man- agement tool	7 acceptance criteria

39 individual replies – a mean of 6.5 per person – were provided by A's respondents, and categorized in order to identify the features unique to A. A categorized summary of the structures and contents currently used in A's organizational project management methodology is shown in Table 11.

Table 11: Categorized qualitative summary of the structures and contents currently used in A's organizational project management methodology in a decreasing order of n_A , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 10 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one A's respondent only.

structures and contents currently used in A's organizational project management methodology	n_A
process descriptions/guidelines	7
document templates and tools	6
project (control point) checklists	6
project management tools/links thereto	3
role definitions/descriptions	3
process diagram/framework	2
change management tools/systems	1
project dashboard	1
risk management processes & tools	1
billing/invoicing system	1
project phase inputs and outputs	1
customer feedback/satisfaction/care system	1
decision making points/structures	1
sales materials	1
further info for specific purposes	1
know-how requirements	1
resource planning	1
acceptance criteria	1

The most frequently mentioned component appears seven times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in A's organizational project management methodology – *process descriptions/guidelines*, *document templates and tools*, and *project (control point) checklists* – were mentioned 19 times: 48,7 % of A's replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

A's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for A on a 1-to-10 rating scale (1 referring to *totally irrelevant*, 10 to *extremely significant*). A summary of the responses is shown in Table 12.

Table 12: Summary of A's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_A , the mean of received responses. n_A denotes the number of responses received, and SD_A the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_A	M_A	SD_A
project management structure	6	9,67	0,75
phase - gate/stage - gate structure	6	9,00	1,15
program management structure	5	9,00	1,10
scalable methodology (e.g. "light" & "standard")	6	8,83	1,07
experience & knowledge sharing system/events	6	8,83	1,07
cost/budget management system	6	8,83	1,07
schedule/time management system	6	8,83	1,07
business processes/connection to business processes	6	8,67	1,25
best practices & lessons learned recycling system	6	8,50	1,38
reporting, communications & information system	6	8,33	0,75
quality management system	6	8,17	0,69
customer feedback/satisfaction/care system	6	8,17	2,11
standard (PRINCE2/PMI) methodology approach	6	8,17	0,37
tailorable/applicable structures & contents	6	8,00	1,15
methodology development & maintenance system	5	8,00	0,63
portfolio management structure	5	8,00	1,41
risk management system	6	7,83	2,41
modular methodology structure	6	7,83	0,90
project staff training & on-boarding system	5	7,80	0,98
project support (e.g. "master" & "apprentice") system	4	7,75	0,83
stakeholder management system	6	7,67	1,11
product processes/connection to product processes	4	7,50	1,50
issue/risk/decision register system	6	7,33	1,49
methodology use/project auditing system	6	7,33	1,11
choice of project life cycles (e.g. "waterfall" & "agile")	6	7,17	2,79
project (management) (complexity) evaluating system	5	6,80	0,75
benefits tracking/management system	5	6,40	2,06

n_A ranges from 4 for *project support (e.g. "master" & "apprentice") system* and *product processes/connection to product processes* up to 6 for most other presented structures. M_A ranges from 6.40 for *benefits tracking/management system* up to 9.67 for *project management structure*. SD_A ranges from 0.37 for *standard (PRINCE2/PMI) methodology approach* up to 2.79 for *choice of project life cycles (e.g. "waterfall" & "agile")*.

A's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for A on a 1-to-10 rating scale (1 referring to *totally irrelevant*, 10 to *extremely significant*). A summary of the responses is shown in Table 13.

Table 13: Summary of A's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_A , the mean of received responses. n_A denotes the number of responses received, and SD_A the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_A	M_A	SD_A
process descriptions and guidelines	6	9,33	0,75
document templates	6	9,33	0,94
change management materials and instructions	6	9,17	0,69
project management tools (or links thereto)	6	9,00	1,00
project minimum/compliance requirements	6	8,67	1,37
role definitions and descriptions	6	8,67	0,94
expected phase inputs and outputs	6	8,67	0,75
methodology framework ("big picture")	5	8,60	0,80
schedule/time management materials and instructions	6	8,50	1,26
cost/budget management materials and instructions	6	8,50	1,71
process diagrams	6	8,17	1,46
risk management materials and instructions	6	8,17	1,57
contracting/billing/invoicing materials & instructions	6	8,17	1,67
project (management) calculation sheets	6	8,17	1,57
training materials and instructions	6	8,00	1,15
financing materials and instructions	6	8,00	1,41
sales and marketing materials and instructions	6	8,00	2,08
methodology tailoring/applying instructions	6	7,83	0,69
quality management materials and instructions	6	7,83	1,34
project (management) dashboards	6	7,83	1,77
project (management) checklists	6	7,83	1,34
decision-making materials and instructions	6	7,67	1,80
resource planning materials and instructions	6	7,67	2,13
information on stakeholders and customers	6	7,67	0,94
project management/methodology handbook/manual	6	7,50	1,12
project management/methodology quick guide	6	6,83	1,07
health, safety and environmental materials	5	6,00	1,41

n_A ranges from 5 for *methodology framework ("big picture")* and *health, safety and environmental materials* up to 6 for most other presented contents. M_A ranges from 6.00 for *health, safety and environmental materials* up to 9.33 for *process descriptions and guidelines* and *document templates*. SD_A ranges from 0.69 for *change management materials and instructions* and *methodology tailoring/applying instructions* up to 2.13 for *resource planning materials and instructions*.

4.2.6 Reasons why A currently uses an organizational project management methodology

A's respondents were asked about the reasons why A currently uses an organizational project management methodology. The individual replies are shown in Table 14 in the order they were given.

Table 14: Individual qualitative replies from A's respondents to the question regarding reasons why A currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 15 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one A's respondent only.

A1 methodology developer	A2 methodology developer	A3 methodology user	A4 methodology user	A5 methodology manager	A6 methodology manager
1 it enhances business forecasting	1 it provides project management framework	1 it emphasizes role of project manager	1 it supports project managers' work	1 it ensures project staff knowledge	1 it enhances consistency of project quality
2 it enhances business forecasting quality	2 it provides common way of working	2 it provides common way of working in projects	2 it enables new project staff on-board	2 it provides common way of working	2 it enables keeping customer promise
3 it enhances identifying & managing business risk	3 it enables decentralized way of working despite cultural, organizational & geographic differences	3 it provides common way of reporting	3 it provides quality consistency	3 it ensures high quality delivery according to contract	3 it reminds project staff what to do
4 it enhances keeping customer promise	4 it demonstrates same way of working to clients and customers	4 it provides common way of working in steering groups and as project owners	4 it provides common way of working	4 it ensures consistent quality	4 it enhances project efficiency & effectiveness
5 it enhances project management in general	5 it enhances chances of project success	5 it enables exchanging project personnel as/if required	5 it recycles best practices and avoids reinventing wheel	5 it provides structure, prevents organizational chaos	5 it provides common (harmonized) way of working
6 it enables decentralized way of working	6 it provides good way of working required for certification & auditing (e.g. CMMI)	6 it avoids reinventing the wheel	6 it enables experience sharing	6 it demonstrates appropriate method of working to achieve organizational quality targets	6 it supports project marketing & sales
7 it provides common way of working	7 it enables exchanging project staff as/if required	7 it enhances co-operation between different cultures	7 it ensures best practices and lessons learned are not forgotten		7 it avoids reinventing wheel
8 it avoids reinventing the wheel		8 it provides common language			
9 it enhances efficiency and effectiveness		9 it serves marketing and sales			
10 it reduces overhead costs		10 it illustrates how projects are best managed in organization			
11 it provides starting point for continuous development		11 it enhances quality issues			

49 individual replies – a mean of 8.2 per person – were provided by A's respondents, and categorized in order to identify the features unique to A. A categorized summary of the reasons why A currently uses an organizational project management methodology is shown in Table 15.

Table 15: Categorized qualitative summary of reasons why **A** currently uses an organizational project management methodology in a decreasing order of n_A , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 14 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **A**'s respondent only.

reasons why A currently uses an organizational project management methodology	n_A
it provides/enables common way of working	8
it recycles best practices & lessons learned, avoids re-inventing the wheel	5
it enhances quality/quality management	5
it enables and enhances project management and reaching agreed targets	3
it provides sales & marketing assistance, shows reputation	3
it enables keeping & focusing on customer promises	3
it enables & enhances business forecasting & managing business risk	3
it enhances project efficiency & effectiveness	2
it enables exchange/sharing of project personnel	2
it provides support to project manager	2
it enables decentralized way of working	2
it enables on-boarding of new staff	1
it provides structure, prevents chaos	1
it provides/establishes common language/vocabulary	1
it provides project management framework	1
it enables/enhances development of project management & project management skills	1
it defines project roles	1
it enhances chances of project success	1
it enhances co-operation between different cultures & projects	1
it reduces overhead costs/increases revenue	1
it enables & enhances experience & knowledge sharing	1
it provides a way of working required for certification & auditing (CMMI)	1

The most frequently mentioned reason appears eight times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned reasons why **A** uses an organizational project management methodology – *it provides/enables common way of working*, *it recycles best practices & lessons learned, avoids re-inventing the wheel*, and *it enhances quality/quality management* – were mentioned 18 times: 36.7 % of **A**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

A's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for A on a 1-to-10 rating scale (1 referring to *totally irrelevant*, 10 to *extremely significant*). A summary of the responses is shown in Table 16.

Table 16: Summary of A's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_A , the mean of received responses. n_A denotes the number of responses received, and SD_A the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_A	M_A	SD_A
it provides a common way of working	6	9,33	0,75
it avoids "re-inventing the wheel"	6	8,67	0,75
it provides structure to projects	6	8,67	1,11
it enhances quality of project management	6	8,67	0,94
it standardizes projects and provides consistency	6	8,50	0,96
it recycles best practices and lessons learned	6	8,33	0,94
it enhances project (planning) effectiveness	6	8,33	0,47
it enables quick "on-boarding" of new project staff	6	8,17	1,57
it enhances chances of project success	6	8,17	0,90
it enhances keeping of customer promises	6	8,17	1,34
it provides common project language/vocabulary	6	8,00	1,00
it enhances project (implementation) efficiency	6	8,00	0,58
it enhances quality of project deliverable	6	8,00	1,00
it enhances risk management	6	8,00	1,63
it enhances reaching of agreed targets	6	7,83	1,77
it enhances organizational project management	6	7,67	1,11
it enhances schedule management	6	7,67	0,94
it shows reputation and assists sales & marketing	6	7,67	1,25
it prevents chaos in projects	6	7,50	1,98
it develops project staff project management skills	6	7,50	0,76
it enhances cost management	6	7,50	1,12
it allows evaluating & comparing of project issues	6	7,50	1,50
it eliminates project unpredictability & randomness	6	7,33	2,87
it enhances reporting & information sharing	6	7,33	0,75
it enables exchanging and sharing of project staff	6	7,17	2,27
it enhances communications & information exchange	6	6,83	1,07
it optimizes use & management of project resources	6	6,33	1,25

All presented reasons received a response from all A's respondents. M_A ranges from 6.33 for *it optimizes use & management of project resources* up to 9.33 for *it provides a common way of working*. SD_A ranges from 0.47 for *it enhances project (planning) effectiveness* up to 2.87 for *it eliminates project unpredictability & randomness*.

4.3 Case organization B

4.3.1 B's context and connection to projects and project management

B is a private business organization, headquartered in Finland, operating in a mechanical engineering, production, and service business area. **B** provides technical products, services, and project deliveries to a range of customers in the public and private sectors, and in a variety of business areas. **B** is one of the leading global operators in the focal business area. At the time of the interviews **B**'s project portfolio contained over 350 projects having a total combined budget of over 700 million euro.

B is a project-based organization as a major part of **B**'s business involves project deliveries to external customers. **B** has established an expanding network of suppliers, contractors, partners, clients, and customers within which **B** operates. **B** offers off-the-shelf products and services, as well as highly specialized, engineered, innovative solutions: There is a special unit which focuses on providing project deliveries to external clients. Projects, project management, and **B**'s organizational project management methodology are critical to the operation and success of **B**'s customer project delivery unit. One of the respondents reflected "*There is no way [for **B**] to take care of major deliveries without projects and project management, that is a fact*".

4.3.2 B's organizational project management methodology history

B's organizational project management methodology development was initiated in the late 1990s when **B**'s organizational unit which focuses on customer projects was established: At the launch of the new unit the unit top management understood a common, systematic, effective and efficient way of managing large complex projects in a global business environment was required. Deploying foundation, structures, and contents from the 1996 PMI PMBOK Guide, other project management standards, public-domain project management methodologies, and competence frameworks available at the time, as well as **B**'s best project management and product processes, practices, and lessons learned, the first version of **B**'s organizational project management methodology was released in 2000. **B**'s organizational project management methodology structures and contents have since been revamped and updated several times. Increasing attention has been paid to the project management methodology as it is considered a key enabler of **B**'s highly successful global business. The latest **B**'s project management

methodology version - 2.1 at the time of the interviews - was released in September 2012.

B's customer project delivery unit organizational project management methodology is based on a phase/gate type matrix framework structure originally introduced in the 1996 PMI PMBOK Guide: Project management knowledge areas are organized into a series of parallel swim lanes proceeding through project life cycle – which is shown as a series of columns – from left to right. The framework cells are populated with links to tools, templates, descriptions, instructions, and systems appropriate to each framework cell. Project life cycle phases and project management knowledge areas have been adopted and adapted according to **B's** organizational context and specific project needs from the PMBOK Guide so that they accurately fit **B's** organizational and project needs.

B's organizational project management methodology covers projects, programs, and product processes as **B's** project deliveries are, apart from the unique details of each project, highly homogeneous. Portfolio management was being introduced into **B's** organizational project management methodology at the time of the interviews. **B's** project management framework diagram illustrates who needs to perform what, with which tool, when, how, and why, as well as the big picture of organizational project management, and the roles and responsibilities of various related parties. Having been proven in practical use, **B's** organizational project management methodology has been adopted and adapted into use in other **B's** units.

4.3.3 Using and maintaining B's organizational project management methodology

B's organizational project management methodology is expected to be followed, and adaptively applied according to the needs of each project. **B's** organizational project management methodology is intended to be supportive and encouraging, leaving sufficient room for flexibility, as opposed to being mandatory and forced onto the project management staff. The methodology aims to keep project managers working with established practices, within legal limits, and driving towards agreed project goals by offering a collection of recognized tools to work with. If a member of the project management staff has some other tools, or is able to apply the organizational tools in a better way toward reaching the agreed project targets, it is unlikely, assuming the customer is happy with this, for anyone to intervene.

While there are certain mandatory deliverables each project manager is expected to submit, each project manager is expected to adaptively apply the methodology according to the specific needs of each project and accord-

ing to common sense. **B** operates several auditing systems and dashboards which follow projects' progress and how and to what extent the organizational project management methodology is followed by **B**'s project management staff. A part of **B**'s project management staff feels the organizational project management methodology is unnecessarily bureaucratic and complex, and that grounds exist for simplification of the methodology.

B's organizational project management methodology is maintained by **B**'s project support organization using two parallel processes: As **B**'s strategy is updated, organizational project management methodology is reviewed to ensure the methodology ability to provide expected results throughout the customer project delivery procedure. Parallel to this, project management stakeholders from different organizational functions analyze available practical knowledge, including feedback, best practices, lessons learned, and new ideas looking for new structures and contents likely to enhance methodology performance assuming the proposed changes are implemented into the methodology. The initiatives from both maintenance processes are implemented into the methodology when sufficient numbers of items of adequate importance have been identified. A line organization change often provides sufficient grounds for a methodology maintenance cycle.

4.3.4 Experiences from B's organizational project management methodology

B is satisfied with the organizational project management methodology and with the methodology performance. There is an understanding **B**'s organizational project management methodology contributes to **B**'s business success, however, much work remains to be done despite the ground that has already been covered. A part of **B**'s project management staff feels the organizational project management methodology is unnecessarily bureaucratic and complex, and that grounds exist for simplification of the methodology.

B's organizational project management methodology has demonstrated it is a critical enabler of **B**'s business and a central part of the organizational operative culture. One of the respondents reflected "*In order to achieve high operational quality, skilled staff is also required [in addition to an appropriate organizational project management methodology]*".

4.3.5 Structures and contents currently used in B's organizational project management methodology

B's respondents were asked about the structures and contents currently used in B's organizational project management methodology. The replies are shown in Table 17 in the order they were given.

Table 17: Individual qualitative replies from B's respondents to the question regarding what structures and contents are currently used in B's organizational project management methodology. Bold typeface and colors matching the ones in Table 18 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one B's respondent only.

B1 methodology developer	B2 methodology user	B3 methodology user	B4 methodology user	B5 methodology manager	B6 methodology manager
1 document templates	1 project manage- ment	1 project manage- ment	1 project manage- ment	1 project dash- board	1 project manage- ment
2 process descriptions	2 framework	2 framework	2 framework	2 project manage- ment	2 framework
3 links into most im- portant pro- ject man- agement systems	3 process descriptions	2 tool map matrix with links to tools	2 process descriptions (especially contracting)	3 document templates	2 product pro- cesses inte- grated into framework
4 project manage- ment tools	4 document template	3 document templates	3 document templates	4 project manage- ment tools	3 process descriptions
5 lists of mini- mum re- quirements	5 document manage- ment in- structions per project & product	4 calculation sheets	4 phase - gate model	5 project man- agement handbook	4 document templates
6 internal and external au- diting proce- dures	5 procurement system	5 check lists		6 process descriptions	5 program & portfolio management
	6 project sched- uling tool			7 connections to sales & manufactur- ing	6 project manage- ment tools
				8 role descrip- tions	7 project man- agement training mate- rials
				9 key tasks	
				10 best practices list	
				11 project man- agement de- velopment program	
				12 training sys- tem	

40 individual replies – a mean of 6.7 per person– were provided by B's respondents, and categorized in order to identify the features unique to B. A categorized summary of the structures and contents currently used in B's organizational project management methodology is shown in Table 18.

Table 18: Categorized qualitative summary of the structures and contents currently used in **B**'s organizational project management methodology in a decreasing order of n_B , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 17 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one **B**'s respondent only.

structures and contents currently used in B's organizational project management methodology	n_B
document templates and tools	7
process descriptions/guidelines	5
process diagram/framework	5
project management tools/links thereto	5
project management development/training/certification program & materials	3
minimum & compliance requirements	2
project (control point) checklists	1
role definitions/descriptions	1
auditing procedures & systems	1
best practices & lessons learned system/process	1
phase/gate process model/structure	1
project dashboard	1
calculation sheets	1
program & portfolio management	1
project scheduling tools & processes	1
project management handbook/manual	1
procurement systems	1
connection to sales & manufacturing	1
product processes	1

The most frequently mentioned component appears seven times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in **B**'s organizational project management methodology – *document templates and tools*, *process descriptions/guidelines*, *process diagram/framework*, and *project management tools/links thereto* – were mentioned 22 times: 55 % of **B**'s replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

B's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for **B** on a 1-to-10 rating scale. A summary of the responses is shown in Table 19.

Table 19: Summary of **B**'s respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_B , the mean of received responses. n_B denotes the number of responses received, and SD_B the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_B	M_B	SD_B
project management structure	6	8,83	0,90
quality management system	6	8,83	0,69
customer feedback/satisfaction/care system	6	8,83	0,69
schedule/time management system	6	8,67	0,75
cost/budget management system	6	8,67	0,47
risk management system	6	8,67	0,47
best practices & lessons learned recycling system	6	8,67	0,75
experience & knowledge sharing system/events	6	8,50	1,61
reporting, communications & information system	6	8,33	0,47
scalable methodology (e.g. "light" & "standard")	3	8,33	1,70
project support (e.g. "master" & "apprentice") system	6	8,33	0,94
stakeholder management system	5	8,20	0,75
project staff training & on-boarding system	6	8,00	1,00
issue/risk/decision register system	5	8,00	1,26
methodology development & maintenance system	5	8,00	0,89
modular methodology structure	3	8,00	0,82
methodology use/project auditing system	6	7,83	0,37
benefits tracking/management system	5	7,80	0,75
project (management) (complexity) evaluating system	5	7,80	0,40
phase - gate/stage - gate structure	4	7,75	0,83
tailable/applicable structures & contents	5	7,60	1,02
business processes/connection to product processes	5	7,40	1,85
portfolio management structure	5	7,20	2,04
standard (PRINCE2/PMI) methodology approach	6	7,00	1,00
product processes/connection to product processes	5	6,80	1,72
program management structure	5	6,60	1,50
choice of project life cycles (e.g. "waterfall" & "agile")	4	6,25	0,83

n_B ranges from 3 for *scalable methodology (e.g. "light" & "standard")* and *modular methodology structure* up to 6 for most other presented structures. M_B ranges from 6.25 for *choice of project life cycles (e.g. "waterfall" & "agile")* up to 8.83 for *project management structure*, *quality management system*, and *customer feedback/satisfaction/care system*. SD_B ranges from 0.37 for *methodology use/project auditing system* up to 2.04 for *portfolio management structure*.

B's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for **B** on a 1-to-10 rating scale. A summary of the responses is shown in Table 20.

Table 20: Summary of **B**'s respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_B , the mean of received responses. n_B denotes the number of responses received, and SD_B the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_B	M_B	SD_B
project management tools (or links thereto)	6	8,83	0,69
information on stakeholders and customers	5	8,80	0,75
schedule/time management materials and instructions	6	8,33	0,94
project (management) dashboards	5	8,20	1,33
document templates	6	8,17	0,90
role definitions and descriptions	6	8,17	0,69
cost/budget management materials and instructions	6	8,17	1,07
project (management) checklists	6	8,17	1,07
methodology framework ("big picture")	6	8,17	0,37
process descriptions and guidelines	6	8,00	0,58
contracting/billing/invoicing materials & instructions	6	8,00	0,58
project (management) calculation sheets	6	8,00	0,58
risk management materials and instructions	6	7,83	0,69
training materials and instructions	6	7,83	0,90
quality management materials and instructions	6	7,83	0,69
health, safety and environmental materials	6	7,83	1,57
project minimum/compliance requirements	5	7,80	0,40
financing materials and instructions	5	7,80	0,75
expected phase inputs and outputs	4	7,75	0,43
project management/methodology handbook/manual	6	7,67	0,94
project management/methodology quick guide	5	7,60	1,02
change management materials and instructions	5	7,60	1,20
resource planning materials and instructions	6	7,17	0,69
methodology tailoring/applying instructions	6	7,00	1,73
decision-making materials and instructions	5	7,00	0,89
sales and marketing materials and instructions	6	6,67	0,47
process diagrams	6	6,33	1,11

n_B ranges from 4 for *expected phase inputs and outputs* up to 6 for most other presented contents. M_B ranges from 6.33 for *process diagrams* up to 8.83 for *project management tools (or links thereto)*. SD_B ranges from 0.37 for *methodology framework ("big picture")* up to 1.73 for *methodology tailoring/applying instructions*.

4.3.6 Reasons why B currently uses an organizational project management methodology

B's respondents were asked about the reasons why B currently uses an organizational project management methodology. The replies are shown in Table 21 in the order they were given.

Table 21: Individual qualitative replies from B's respondents to the question regarding reasons why B currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 22 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one B's respondent only.

B1 methodology developer	B2 methodology user	B3 methodology user	B4 methodology user	B5 methodology manager	B6 methodology manager
1 it enables similar operation regardless of environment	1 it supports reaching project targets	1 it enables project deliver according to contract (right scope, in time)	1 it enables effective risk management	1 it standardizes project operations	1 it ensures observing cultural differences
2 it reduces personification of procedures	2 it ensures all critical items are taken care of	2 it provides structure to projects	2 it enhances contract management	2 it provides common language	2 it provides common operational principles and ways of working
3 it sets minimum expected practice level	3 it reduces unnecessary & extra activities	3 it enhances risk management	3 it highlights potential pitfalls	3 it provides common lexicon	3 it provides visibility into business and business development
4 it enables sharing best practices and lessons learned	4 it provides a common way of working	4 it enhances cost management	4 it provides standardized way of working	4 it enhances project management culture	4 it enables commensurability
5 it enables on-boarding of new staff		5 it provides a common way of working globally	5 it shows reputation, provides evidence of capability	5 it harmonizes project operations	5 it provides common set of tools
6 it enables harmonizing business & projects		6 it enhances support in complex technical situations	6 it enables project staff exchange	6 it ensures customer satisfaction	6 it provides overview of project operations
7 it enables commensurability		7 it enables tailoring of product solutions	7 it enables quick on-boarding of new staff	7 it provides baseline for professional growth	7 it emphasizes learning from best practices and lessons learned
8 it provides common language		8 it enables better management of complexity	8 it provides common way of working		8 it avoids making same mistakes again
9 it provides common rules					9 it avoids reinventing the wheel
10 it enables efficient development of operations					10 it enables exchanging staff
11 it enables comprehending current maturity level					11 it enables on-boarding of new staff
12 it eliminates project unpredictability					12 it enhances business understanding
					13 it enables portfolio management
					14 it organizes project management training

53 individual replies – a mean of 8.8 per person – were provided by **B**'s respondents, and categorized in order to identify the features unique to **B**. A categorized summary of the reasons why **B** currently uses an organizational project management methodology is shown in Table 22.

Table 22: Categorized qualitative summary of reasons why **B** currently uses an organizational project management methodology in a decreasing order of n_B , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 21 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **B**'s respondent only.

reasons why B currently uses an organizational project management methodology	n_B
it provides/enables common way of working	8
it recycles best practices & lessons learned, avoids re-inventing the wheel	3
it enables/enhances development of project management & project management skills	3
it enables on-boarding of new staff	3
it provides/establishes common language/vocabulary	3
it provides structure, prevents chaos	2
it enables/enhances project commensurability	2
it enables exchange/sharing of project personnel	2
it enhances risk management	2
it standardizes projects, provides consistency	2
it highlights potential pitfalls	2
it integrates/aligns/harmonizes project management with business processes	2
it sets minimum expected practice level	2
it enables and enhances project management and reaching agreed targets	1
it provides sales & marketing assistance, shows reputation	1
it enables keeping & focusing on customer promises	1
it enhances project efficiency & effectiveness	1
it enhances chances of project success	1
it enhances cost management, saves money	1
it enables & enhances business forecasting & managing business risk	1
it eliminates/reduces project unpredictability & randomness	1
it enhances co-operation between different cultures & projects	1
it provides common tools & methods	1
it provides support to project manager	1
it enhances project culture	1
it enables/enhances portfolio management	1
it enhances contract/procurement management	1
it enables management of complexity	1
it enables tailoring of solutions	1
it increases/allows understanding maturity level	1

The most frequently mentioned reason appears eight times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned reasons why **B** uses an organizational project management methodology were mentioned 20 times: 37.7 % of **B**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

B's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for **B** on 1-to-10 rating scale. A summary of the responses is shown in Table 23.

Table 23: Summary of **B**'s respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_B , the mean of received responses. n_B denotes the number of responses received, and SD_B the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_B	M_B	SD_B
it enhances reaching of agreed targets	6	8,83	0,90
it enhances quality of project management	6	8,50	0,50
it provides common project language/vocabulary	5	8,40	0,80
it provides structure to projects	6	8,33	0,47
it enhances risk management	6	8,33	1,25
it provides a common way of working	6	8,17	0,69
it standardizes projects and provides consistency	6	8,00	1,00
it avoids "re-inventing the wheel"	6	8,00	1,29
it enhances reporting & information sharing	6	8,00	0,82
it enhances schedule management	6	7,83	1,57
it enhances keeping of customer promises	6	7,83	1,07
it enhances cost management	6	7,83	1,57
it enhances chances of project success	6	7,67	1,49
it develops project staff project management skills	6	7,67	1,25
it recycles best practices and lessons learned	6	7,67	0,94
it enhances quality of project deliverable	6	7,67	0,75
it allows evaluating & comparing of project issues	6	7,67	1,70
it enables quick "on-boarding" of new project staff	6	7,50	1,26
it enhances communications & information exchange	6	7,50	0,76
it prevents chaos in projects	6	7,50	1,89
it enhances organizational project management	6	7,33	2,29
it eliminates project unpredictability & randomness	6	7,17	1,07
it shows reputation and assists sales & marketing	6	7,17	1,34
it enhances project (planning) effectiveness	6	7,00	1,00
it enhances project (implementation) efficiency	6	6,67	0,94
it enables exchanging and sharing of project staff	6	6,67	1,70
it optimizes use & management of project resources	6	6,50	1,12

n_B ranges from 5 for *it provides common project language/vocabulary* up to 6 for all other presented reasons. M_B ranges from 6.50 for *it optimizes use & management of project resources* up to 8.83 for *it enhances reaching of agreed targets*. SD_B ranges from 0.47 for *it provides structure to projects* up to 2.29 for *it enhances organizational project management*.

4.4 Case organization C

4.4.1 C's context, connection to projects and project management

C is a private business organization, headquartered in North America, operating in the ICT business area. C is a member of a group of companies which provides financial services in an information-intensive environment. C is a leading operator in the focal area and relies extensively on its in-house ICT systems. At the time of the interviews C's project portfolio contained over 250 projects having a total combined budget of over 320 million euro.

C can be considered a project-based organization as C's information management units use projects in developing and maintaining the in-house ICT systems. C has established an expanding network of suppliers, contractors, and partners within which C operates, however, C's main business functions are run as processes, and the organization does not provide project-related deliveries, services or consulting to external customers. One of the respondents explained *"It [organizational project management methodology] is very important because unless it is an operational type activity, virtually everything that we deliver is delivered through projects. Having a methodology – a consistent, repeatable and auditable means of delivering the solutions – is of very great importance to us"*.

4.4.2 C's organizational project management methodology history

C's organizational project management methodology development was initiated in the late 1990s by C's parent organization drive to acquire companies providing similar services. Having acquired several companies, the parent company top management decided, in an attempt to expedite the integration of operations and to facilitate the in-house co-operation between projects, project sponsors, and project clients, to implement an organizational project management methodology in order to establish a common way of working, to create a common project structure, and to increase project consistency and repeatability across the family of organizations.

C's organizational project management methodology was originally created by a small team following a commercial project management methodology platform based on a PMI project management standard foundation. The methodology popularity grew among the project management staff, and the methodology was developed further to meet various organizational needs, until the number of organizational variants grew so great the meth-

odology ability to provide a consistent and repeatable common way of working started to decline. In 2007 the parent company decided to re-establish the methodology, to align the various variants into a common way of working, and to set up guidelines for methodology use including tailoring and adaptive applying.

C uses an organizational delivery methodology family which comprises the project management methodology, an application delivery methodology, and a technology integration methodology. Each methodology serves specific needs and interfaces with the other two. Although the project management methodology is always used in application delivery and technology integration projects, the methodologies are kept separate to prevent intertwining of product delivery and project delivery. The three methodologies share the same phase definitions, role definitions, deliverables and key internal controls. This modular methodology structure allows enhanced serving of specific needs, enhanced consensus forming among stakeholders, and efficient development. Each methodology is structured and populated to further enable serving focal needs.

C's organizational project management methodology is based on PMI and *Global Alliance for Project Performance Standards* (GAPPS) materials, and uses a generic four-phase project structure. C's organizational project management methodology, which does not cover program or portfolio management, differentiates between mandatory, recommended, and optional project management deliverables phase-by-phase as opposed to using a phase/gate -structure.

4.4.3 Using and maintaining C's organizational project management methodology

All C's projects involving changes to live data or production environments must follow the organizational project management methodology to ensure compliance and governance. While it is not mandatory for the other projects to follow the methodology, each supervising manager can request for the organizational project management methodology to be followed. The projects that must follow the organizational project management methodology for compliance and governance reasons are subject to audits and compliance checks.

C's organizational project management methodology calls for some mandatory project management deliverables which always have to be produced, however, flexibility is allowed regarding the breadth and depth of information in such deliverables: Use of common sense is encouraged. There are also project management deliverables which the methodology recommends,

and project management deliverables which are optional for the project to produce depending on the project backgrounds and circumstances: The more complex and critical the project, the more the recommended deliverables are deemed valuable and necessary for successful execution, and the greater the expected mandatory deliverable breadth and depth. Project managers use common sense and professional judgment to adaptively apply the methodology according to the specific needs of individual projects.

C's organizational project management methodology is maintained by a continuous process, which releases an updated version of the methodology two times a year based on the methodology sections identified as requiring updating, and the best practices and lessons learned identified as having potential to enhance methodology performance and user experience. Feedback and suggestions from practicing project managers, observations from managers supervising implementation of projects, changes in organizational governance framework, and corporate reorganizations are mainly responsible for the methodology maintenance needs. There is a team in charge of developing the methodology that decides whether a proposed change will be implemented, and approves the changes as implemented in each methodology update. The key project documents with common format, look and feel across the family of organizations require for the proposed changes to be approved and endorsed by all CIOs within the organizational family.

4.4.4 Experiences from C's organizational project management methodology

While C's organizational project management methodology provides, in general, the expected benefits, there is a feeling that there is much room for improvement. One of the respondents reflected on the need to have the organizational project management methodology adaptively applied by experienced staff: *"The methodology is about [project management] mechanics, which arguably is the easier part of the job, and only through experience can you take on greater complexity"*.

4.4.5 Structures and contents currently used in C’s organizational project management methodology

C’s respondents were asked about the structures and contents currently used in C’s organizational project management methodology. The individual replies are shown in Table 24 in the order they were given.

Table 24: Individual qualitative replies from C’s respondents to the question regarding what structures and contents are currently used in C’s organizational project management methodology. Bold typeface and colors matching the ones in Table 25 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one C’s respondent only.

C1 methodology developer	C2 methodology developer	C3 methodology user	C4 methodology user	C5 methodology manager	C6 methodology manager
1 document templates and exam- ples	1 framework	1 document templates	1 document templates	1 document templates	1 tailorable
2 role descrip- tions	2 defined	2 process	2 document examples	2 role descrip- tions	2 document templates and exam- ples
3 best project practices	3 structures	3 descriptions	3 descriptions	3 framework	2 training mate- rials
4 job aids	4 document	3 project role & responsibility descriptions	4 of purpose	4 process	3 best practices and lessons learned
5 training sys- tem & materi- als	5 overview of	4 document	4 of docu- ments	5 training mate- rials	4 descriptions
6 basic work	6 major activ- ities, deliv- erables and	5 tailoring	4 of project	6 document	5 descriptions of project de- liverables
7 corporate governance and compli- ance require- ments	7 expecta- tions	6 expected deliverable descriptions	5 types	6 repository	
	8 guidelines	7 framework			
	9 why it needs to be done				
	10 how it should be done				

39 individual replies – a mean of 6.5 per person – were provided by C’s respondents, and categorized in order to identify the features unique to C. A categorized summary of the structures and contents currently used in C’s organizational project management methodology is shown in Table 25.

Table 25: Categorized qualitative summary of the structures and contents currently used in C’s organizational project management methodology in a decreasing order of nc, the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 24 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one C’s respondent only.

structures and contents currently used in C’s organizational project management methodology	nc
document templates and tools	10
process descriptions/guidelines	9
process diagram/framework	6
minimum & compliance requirements	4
role definitions/descriptions	3
project management development/training/certification program & materials	3
best practices & lessons learned system/process	3
job aids	1

The most frequently mentioned components appear ten times and nine times, respectively, as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in C’s organizational project management methodology – *document templates and tools*, *process descriptions/guidelines*, and *process diagram/framework* – were mentioned 25 times: 64.1 % of C’s replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

C's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for C on a 1-to-10 rating scale. A summary of the responses is shown in Table 26.

Table 26: Summary of C's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_c , the mean of received responses. n_c denotes the number of responses received, and SD_c the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_c	M_c	SD_c
tailorable/applicable structures & contents	6	8,50	0,96
methodology use/project auditing system	6	8,17	1,07
scalable methodology (e.g. "light" & "standard")	6	8,00	1,91
methodology development & maintenance system	6	8,00	1,00
project staff training & on-boarding system	6	8,00	0,58
project management structure	6	7,83	1,77
reporting, communications & information system	6	7,83	1,07
cost/budget management system	6	7,67	2,29
schedule/time management system	6	7,67	2,29
risk management system	6	7,50	1,38
best practices & lessons learned recycling system	6	6,83	1,07
issue/risk/decision register system	6	6,83	1,86
choice of project life cycles (e.g. "waterfall" & "agile")	6	6,83	2,61
stakeholder management system	6	6,33	1,70
project (management) (complexity) evaluating system	4	6,25	3,11
standard (PRINCE2/PMI) methodology approach	6	6,17	1,77
experience & knowledge sharing system/events	6	6,00	1,83
quality management system	5	4,80	2,23
modular methodology structure	5	4,60	2,42
product processes/connection to product processes	6	4,33	2,56
program management structure	5	4,00	2,00
business processes/connection to business processes	5	4,00	2,19
customer feedback/satisfaction/care system	5	4,00	2,19
project support (e.g. "master" & "apprentice") system	4	4,00	2,12
phase - gate/stage - gate structure	5	3,60	2,15
portfolio management structure	5	3,60	1,74
benefits tracking/management system	4	3,00	1,87

n_c ranges from 4 for *project support (e.g. "master" & "apprentice") system*, *benefits tracking/management system*, and *project (management) (complexity) evaluating system* up to 6 for most other presented structures. M_c ranges from 3.00 for *benefits tracking/management system* up to 8.50 for *tailorable/applicable structures & contents*. SD_c ranges from 0.58 for *project staff training & on-boarding system* up to 3.11 for *project (management) (complexity) evaluating system*.

C's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for C on a 1-to-10 rating scale. A summary of the responses is shown in Table 27.

Table 27: Summary of C's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_c , the mean of received responses. n_c denotes the number of responses received, and SD_c the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_c	M_c	SD_c
methodology tailoring/applying instructions	6	8,83	0,90
document templates	6	8,50	1,26
process descriptions and guidelines	6	8,00	1,53
project minimum/compliance requirements	6	8,00	1,53
cost/budget management materials and instructions	5	7,60	2,06
risk management materials and instructions	6	7,33	1,60
schedule/time management materials and instructions	5	6,80	1,72
change management materials and instructions	6	6,67	1,97
project management tools (or links thereto)	6	6,67	2,75
role definitions and descriptions	6	6,50	2,06
methodology framework ("big picture")	6	6,50	2,81
financing materials and instructions	4	6,50	1,50
resource planning materials and instructions	5	6,20	1,47
expected phase inputs and outputs	6	6,17	2,34
training materials and instructions	6	6,17	2,79
decision-making materials and instructions	6	5,83	1,21
project (management) checklists	6	5,67	2,43
project management/methodology quick guide	6	5,50	2,63
process diagrams	6	5,33	2,62
project (management) dashboards	6	5,17	2,79
project management/methodology handbook/manual	6	5,17	2,11
quality management materials and instructions	5	5,00	1,55
contracting/billing/invoicing materials & instructions	5	4,60	2,73
information on stakeholders and customers	6	4,33	2,13
project (management) calculation sheets	5	4,20	2,56
sales and marketing materials and instructions	3	1,67	0,94
health, safety and environmental materials	3	1,67	0,94

n_c ranges from 3 for *sales and marketing materials and instructions* and *health, safety and environmental materials* up to 6 for most other presented contents. M_c ranges from 1.67 for *sales and marketing materials and instructions* and *health, safety and environmental materials* up to 8.83 for *methodology tailoring/applying instructions*. SD_c ranges from 0.90 for *methodology tailoring/applying instructions* up to 2.81 for *methodology framework ("big picture")*.

4.4.6 Reasons why C currently uses an organizational project management methodology

C's respondents were asked about the reasons why C currently uses an organizational project management methodology. The individual replies are shown in Table 28 in the order they were given.

Table 28: Individual qualitative replies from C's respondents to the question regarding reasons why C currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 29 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one C's respondent only.

C1 methodology developer	C2 methodology developer	C3 methodology user	C4 methodology user	C5 methodology manager	C6 methodology manager
1 it enhances project consistency and repeatability	1 it enables reliable & repeatable execution	1 it enables sharing of best practice and lessons learned	1 it provides consistency	1 it provides consistency	1 it enables managing risk systematically
2 it establishes common structure and way of working	2 it enhances stakeholders comprehension	2 it provides consistency	2 it allows projects proceed with less interruption to business	2 it provides structured project approach	2 it enables continuous feeding back of lessons learned
3 it enables demonstrating due diligence in execution of projects	3 it enhances project process comprehension	3 it optimizes resource sharing	3 it enables measurement of project progress	3 it enables efficient onboarding of contractors and new staff	3 it avoid having to reinvent the wheel again
4 it enables efficient onboarding and orientation of new staff	4 it enhances info transfer	4 it provides common language	4 it enhances risk management	4 it provides project management structure & approach	4 it enables faster onboarding
5 it enhances workforce portability	5 it enhances risk management			5 it forces project managers to work according to common structure	5 it allows "parachuting" way of sharing of resources
6 it provides checkpoints for evidence of compliance	6 it ensures following of regulations			6 it provides documentation and history for future references	6 it provides a common way of working
7 it helps execute projects well	7 it identifies key deliverables			7 it manages lessons learned	7 it establishes a common system of artifacts
8 it helps integrate new companies	8 it allows leverage from past experiences			8 it works as recipe book for some people	8 it increases chances of overall project success
9 it provides process improvement start	9 collecting and compiling lessons learned				9 it provides attractive feature when recruiting new staff
10 it allows duplicating successful projects	10 it allows continuous growth of practice				
	11 it establishes continuous improvement cycle				
	12 it allows management of overhead costs				
	13 it allows project teams to understand what is expected of them				
	14 it adds rigor into estimating, planning and execution				

49 replies – a mean of 8.2 per person – were provided by C's respondents, and categorized in order to identify the features unique to C. A categorized summary of the reasons why C currently uses an organizational project management methodology is shown in Table 29.

Table 29: Categorized qualitative summary of reasons why C currently uses an organizational project management methodology in a decreasing order of n_c , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 28 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one C's respondent only.

reasons why C currently uses an organizational project management methodology	n_c
it recycles best practices & lessons learned, avoids re-inventing the wheel	7
it provides/enables common way of working	4
it enables and enhances project management and reaching agreed targets	4
it enables/enhances development of project management & project management skills	4
it enhances communication, comprehension, reporting & info exchange	4
it enables exchange/sharing of project personnel	3
it enables on-boarding of new staff	3
it provides structure, prevents chaos	3
it enhances risk management	3
it standardizes projects, provides consistency	3
it provides sales & marketing assistance, shows reputation	2
it enables demonstrating & enhancing compliance & following regulations	2
it enables keeping & focusing on customer promises	1
it provides/establishes common language/vocabulary	1
it enhances chances of project success	1
it reduces overhead costs/increases revenue	1
it enables/enhances project commensurability	1
it eliminates/reduces project unpredictability & randomness	1
it allows projects proceed with less interruption to business	1

The most frequently mentioned reason appears seven times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned reasons why C uses an organizational project management methodology – *it recycles best practices & lessons learned, avoids re-inventing the wheel, it provides/enables common way of working, it enables and enhances project management and reaching agreed targets, it enables/enhances development of project management & project management skills, and it enhances communication, comprehension, reporting & info exchange* – were mentioned 23 times: 46.9 % of C's replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

C's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for C on 1-to-10 rating scale. A summary of the responses is shown in Table 30.

Table 30: Summary of C's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_c , the mean of received responses. n_c denotes the number of responses received, and SD_c the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_c	M_c	SD_c
it provides a common way of working	6	8,83	0,90
it avoids "re-inventing the wheel"	6	8,67	1,37
it provides common project language/vocabulary	6	8,67	1,37
it enables quick "on-boarding" of new project staff	6	8,50	1,50
it enhances communications & information exchange	6	8,33	1,37
it enhances organizational project management	5	8,20	1,60
it enhances reporting & information sharing	6	8,17	1,07
it standardizes projects and provides consistency	6	8,00	1,29
it provides structure to projects	6	7,33	1,25
it enhances risk management	6	7,17	1,67
it recycles best practices and lessons learned	6	6,83	1,77
it enhances chances of project success	6	6,83	0,90
it enhances reaching of agreed targets	6	6,67	2,13
it prevents chaos in projects	6	6,67	2,05
it enhances quality of project management	6	6,50	1,50
it enhances quality of project deliverable	6	6,50	1,89
it enhances cost management	6	6,33	1,49
it enables exchanging and sharing of project staff	6	6,33	1,89
it enhances schedule management	6	6,00	1,53
it develops project staff project management skills	6	6,00	1,91
it eliminates project unpredictability & randomness	6	5,67	1,89
it optimizes use & management of project resources	5	5,40	2,42
it enhances keeping of customer promises	6	5,33	1,70
it enhances project (planning) effectiveness	6	5,17	1,46
it enhances project (implementation) efficiency	6	5,17	2,03
it allows evaluating & comparing of project issues	6	4,67	2,21
it shows reputation and assists sales & marketing	3	4,33	1,89

n_c ranges from 3 for *it shows reputation and assists sales & marketing* up to 6 for most other presented reasons. M_c ranges from 4.33 for *it shows reputation and assists sales & marketing* up to 8.83 for *it provides a common way of working*. SD_c ranges from 0.90 for *it provides a common way of working* and *it enhances chances of project success* up to 2.42 for *it optimizes use & management of project resources*. A C's respondent added "it enables workforce portability across units", importance "8", to the list of reasons why organizational project management methodologies are used.

4.5 Case organization D

4.5.1 D's context and connection to projects and project management

D is a private business organization, headquartered in Africa, operating in the consulting business area. D provides project management consulting, products, and services to national and international customers in the public and private sectors in several business areas. D is one of the leading national providers in the focal business area. At the time of the interviews D's project portfolio contained over 150 projects having a total combined budget of over 650 million euro.

D is a project-based organization as all D's business involves project management products and services. D has established an expanding network of partners, clients, and customers within which D operates. D provides project management staff for managing customers' projects, project management consultants and trainers for enhancing customers' project management capability, and project management methodologies for customers to use. D focuses on projects, project management, and project management methodologies, and leaves technical project matters, including designing and engineering to customers and engineering offices. Projects, project management, and the organizational project management methodology are the core of D's operation and success. One of the respondents explained *"Because we are a consulting company, we have to deliver a high level of quality in terms of our work, because if we don't do that we won't get work. So our reputation is also linked to a consistent method and working according to very specific processes"*.

4.5.2 D's organizational project management methodology history

D's organizational project management methodology was initiated in the late 1990s when the organization was starting to grow in size. In a small company it had been easy for the project managers and consultants to agree on the common ways of working. With the company growing the top management realized it was necessary to document the D way of working in order to enhance project consistency, to have a common way of managing projects and a common set of expected project management artifacts, and to enable continuity and have the ability to exchange and replace people if necessary. The D way of managing projects was documented in a phase/gate type project management process, which was primarily based on the PMI PMBOK Guide. D's organizational project management methodology version 1.0, containing the basic project management processes,

was published in 2002. The 1.2 version, the first one to include project management training and certification, was published in 2010.

D's organizational project management methodology comprises three parts: The first part, process maps, describes the project management processes which the methodology covers, starting at portfolio selection, proceeding through project management, and continuing on to assessing project benefits. The current version of the methodology does not cover program management, however, program management will be included in the next major methodology version that is published. The second part, process descriptions, includes detailed process instructions such as the steps to take, procedures to follow, templates to use, roles to assume, and time schedules to keep as included in the first methodology version, and subsequently updated and extended according to feedback, best practices and lessons learned from completed projects. The third part includes a project management training course which each new **D** employee needs to complete subsequent to being hired to work for **D**.

D's organizational project management methodology includes an internal certification system: The first certification level focuses on the theoretical aspects of the methodology, ensuring employees understand the basic structures, processes and contents. The second certification level is experience-based and focuses on the methodology details and interpreting and adaptively applying the methodology according to specific needs of individual projects.

D has started providing the methodology, although this was not the original idea when creating the methodology, and variants of it to certain customers so some **D**'s customers are also using **D**'s organizational project management methodology. There is also a document which defines the procedures and policies for supporting the project management methodology. Early methodology versions included some product processes, however, these were removed and the methodology is now fully generic. Being fully generic and based on the best practices, the methodology is considered applicable to any project regardless of sector, business area, and size.

4.5.3 Using and maintaining **D's organizational project management methodology**

D's project managers must use the organizational project management methodology in all projects unless a customer specifically requests for another project management methodology to be used. **D**'s organizational project management methodology describes the mandatory and optional processes and documents, and the ways in which project managers are ex-

pected to apply them according to common sense, experience and expertise, and specific needs of specific projects. The methodology is very flexible and scalable: Any part of any project process or document can be removed, altered, and new material inserted as long as this is documented in writing and it serves the overall benefit of the project. A document is created in the beginning of each project in which relevant project details, the intended application of **D**'s organizational project management methodology, including backgrounds and justifications for methodology sections intentionally omitted, altered and added, and procedures agreed to be implemented by the customer, are recorded. Project managers are routinely audited for appropriately using the methodology by comparing how the project is managed against the process descriptions and the document created at the beginning of the project. One of the respondents reflected on **D**'s staff using the **D** project management methodology at a client *"I tell my guys every day we are not here in a popularity contest. Unfortunately we are the bad guys. We tell the managers the things they don't want to hear. Otherwise we are not going to make the sale, or get the benefits"*.

D's organizational project management methodology is maintained by a continuous process of collecting feedback, best practices, and lessons learned from the methodology users and stakeholders, new findings from **D**'s own research, and new ideas, structures and contents from international institutes, organizations and associations such as PMI, ISO, and AACE. **D**'s organizational project management methodology developers use several individual and interactive review techniques to decide how the methodology is updated in each release. The methodology that started as a collection of basic project management processes emphasizing the use of correct templates has turned into a robust system of project management processes emphasizing the need to have excellent information processing skills and the ability to understand the process of developing a plan as opposed to just filling in templates.

4.5.4 Experiences from **D's organizational project management methodology**

D's organizational project management methodology provides the expected results, with which both **D** and its customers are happy. The organizational project management methodology is a key enabler, and critical for **D**'s success. Some customers, especially the ones not familiar with project management, sometimes – especially when a project is not in dire straits – question some of the methodology practices. **D**'s project management staff routinely convinces the customers to trust the methodology.

4.5.5 Structures and contents currently used in D's organizational project management methodology

D's respondents were asked about the structures and contents currently used in D's organizational project management methodology. The individual replies are shown in Table 31 in the order they were given.

Table 31: Individual qualitative replies from D's respondents to the question regarding what structures and contents are currently used in D's organizational project management methodology. Bold typeface and colors matching the ones in Table 32 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one D's respondent only.

D1 methodology developer	D2 methodology user	D3 methodology user	D4 methodology manager	D5 methodology manager
1 project processes	1 stage/gate structure	1 process descriptions	1 process overview	1 project identification
2 project templates	2 process descriptions	2 document templates	2 process maps	2 project selection
3 calculation sheets	3 document templates	3 calculation sheets	3 training system	3 project initiating and planning
4 project reporting	4 reporting structure	4 audit trails	4 process descriptions	4 issue and incident management
5 communication processes & system	5 system for lessons learned	5 project schedules	5 certifying system	5 progress reporting
6 benefits tracking system	6 risk management	6 progress reporting system	6 process checklists	6 benefits measurement
7 project dashboards		7 decision registers	7 role definitions	
8 decision register		8 project charter	8 document templates	
9 incident register		9 "light" version of methodology	9 quick reference guide	
10 risk register			10 project lifecycles	

41 individual replies – a mean of 8.2 per person – were provided by D's respondents, and categorized in order to identify the features unique to D. A categorized summary of the structures and contents currently used in D's organizational project management methodology is shown in Table 32.

Table 32: Categorized qualitative summary of the structures and contents currently used in **D**'s organizational project management methodology in a decreasing order of **nd**, the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 31 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one **D**'s respondent only.

structures and contents currently used in D's organizational project management methodology	nd
issue/risk/decision registers	5
document templates and tools	4
process descriptions/guidelines	4
project reporting/reporting system	4
process diagram/framework	2
project management development/training/certification program & materials	2
calculation sheets	2
benefits tracking/management system	2
role definitions/descriptions	1
best practices & lessons learned system/process	1
project (control point) checklists	1
project dashboard	1
risk management processes & tools	1
auditing procedures & systems	1
phase/gate process model/structure	1
project scheduling tools & processes	1
program & portfolio management	1
project lifecycles	1
communication processes and systems	1
light methodology version/evaluation system	1
project charter	1
quick reference guide	1
project identification	1
project initiating & planning	1

The most frequently mentioned structures and contents in **D**'s organizational project management methodology – *issue/risk/decision registers*, *document templates and tools*, *process descriptions/guidelines*, and *project reporting/reporting system* – were mentioned 17 times: 41.5 % of **D**'s replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

D's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for D on a 1-to-10 rating scale. A summary of the responses is shown in Table 33.

Table 33: Summary of D's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_D , the mean of received responses. n_D denotes the number of responses received, and SD_D the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_D	M_D	SD_D
cost/budget management system	5	9,60	0,49
issue/risk/decision register system	5	9,60	0,49
schedule/time management system	5	9,40	0,49
risk management system	5	9,40	0,49
quality management system	5	9,40	0,80
project management structure	5	9,20	0,98
standard (PRINCE2/PMI) methodology approach	5	9,20	0,75
benefits tracking/management system	5	9,20	0,40
stakeholder management system	5	9,00	1,10
methodology use/project auditing system	5	8,80	0,75
project staff training & on-boarding system	5	8,80	1,17
phase - gate/stage - gate structure	5	8,80	0,98
scalable methodology (e.g. "light" & "standard")	5	8,60	1,36
reporting, communications & information system	5	8,60	1,50
best practices & lessons learned recycling system	5	8,60	0,80
business processes/connection to business processes	5	8,60	0,80
portfolio management structure	5	8,60	0,80
choice of project life cycles (e.g. "waterfall" & "agile")	4	8,50	0,50
tailorable/applicable structures & contents	5	8,40	0,80
methodology development & maintenance system	5	8,40	1,62
product processes/connection to product processes	5	8,40	0,49
modular methodology structure	5	8,20	1,17
project (management) (complexity) evaluating system	5	7,80	0,75
experience & knowledge sharing system/events	5	7,80	1,60
program management structure	5	7,80	2,56
customer feedback/satisfaction/care system	5	7,60	1,85
project support (e.g. "master" & "apprentice") system	5	7,60	1,02

n_D ranges from 4 for *choice of project life cycles (e.g. "waterfall" & "agile")* up to 5 for all other presented structures. M_D ranges from 7.60 for *customer feedback/satisfaction/care system* and *project support (e.g. "master" & "apprentice") system* up to 9.60 for *cost/budget management system* and *issue/risk/decision register system*. SD_D ranges from 0.40 for *benefits tracking/management system* up to 2.56 for *program management structure*.

A **D**'s respondent added "change management", "decision making structures" and "gate review" with importance "9" to the provided list of structures used in organizational project management methodologies.

D's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for **D** on a 1-to-10 rating scale. A summary of the responses is shown in Table 34.

Table 34: Summary of **D**'s respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_D , the mean of received responses. n_D denotes the number of responses received, and SD_D the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_D	M_D	SD_D
document templates	5	9,80	0,40
change management materials and instructions	5	9,60	0,49
project (management) dashboards	5	9,60	0,49
project management/methodology quick guide	5	9,20	0,75
process descriptions and guidelines	5	9,00	0,63
risk management materials and instructions	5	9,00	0,63
schedule/time management materials and instructions	5	9,00	0,89
training materials and instructions	5	9,00	0,89
process diagrams	5	9,00	0,63
role definitions and descriptions	5	8,80	0,75
project (management) checklists	5	8,80	1,17
project management/methodology handbook/manual	5	8,80	1,47
project management tools (or links thereto)	5	8,60	1,02
methodology framework ("big picture")	5	8,60	1,36
information on stakeholders and customers	5	8,60	1,02
cost/budget management materials and instructions	5	8,40	0,80
expected phase inputs and outputs	5	8,40	1,36
decision-making materials and instructions	5	8,40	1,02
quality management materials and instructions	5	8,40	0,80
contracting/billing/invoicing materials & instructions	5	8,40	1,02
project minimum/compliance requirements	5	8,20	1,94
methodology tailoring/applying instructions	5	8,00	1,67
financing materials and instructions	4	7,75	1,48
project (management) calculation sheets	5	7,60	1,85
resource planning materials and instructions	5	7,40	1,85
sales and marketing materials and instructions	4	6,50	2,60
health, safety and environmental materials	5	6,40	1,74

n_D ranges from 4 for *financial materials and instructions* and *sales and marketing materials and instructions* up to up to 5 for most other contents. M_D ranges from 6.40 for *health, safety and environmental materials* up to 9.80 for *document templates*. SD_D ranges from 0.40 for *document templates* up to 2.60 for *sales and marketing materials and instructions*.

4.5.6 Reasons why D currently uses an organizational project management methodology

D's respondents were asked about the reasons why D currently uses an organizational project management methodology. The individual replies are shown in Table 35 in the order they were given.

Table 35: Individual qualitative replies from D's respondents to the question regarding reasons why D currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 36 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one D's respondent only.

D1 methodology developer	D2 methodology user	D3 methodology user	D4 methodology manager	D5 methodology manager
1 it saves project costs	1 it provides structure to individuals practicing project management at clients	1 it provides project standardization across business areas and clients	1 it enhances consistency of project management and consulting	1 it provides structure needed for success
2 it increases project revenue	2 it provides guidance and structure to all stakeholders	2 it enables easy execution of projects in a certain way	2 it enhances continuity of project management and consulting	2 it aligns oneself with others that have methodologies
3 it improves project business	3 it helps to manage expectations	3 it enhances likelihood project will to succeed	3 it provides in-depth baseline for auditing project managers in customer projects	3 it provides recipe for success
4 it enhances project standardization	4 it ensures everyone is "on same page"	4 it highlights critical items project staff needs to focus on	4 it establishes project management routine and discipline	4 it makes targets achievable and projects repeatable
5 it enables commensurability	5 it provides role definitions for everyone involved	5 it enhances transfer of knowledge	5 it ensures high quality of rendered services	5 it provides structure for success
6 it enhances communication	6 it explains "how to get from A to B"	6 it creates structure in what would otherwise be chaos	6 it builds organizational reputation as top supplier	6 it provides gates
7 it increases discipline and planning	7 it increases potential for project being successful without trying to guarantee project will be successful		7 it helps structure projects & project managers' work	7 it recycles lessons learned and best practices
8 it aligns project with standards			8 it helps coordinate work and working methods	8 it enables transfer of knowledge
9 it eliminates project anomalies				9 it provides project management know-how for customers
10 it increases project efficiency				10 it provides order into projects
11 it enhances focus on safety, people, production & cost				11 it provides project management training
12 it prevents working with silo mindset				12 it ensures continuity
13 it improves sharing of knowledge				

46 individual replies – a mean of 9.2 per person – were provided by D's respondents, and categorized in order to identify the features unique to D. A categorized summary of the reasons why D currently uses an organizational project management methodology is shown in Table 36.

Table 36: Categorized qualitative summary of reasons why **D** currently uses an organizational project management methodology, in a decreasing order of **nd**, the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 35 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **D**'s respondent only.

reasons why D currently uses an organizational project management methodology	nd
it provides structure, prevents chaos	9
it standardizes projects, provides consistency	6
it provides/enables common way of working	5
it recycles best practices & lessons learned, avoids re-inventing the wheel	3
it enhances chances of project success	3
it enables & enhances experience & knowledge sharing	3
it enhances communication, comprehension, reporting & info exchange	2
it enables exchange/sharing of project personnel	2
it reduces overhead costs/increases revenue	2
it enables and enhances project management and reaching agreed targets	1
it enables/enhances development of project management & project management skills	1
it provides sales & marketing assistance, shows reputation	1
it enables keeping & focusing on customer promises	1
it enables/enhances project commensurability	1
it enhances quality/quality management	1
it enables & enhances business forecasting & managing business risk	1
it enhances project efficiency & effectiveness	1
it defines project roles	1
it provides a way of working required for certification & auditing (CMMI)	1
it improves & enhances focus on safety	1

The most frequently mentioned reasons appear nine and six times, respectively, as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned reasons why **D** uses an organizational project management methodology – *it provides structure, prevents chaos, it standardizes projects, provides consistency, and it provides/enables common way of working* – were mentioned 20 times: 43,5 % of **D**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

D's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for **D** on a 1-to-10 rating scale. A summary of the responses is shown in Table 37.

Table 37: Summary of **D**'s respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_D , the mean of received responses. n_D denotes the number of responses received, and SD_D the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_D	M_D	SD_D
it develops project staff project management skills	4	9,25	0,43
it standardizes projects and provides consistency	5	9,20	0,75
it provides structure to projects	5	9,00	1,10
it provides a common way of working	5	8,80	1,47
it provides common project language/vocabulary	5	8,80	1,47
it recycles best practices and lessons learned	5	8,80	0,75
it avoids "re-inventing the wheel"	5	8,60	0,80
it enhances project (planning) effectiveness	5	8,60	1,36
it enhances chances of project success	5	8,40	1,02
it enhances project (implementation) efficiency	5	8,40	1,36
it enhances risk management	5	8,20	1,47
it prevents chaos in projects	5	8,20	1,60
it enhances schedule management	5	8,20	1,60
it enhances organizational project management	5	8,00	1,67
it enables quick "on-boarding" of new project staff	5	7,80	2,56
it enhances quality of project management	5	7,80	2,04
it enhances cost management	5	7,80	1,72
it enhances communications & information exchange	5	7,60	2,58
it enhances reporting & information sharing	5	7,60	2,58
it enhances reaching of agreed targets	5	7,60	1,62
it eliminates project unpredictability & randomness	5	7,60	1,50
it shows reputation and assists sales & marketing	5	7,60	2,73
it enables exchanging and sharing of project staff	4	7,50	0,87
it enhances quality of project deliverable	5	7,40	1,96
it enhances keeping of customer promises	5	7,00	1,90
it optimizes use & management of project resources	5	6,80	2,32
it allows evaluating & comparing of project issues	5	6,80	2,32

n_D ranges from 4 for *it enables exchanging and sharing of project staff* and *it develops project staff project management skills* up to 5 for most other presented reasons. M_D ranges from 6.80 for *it allows evaluating & comparing of project issues* and *it optimizes use & management of project resources* up to 9.25 for *it develops project staff project management skills*. SD_D ranges from 0.43 for *it develops project staff project management skills* up to 2.73 for *it shows reputation and assists sales and marketing*.

A **D**'s respondent added "it enhances the change management process", with importance "8", and "it enhances incidents to track during audit process", with importance "8" to the provided list of reasons why organizations use organizational project management methodologies.

4.6 Case organization E

4.6.1 E's context and connection to projects and project management

E is a public not-for-profit organization, headquartered in Finland, operating in the ICT business area. E provides information-related services in an information-intensive environment, and relies extensively on its in-house ICT systems. E is a central operator in the focal business area, and operates one of the most extensive ICT systems in the public sector in Finland. At the time of the interviews E's IT project portfolio contained over 100 projects having a total combined budget of tens of millions of euro.

E can be considered a project-based organization as the information management unit uses projects in the developing and maintaining of the in-house ICT systems. E has established an expanding network of suppliers, contractors, and partners within which E operates, however, the main business functions are run as processes, and E does not provide project-related deliveries, services or consulting outside the organization. One of the respondents explained *"When developing ICT services, all development takes usually place in projects, however, in addition to ICT projects a substantial amount of non-ICT functional development is increasingly undertaken as projects"*.

4.6.2 E's organizational project management methodology history

E's organizational project management methodology was initiated in the mid-1980s when E's IT department started organically creating project guidelines and document templates. Avoiding typical committee work ineffectiveness was the original motive for E's project management methodology. In the 1990s these materials started to be used in other parts of the organization, and by the turn of the millennium the entire organization had acknowledged the organizational project management methodology as a key enabler of organizational development and maintenance. In 2009 there was a decision to formalize the organizational project management methodology, and to document the way it was intended to be used throughout the organization, which resulted in the first project management methodology manual release in February 2010.

E's IT department started, parallel to this, developing an IT-specific variant of the organizational project management methodology, which was released in 2011. Both E's organizational project management methodology and the IT department variant of E's organizational project management methodology have been created by in-house development work by compil-

ing best project management practices and lessons learned from internal and external sources, as opposed to being based on any single public or commercial project management methodology, or being procured off-the-shelf.

At the time of the interviews there were two project management methodology versions at **E**: A generic one intended to be used by any **E**'s project, and an IT-specific variant to be used by any **E**'s IT project. Both offer project manuals, publicly available on the intranet, which form methodology cores by providing introductions to projects, project management, and the focal methodology, as well as phase-by-phase procedures, roles, responsibilities, templates, and process diagrams. The generic methodology and the variant contain three-level strategic importance, criticality, cost, and complexity –based calculation systems for determining appropriate project management emphasis, including which parts of the methodologies should be followed, to what extent, and how.

The generic project management methodology includes organizational project, program, and portfolio management but does not go into product-related processes. The IT-specific project management methodology variant aligns with the organizational system engineering methodology, but does not go into program and portfolio management. At the time of the interviews a decision had been made to merge the IT-specific variant into the generic methodology core, however, this work remained unfinished.

4.6.3 Using and maintaining E's organizational project management methodology

E's organizational project management methodology and the IT-specific variant of the methodology are expected to be followed in general. There are some mandatory deliverables, such as the project plan, progress report, and final report, which every project must submit, however, there is no strict policy calling for mandatory following of the methodology. A new project management tool will be deployed in the near future, and this is expected to tighten the policy on following the methodology. The overall policy of **E**'s project management methodology is to provide support and guidance. Mandatory methodology sections have been deliberately minimized in order to enhance the methodology being seen in a positive perspective. There was no audit trail system at the time of the interviews, however, such a functionality was expected to be added to the methodology in the near future. **E**'s project management methodology not only allows, but requires using common sense in adaptively applying the methodology.

E's organizational project management methodology is maintained through a continuous process of collecting best practices, lessons learned, and new ideas from the methodology users, and analyzing them in order to find out whether to and how to fine tune the methodology. Advances in project management research, and new materials released by authors and international organizations are used as input for major developments to the methodology. The maintenance and development works are undertaken by a project management coordination group, which proposes changes to the methodology to a project management steering group that approves the proposed maintenance and development issues. The maintenance work results in a minor methodology update two times a year. The major development releases require a thorough review process of the proposed changes, and take place less frequently than the minor ones.

4.6.4 Experiences from E's organizational project management methodology

E's organizational project management methodology and the IT-specific variant provide the expected benefits, and are considered successful, however, it has taken a long time to get to where E is today. Further work is still required to bring all organizational units up to speed. Overcoming the silo effect and the not-invented-here –syndrome, and working despite the fragmented organizational steering structure are some of E's project management methodology main challenges.

Finding a balance between what the organizational project management methodology requires and what a specific project actually needs was identified by interviewees as a key issue on the way to success. One of the respondents concluded *"The greatest challenge we have is a strong tendency to organize ourselves in silos, and our fragmented management model ... If the silos and the barriers can be taken down, and a process-oriented way of working established, a number of the challenges can be overcome"*.

4.6.5 Structures and contents currently used in E’s organizational project management methodology

E’s respondents were asked about the structures and contents currently used in E’s organizational project management methodology. The individual replies are shown in Table 38 in the order they were given.

Table 38: Individual qualitative replies from E’s respondents to the question regarding what structures and contents are currently used in E’s organizational project management methodology. Bold typeface and colors matching the ones in Table 39 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one E’s respondent only.

E1 methodology developer	E2 methodology developer	E3 methodology user	E4 methodology manager	E5 methodology manager	E6 methodology manager
1 overall framework diagram	1 guidelines	1 process dia- grams	1 document templates and guide- lines	1 common way of working	1 project manage- ment train- ing materi- als
2 unified process de- scriptions	2 process descriptions	2 document templates	2 process descriptions and guide- lines	2 project manu- al	2 project guidelines
3 document templates	3 role descrip- tions	3 process descriptions	3 roles and responsibili- ties	3 more de- tailed pro- cess de- scriptions and training materials for IT de- partment	3 document templates and exam- ples
4 tools and methods	4 checklists	4 project manage- ment train- ing materi- als	4 project manage- ment train- ing materi- als		4 process instructions
5 terminology	5 document templates	5 intranet pages	5 connection to system engi- neering		5 project man- agement events
6 role descrip- tions	6 project manage- ment train- ing materi- als	6 questions & answers sys- tem	6 project man- agement sup- port		6 project man- agement tools
7 project phases and gates	7 co-operation between pro- ject manage- ment and ag- ile tools and techniques	7 project sup- port	7 project man- agement ex- perience shar- ing		
8 project manage- ment train- ing materi- als		8 auditing systems & tools			

39 individual replies – a mean of 6.5 per person – were provided by E’s respondents, and categorized in order to identify the features unique to E. A categorized summary of the structures and contents currently used in E’s organizational project management methodology is shown in Table 39.

Table 39: Categorized qualitative summary of the structures and contents currently used in E's organizational project management methodology in a decreasing order of n_E , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 38 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one E's respondent only.

structures and contents currently used in E's organizational project management methodology	n_E
process descriptions/guidelines	8
document templates and tools	5
project management development/training/certification program & materials	5
role definitions/descriptions	3
process diagram/framework	2
project management tools/links thereto	2
experience exchange system & events	2
project/project manager support	2
project (control point) checklists	1
auditing procedures & systems	1
phase/gate process model/structure	1
project management handbook/manual	1
common way of working	1
terminology	1
agile tools and techniques	1
intranet pages	1
Q & A section	1
connection to system engineering methodology	1

The most frequently mentioned component appears eight times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in E's organizational project management methodology – *process descriptions/guidelines*, *document templates and tools*, and *project management development/training/certification program & materials* – were mentioned 18 times: 46.2 % of E's replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

E's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for E on a 1-to-10 rating scale. A summary of the responses is shown in Table 40.

Table 40: Summary of E's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_E , the mean of received responses. n_E denotes the number of responses received, and SD_E the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_E	M_E	SD_E
project management structure	6	8,83	0,37
portfolio management structure	5	8,80	0,40
project staff training & on-boarding system	6	8,50	0,76
risk management system	6	7,83	0,90
program management structure	5	7,80	0,75
quality management system	5	7,60	1,02
phase - gate/stage - gate structure	5	7,60	1,02
issue/risk/decision register system	6	7,33	0,47
scalable methodology (e.g. "light" & "standard")	6	7,33	2,13
stakeholder management system	4	7,25	0,83
schedule/time management system	6	7,00	1,15
methodology development & maintenance system	6	7,00	1,53
modular methodology structure	6	7,00	0,58
experience & knowledge sharing system/events	6	7,00	1,00
project support (e.g. "master" & "apprentice") system	6	7,00	1,15
cost/budget management system	6	6,83	0,90
reporting, communications & information system	6	6,83	1,86
choice of project life cycles (e.g. "waterfall" & "agile")	5	6,80	1,60
best practices & lessons learned recycling system	6	6,67	1,97
customer feedback/satisfaction/care system	6	6,67	0,75
tailable/applicable structures & contents	5	6,60	0,80
business processes/connection to business processes	4	6,50	0,50
methodology use/project auditing system	5	6,40	0,80
product processes/connection to product processes	5	6,40	0,49
project (management) (complexity) evaluating system	5	6,00	3,03
benefits tracking/management system	5	5,60	1,96
standard (PRINCE2/PMI) methodology approach	5	5,20	2,14

n_E ranges from 4 for *stakeholder management system* and *business processes/connection to business processes* up to 6 for most other presented structures. M_E ranges from 5.20 for *standard (PRINCE2/PMI) methodology approach* up to 8.83 for *project management structure*. SD_E ranges from 0.37 for *project management structure* up to 3.03 for *project (management) (complexity) evaluating system*.

E's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for E on a 1-to-10 rating scale. A summary of the responses is shown in Table 41.

Table 41: Summary of E's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_E , the mean of received responses. n_E denotes the number of responses received, and SD_E the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_E	M_E	SD_E
document templates	6	9,33	0,47
process descriptions and guidelines	6	8,50	0,50
risk management materials and instructions	6	7,83	1,07
role definitions and descriptions	6	7,83	0,69
training materials and instructions	6	7,67	0,47
project (management) checklists	6	7,67	1,11
project management/methodology quick guide	5	7,40	2,06
change management materials and instructions	6	7,33	1,60
process diagrams	6	7,33	1,11
project management tools (or links thereto)	6	7,33	1,37
quality management materials and instructions	6	7,33	1,11
resource planning materials and instructions	5	7,00	1,67
methodology framework ("big picture")	6	6,83	1,07
decision-making materials and instructions	5	6,80	1,47
project minimum/compliance requirements	5	6,60	0,80
schedule/time management materials and instructions	6	6,50	1,61
project management/methodology handbook/manual	6	6,50	1,50
expected phase inputs and outputs	6	6,50	1,38
project (management) dashboards	6	6,00	2,00
methodology tailoring/applying instructions	5	6,00	1,26
project (management) calculation sheets	5	5,80	0,40
cost/budget management materials and instructions	6	5,50	1,50
information on stakeholders and customers	5	5,00	3,29
health, safety and environmental materials	5	4,80	2,14
contracting/billing/invoicing materials & instructions	4	4,00	2,12
financing materials and instructions	4	4,00	2,12
sales and marketing materials and instructions	4	4,00	3,00

n_E ranges from 4 for *contracting/billing/invoicing materials & instructions*, *financing materials and instructions*, and *sales and marketing materials and instructions* up to 6 for most other presented contents. M_E ranges from 4.00 for *contracting/billing/invoicing materials & instructions*, *financing materials and instructions*, and *sales and marketing materials and instructions* up to 9.33 for *document templates*. SD_E ranges from 0.40 for *project (management) calculation sheets* up to 3.29 for *information on stakeholders and customers*.

4.6.6 Reasons why E currently uses an organizational project management methodology

E's respondents were asked about the reasons why E currently uses an organizational project management methodology. The individual replies are shown in Table 42 in the order they were given.

Table 42: Individual qualitative replies from E's respondents to the question regarding reasons why E currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 43 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one E's respondent only.

E1 methodology developer	E2 methodology developer	E3 methodology user	E4 methodology manager	E5 methodology manager	E6 methodology manager
1 it ensures effectiveness of operations development	1 it provides professional way to manage projects	1 it introduces new project management methods	1 it enhances effectiveness of project planning & implementation	1 it enhances understanding of what is going on	1 it increases efficiency of committee work
2 it establishes a common way of working	2 it establishes unified way of working	2 it introduces new technologies	2 it optimizes project governance	2 it provides systematic way of working	2 it increases project control especially from management point of view
3 it enhances project effectiveness	3 it avoids re-inventing wheel	3 it enhances monitoring of projects	3 it enables follow-up of project and benefit creation	3 it provides orderliness in reference to use of available resources	3 it reduces randomness
4 it provides common language	4 it enhances effectiveness	4 it establishes a uniform way of working	4 it provides common way of working	4 it enhances schedule planning	4 it enhances co-operation between projects
5 it provides common tools and methods	5 it provides tools and techniques	5 it enables resource relocation between projects	5 it enables project and staff commensurability	5 it enhances effort estimation	5 it enhances resource availability and optimization
6 it provides commensurability	6 it enables resource relocation within organization	6 it makes everyone's work easier	6 it enhances project staff capabilities	6 it enhances effectiveness	6 it improves project culture
7 it defines allowed way of applying the methodology	7 it enables quick on-boarding of project staff		7 it recycles best practices and lessons learned	7 it provides common way of working	7 it enhances results orientation
	8 it provides commensurability for top management communications		8 it enables alignment with international development and research		8 it enhances dynamic approach
	9 it enhances the chances for success for major endeavors				9 it enhances management of internal work
	10 it collects, compiles and disseminates best practices and lessons learned				10 it enhances staff personal level responsibility
					11 it increases project staff motivation
					12 it provides a connection to recording work time

50 individual replies – a mean of 8.3 per person – were provided by E's respondents, and categorized in order to identify the features unique to E. A categorized summary of the reasons why E currently uses an organizational project management methodology is shown in Table 43.

Table 43: Categorized qualitative summary of reasons why **E** currently uses an organizational project management methodology in a decreasing order of n_E , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 42 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **E**'s respondent only.

reasons why E currently uses an organizational project management methodology	n_E
it provides/enables common way of working	5
it enhances project efficiency & effectiveness	5
it recycles best practices & lessons learned, avoids re-inventing the wheel	3
it enables exchange/sharing of project personnel	3
it enables and enhances project management and reaching agreed targets	3
it enables/enhances project commensurability	3
it provides common tools & methods	2
it introduces new project management methods	2
it provides structure, prevents chaos	1
it enhances chances of project success	1
it enhances communication, comprehension, reporting & info exchange	1
it enables/enhances development of project management & project management skills	1
it enables on-boarding of new staff	1
it provides/establishes common language/vocabulary	1
it eliminates/reduces project unpredictability & randomness	1
it enhances co-operation between different cultures & projects	1
it optimizes resource/personnel usage	1
it enhances project culture	1
it enhances schedule management, saves time	1
it enhances project staff capabilities	1
it enhances staff personal level responsibility	1
it increases project staff motivation	1
it enables project governance	1
it enables follow-up of project and benefit creation	1
it increases project control	1
it enhances management of internal work	1
it defines allowed way of applying/tailoring the methodology	1
it enables alignment with international development and research	1
it enhances effort estimation	1
it enhances results orientation	1
it enhances dynamic approach	1
it provides a connection to recording working time	1

The most frequently mentioned reasons why **E** uses an organizational project management methodology – *it provides/enables common way of working*, and *it enhances project efficiency & effectiveness* – were mentioned 10 times: 20 % of **E**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

E's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for E on a 1-to-10 rating scale. A summary of the responses is shown in Table 44.

Table 44: Summary of E's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_E , the mean of received responses. n_E denotes the number of responses received, and SD_E the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_E	M_E	SD_E
it enhances organizational project management	6	9,00	0,58
it provides a common way of working	6	8,83	0,90
it enhances quality of project management	6	8,83	0,37
it provides structure to projects	6	8,67	0,75
it provides common project language/vocabulary	6	8,33	1,11
it standardizes projects and provides consistency	6	8,17	0,69
it enhances project (planning) effectiveness	6	8,17	0,69
it develops project staff project management skills	6	8,00	0,82
it enhances quality of project deliverable	6	7,83	0,69
it recycles best practices and lessons learned	6	7,67	0,47
it enhances risk management	6	7,67	1,25
it enhances reaching of agreed targets	6	7,67	0,75
it enhances project (implementation) efficiency	6	7,50	1,50
it enhances schedule management	6	7,50	1,26
it eliminates project unpredictability & randomness	6	7,50	1,26
it avoids "re-inventing the wheel"	6	7,33	0,94
it enhances chances of project success	6	7,33	0,75
it enhances reporting & information sharing	6	7,33	0,75
it prevents chaos in projects	6	7,17	1,07
it enhances communications & information exchange	6	7,17	1,67
it enables exchanging and sharing of project staff	6	6,50	2,22
it enables quick "on-boarding" of new project staff	6	6,17	2,19
it enhances keeping of customer promises	6	6,00	2,08
it allows evaluating & comparing of project issues	6	5,83	0,90
it enhances cost management	6	5,50	2,29
it optimizes use & management of project resources	5	5,00	1,79
it shows reputation and assists sales & marketing	3	2,00	1,41

n_E ranges from 3 for *it shows reputation and assists sales & marketing* up to 6 for most other presented reasons. M_E ranges from 2.00 for *it shows reputation and assists sales & marketing* up to 9.00 for *it enhances organizational project management*. SD_E ranges from 0.37 for *it enhances quality of project management* up to 2.29 for *it enhances cost management*.

4.7 Case organization F

4.7.1 F's context and connection to projects and project management

F is a public not-for-profit organization, headquartered in Finland, operating in a multidisciplinary research business area. F provides research services to national and international customers in the public and private sectors. F is one of the leading national providers, and comprises a number of research units performing research under F's umbrella. F is partly funded by the federal government and the public organizations, however, the main income comes from the national and international research projects. At the time of the interviews F's project portfolio contained 2700 projects having a total combined budget of approximately 270 million euro.

F is a project-based organization as all F's research is implemented as projects. F has established an expanding network of suppliers, contractors, partners, clients, and customers within which F operates. F uses projects for contracting, designing, planning, and performing research, related systems and equipment, procuring components, products, and systems required for research, contracting services from an international network of providers, and providing the research results to clients. F considers projects, project management and the organizational project management methodology critical for organizational operation, development, and success. One of the respondents explained *"Practically all of our research work takes place in project – research work that is. Research work is recorded onto various projects. We have competence centers with agreed levels of project work allocation which each one pursues"*.

4.7.2 F's organizational project management methodology history

F's organizational project management methodology was initiated in the 1980s when F recognized the need to increase project management formality and to align research projects with applicable quality standards. When Finland joined the European Union in 1995, there was an increase in the number of international research projects, and in the need for F to improve project management professionalism. This need was satisfied by enhancing F's organizational project management methodology structures and contents. Further improvements, such as a three-level project management complexity classification system, and a project management framework diagram have been since introduced through continuous methodology development. F's organizational project management methodology has grown organically over the time without having management decisions, organiza-

tional restructurings, or off-the-shelf components to further the development.

F's organizational project management methodology contains a phase-gate project structure organically created within F. The phase-gate structure contains five consecutive phases, each one broken down to the key project management tasks at F, and decision making points, relevant to F's research projects, fitting the phases. The methodology is built around a project management framework diagram, a central hub of information which illustrates the phase-gate structure, identifies expected project status as project proceeds through the phases, and provides links to process descriptions, instructions and guidelines. The framework diagram also assigns tools and templates to be used according to the findings of the three-level project management complexity classification system, using criteria such as project budget, project risk, and F's role in the project. F's project management methodology does not directly cover program management, portfolio management, or research processes, and only focuses on project management in research projects.

4.7.3 Using and maintaining F's organizational project management methodology

F's project managers are expected to follow the organizational project management methodology in order to avoid recurring problems and hardships. Project managers are allowed, based on consideration and decision as opposed to forgetting and not understanding what was expected, to adaptively apply the methodology to suit project needs. F's projects are highly heterogeneous, and project managers are expected to apply common sense when adaptively applying the project management methodology, especially with the projects having a low level of project management complexity. Agile tools and techniques are considered applicable in most F's projects, and F is looking for a way to move towards a more flexible project management methodology. Some of F's major projects are, however, very risk intensive, and adequate formality is required to manage this risk, especially in the projects identified as having a high level of project management complexity. There are several systems for auditing project results and how the project management methodology is used, however, only once a project is finished.

F's organizational project management methodology is monitored by F's financial, quality, and R&D departments performing a continuous 360° assessment of the methodology results. There is also a continuous process for collecting and analyzing feedback and ideas from project practitioner events, as well as feedback, best practices and lessons learned from pro-

jects. When sufficient grounds exist, steps are taken to update the methodology. Only few major methodology updates have been implemented in the recent years, and the maintenance mode is one of continuous fine tuning and polishing. In order to keep F's organizational project management methodology comprehensible, there is an informal policy to remove at least one existing methodology component for each new component that is added into the methodology.

4.7.4 Experiences from F's organizational project management methodology

F is satisfied, in general, with the organizational project management methodology performance and the benefits it provides. The organizational project management methodology provides a safe way of working for most of F's projects, most of the time, and it is considered sufficient for the purpose.

Project managers are expected to apply common sense, experience and expertise to adaptively apply the organizational project management methodology according to the customer's expectations, project contexts and needs, and requirements. One of the respondents explained *"One of the important themes which is maintained in our project model is that people are aware of what is expected of them in projects. If these were not written down, I don't think we could achieve the results we are achieving currently ... It is a kind of a mindset thing which everyone needs to be aware of, but on the other hand regular check-ups such as mandatory project final evaluation - a kind of a discussion session on project results - has helped us along toward our targets. I don't have figures - 10 percent or 20 percent - but it has helped us along"*.

4.7.5 Structures and contents currently used in F's organizational project management methodology

F's respondents were asked about the structures and contents currently used in F's organizational project management methodology. The individual replies are shown in Table 45 in the order they were given.

Table 45: Individual qualitative replies from F's respondents to the question regarding what structures and contents are currently used in F's organizational project management methodology. Bold typeface and colors matching the ones in Table 46 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one F's respondent only.

F1 methodology developer	F2 methodology user	F3 methodology user	F4 methodology user	F5 methodology manager	F6 methodology manager	F7 methodology manager
1 project management framework	1 project management framework	1 project management framework	1 project management framework	1 process descriptions	1 project management framework	1 project management framework
2 links to project management tools	2 process descriptions	2 links to tools & materials	2 process guidelines	2 checklists	2 document templates	2 document templates
3 document templates	3 document templates	3 process descriptions	3 document templates	3 auditing templates	3 document management system	3 project reviewing system
4 requirements according to project management complexity level	4 process guidelines	4 roles & responsibilities	4 approval structure = gates	4 risk reviews	4 auditing system & feedback	4 health, safety & environment issues
5 communication systems	5 life cycle models	5 document templates	5 project manager support	5 guidelines	5 process descriptions	5 customer satisfaction surveys
6 financial systems	6 project guidelines according to project management complexity level	6 organizational interaction	6 project management complexity classification system		6 links to project management tools	6 guidelines and instructions
7 status reporting systems	7 annual budgeting schedule	7 connection to strategy	7 links to project management tools		7 customer care system	
		8 communication systems	8 support from financial department		8 project evaluation tool	
		9 best practices & lessons learned			9 risk profile tool	
		10 identifying commercial potential				

52 individual replies – a mean of 7.4 per person – were provided by F's respondents, and categorized in order to identify the features unique to F. A categorized summary of the structures and contents currently used in F's organizational project management methodology is shown in Table 46.

Table 46: Categorized qualitative summary of the structures and contents currently used in F's organizational project management methodology in a decreasing order of nr, the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 45 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one F's respondent only.

structures and contents currently used in F's organizational project management methodology	n_F
process descriptions/guidelines	9
document templates and tools	7
process diagram/framework	6
project management tools/links thereto	4
project/project manager support	2
auditing procedures & systems	2
risk management processes & tools	2
communication processes and systems	2
light methodology version/evaluation system	2
customer feedback/satisfaction/care system	2
finance systems	2
role definitions/descriptions	1
project (control point) checklists	1
project reporting/reporting system	1
best practices & lessons learned system/process	1
project lifecycles	1
minimum & compliance requirements	1
decision making points/structures	1
project health, safety & environment system	1
organizational interaction	1
connection to strategy	1
system for identifying commercial potential	1
project reviewing system	1

The most frequently mentioned component appears nine times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in F's organizational project management methodology – *process descriptions/guidelines*, *document templates and tools*, and *process diagram/framework* – were mentioned 22 times: 42.3 % of F's replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

F's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for F on a 1-to-10 rating scale. A summary of the responses is shown in Table 47.

Table 47: Summary of F's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_F , the mean of received responses. n_F denotes the number of responses received, and SD_F the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_F	M_F	SD_F
cost/budget management system	7	9,43	0,73
project management structure	7	9,29	0,88
reporting, communications & information system	7	8,71	1,28
business processes/connection to business processes	6	8,67	1,25
customer feedback/satisfaction/care system	7	8,57	1,29
risk management system	7	8,43	1,29
scalable methodology (e.g. "light" & "standard")	7	8,43	1,05
schedule/time management system	7	8,43	1,29
program management structure	6	8,33	0,94
tailorable/applicable structures & contents	6	8,17	1,07
quality management system	7	8,14	1,12
project (management) (complexity) evaluating system	7	8,00	0,93
project support (e.g. "master" & "apprentice") system	7	7,71	1,39
stakeholder management system	5	7,60	1,62
methodology use/project auditing system	7	7,57	1,29
portfolio management structure	6	7,50	1,26
project staff training & on-boarding system	6	7,50	1,89
best practices & lessons learned recycling system	6	7,50	0,96
experience & knowledge sharing system/events	7	7,43	1,18
benefits tracking/management system	6	7,33	1,11
phase - gate/stage - gate structure	7	7,29	1,83
issue/risk/decision register system	6	7,00	1,53
choice of project life cycles (e.g. "waterfall" & "agile")	4	6,25	2,17
methodology development & maintenance system	6	6,17	2,27
modular methodology structure	3	6,00	2,16
standard (PRINCE2/PMI) methodology approach	4	6,00	2,35
product processes/connection to product processes	4	5,75	0,83

n_F ranges from 3 for *modular methodology structure* up to 7 for most other presented structures. M_F ranges from 5.75 for *product processes/connection to product processes* up to 9.43 for *cost/budget management system*. SD_F ranges from 0.73 for *cost/budget management system* up to 2.35 for *standard (PRINCE2/PMI) methodology approach*.

F's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for F on a 1-to-10 rating scale. A summary of the responses is shown in Table 48.

Table 48: Summary of F's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_F , the mean of received responses. n_F denotes the number of responses received, and SD_F the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_F	M_F	SD_F
cost/budget management materials and instructions	7	9,14	0,99
document templates	7	9,00	1,20
contracting/billing/invoicing materials & instructions	7	9,00	1,07
process descriptions and guidelines	7	8,86	1,73
financing materials and instructions	7	8,86	0,83
project minimum/compliance requirements	6	8,83	0,69
project management tools (or links thereto)	7	8,43	0,90
schedule/time management materials and instructions	7	8,43	1,59
risk management materials and instructions	7	8,29	1,28
role definitions and descriptions	7	8,14	1,64
project management/methodology quick guide	7	8,00	2,56
process diagrams	7	8,00	1,85
quality management materials and instructions	7	8,00	1,07
methodology framework ("big picture")	7	8,00	2,39
project (management) checklists	7	7,86	1,25
information on stakeholders and customers	7	7,86	1,12
health, safety and environmental materials	7	7,86	1,25
training materials and instructions	7	7,71	2,66
project (management) calculation sheets	6	7,50	1,71
resource planning materials and instructions	7	7,29	1,28
change management materials and instructions	6	7,17	1,07
decision-making materials and instructions	6	7,17	1,21
methodology tailoring/applying instructions	7	7,14	1,36
project management/methodology handbook/manual	5	7,00	1,41
sales and marketing materials and instructions	7	7,00	1,31
expected phase inputs and outputs	5	6,60	0,49
project (management) dashboards	5	6,60	2,06

n_F ranges from 5 for *project management/methodology handbook/manual*, *expected phase inputs and outputs*, and *project (management) dashboards* up to 7 for most other presented contents. M_F ranges from 6.60 for *expected phase inputs and outputs* and *project (management) dashboards* up to 9.14 for *cost/budget management materials and instructions*. SD_F ranges from 0.49 for *expected phase inputs and outputs* up to 2.66 for *training materials and instructions*.

4.7.6 Reasons why F currently uses an organizational project management methodology

F's respondents were asked about the reasons why F currently uses an organizational project management methodology. The individual replies are shown in Table 49 in the order they were given.

Table 49: Individual qualitative replies from F's respondents to the question regarding reasons why F currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 50 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one F's respondent only.

F1 methodology developer	F2 methodology user	F3 methodology user	F4 methodology user	F5 methodology manager	F6 methodology manager	F7 methodology manager
1 it provides common way of working	1 it enhances systematic approach	1 it provides common way of working	1 it ensures high quality	1 it enables distinguishing financial flows from one another	1 it provides common way of working	1 it enables ensuring of high quality working procedures
2 it provides commensurability	2 it provides ability to monitor and control maintaining of schedule	2 it optimizes resources	2 it provides demonstration of reliability for sales and marketing	2 it provides basis for managing projects	2 it enables exchanging staff	2 it provides way to locate project documents
3 it enhances quality and quality management	3 it provides ability to monitor and control maintaining of budget	3 it ensures project management methods' distribution	3 it provides common way of working	3 it enhances reaching agreed targets	3 it enhances information sharing	3 it provides way to collect customer feedback
4 it enables financial monitoring & control of research	4 it demonstrates reliability	4 it ensures using of best knowledge	4 it enables onboarding of new staff	4 it enhances focus on project profitability	4 it ensures product quality	4 it enhances reaching of project targets
5 it focuses efforts on keeping customer promise	5 it enables internal control	5 it ensures connection to strategy	5 it enhances learning	5 it provides means to monitor spending and efficient use of funding	5 it recycles best practices and lessons learned	5 it provides common way of working
6 it enables project governance	6 it provides commensurability	6 it ensures appropriate planning	6 it increases predictability	6 it enhances risk management	6 it enhances project managers' development	6 it provides commensurability
7 it enhances communication	7 it keeps projects on track	7 it ensures high quality project management	7 it enhances cost management	7 it provides common way of working	7 it provides connection to project management systems	7 it provides audit tools
		8 it enhances approval of project proposals	8 it provides checklists		8 it provides checklists	
		9 it enhances communication & information availability	9 it enhances time management			
		10 it enhances occupational safety	10 it avoids pitfalls			
		11 it enhances procurement and contracting	11 it optimizes resource availability			
		12 it enables onboarding of new staff	12 it avoids re-inventing the wheel			
		13 it provides connection to BoD	13 it recycles lessons learned			
		14 it promotes sustainability				

63 individual replies – a mean of 9 per person – were provided by F's respondents, and categorized in order to identify the features unique to F. A

categorized summary of the reasons why **F** currently uses an organizational project management methodology is shown in Table 50.

Table 50: Categorized qualitative summary of reasons why **F** currently uses an organizational project management methodology in a decreasing order of n_F , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 49 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **F**'s respondent only.

reasons why F currently uses an organizational project management methodology	n_F
it provides/enables common way of working	6
it enables and enhances project management and reaching agreed targets	6
it recycles best practices & lessons learned, avoids re-inventing the wheel	4
it enables/enhances project commensurability	3
it enhances communication, comprehension, reporting & info exchange	3
it provides sales & marketing assistance, shows reputation	3
it enhances quality/quality management	3
it enhances cost management, saves money	3
it enables on-boarding of new staff	2
it optimizes resource/personnel usage	2
it enhances schedule management, saves time	2
it enables project governance	2
it provides checklists	2
it enables exchange/sharing of project personnel	1
it introduces new project management methods	1
it provides structure, prevents chaos	1
it enables/enhances development of project management & project management skills	1
it eliminates/reduces project unpredictability & randomness	1
it enhances project staff capabilities	1
it enhances management of internal work	1
it reduces overhead costs/increases revenue	1
it enables keeping & focusing on customer promises	1
it provides a way of working required for certification & auditing (CMMI)	1
it improves & enhances focus on safety	1
it enhances risk management	1
it highlights potential pitfalls	1
it improves organizational planning & monitoring capability	1
it provides way to locate project documents	1
it enhances contract/procurement management	1
it provides connections to project management systems	1
it enables making profit from projects	1
it ensures connection to strategy	1
it promotes sustainability	1
it enables distinguishing financial flows from one another	1
it provides way to collect customer feedback	1

The most frequently mentioned reasons why **F** uses an organizational project management methodology – *it provides/enables common way of working*, *it enables and enhances project management and reaching agreed targets*, and *it recycles best practices & lessons learned, avoids re-inventing the wheel* – were mentioned 16 times: 25.4 % of **F**'s replies men-

tioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in section 3.4.6.

F's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for F on 1-to-10 rating scale. A summary of the responses is shown in Table 51.

Table 51: Summary of F's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_F , the mean of received responses. n_F denotes the number of responses received, and SD_F the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_F	M_F	SD_F
it provides a common way of working	7	9,14	1,12
it enhances quality of project management	7	9,14	0,83
it standardizes projects and provides consistency	7	9,14	0,83
it enhances risk management	7	9,14	0,64
it enhances schedule management	7	8,86	0,83
it enhances cost management	7	8,86	0,83
it enhances organizational project management	7	8,71	1,03
it enhances project (planning) effectiveness	7	8,43	1,92
it avoids "re-inventing the wheel"	7	8,29	1,75
it provides structure to projects	7	8,14	1,46
it provides common project language/vocabulary	7	8,14	1,12
it enhances reaching of agreed targets	7	8,14	1,25
it enhances chances of project success	7	8,14	0,64
it optimizes use & management of project resources	7	8,14	0,99
it allows evaluating & comparing of project issues	7	8,00	0,93
it develops project staff project management skills	7	7,86	0,83
it enhances keeping of customer promises	7	7,86	1,64
it enhances project (implementation) efficiency	7	7,71	1,48
it eliminates project unpredictability & randomness	7	7,57	1,59
it enhances reporting & information sharing	7	7,57	0,90
it enhances quality of project deliverable	7	7,29	1,28
it enhances communications & information exchange	7	7,29	1,03
it enables quick "on-boarding" of new project staff	7	7,29	1,83
it prevents chaos in projects	7	7,14	2,23
it recycles best practices and lessons learned	7	7,00	1,31
it enables exchanging and sharing of project staff	7	6,71	1,58
it shows reputation and assists sales & marketing	7	6,43	1,50

M_F ranges from 6.43 for *it shows reputation and assists sales & marketing* up to 9.14 for several reasons. SD_F ranges from 0.64 for *it enhances risk management* and *it enhances chances of project success* up to 2.23 for *it prevents chaos in projects*.

4.8 Case organization G

4.8.1 G's context and connection to projects and project management

G is a public not-for-profit organization, headquartered in Europe, operating in the ICT business area. **G** provides information-related services in an information-intensive environment, and relies extensively on its in-house ICT systems. **G** is a central operator in the focal business area, and the second largest public organization in the geographic area in which it operates. At the time of the interviews **G**'s project portfolio contained over 70 projects having a total combined annual budget of over 20 million euro.

G can be considered a project-based organization as the internal Information Management (IM) unit uses projects in the developing and maintaining of the in-house ICT systems. **G** has established an expanding network of suppliers, contractors, and partners within which **G** operates, however, the main business functions are run as processes, and **G** does not provide project-related deliveries, services or consulting outside the organization. One of the respondents clarified *"The IM projects are central – I would say – to any changes within [G] nowadays. Since we moved from paper documentation to online system it's clear that any progress goes in that direction"*.

4.8.2 G's organizational project management methodology history

G's organizational project management methodology was initiated by a 2009 ... 2010 study of **G**'s organizational project management practices. Prior to the study PRINCE2 was being partly followed in some projects, following the introduction of PRINCE2 practices into the organization by staff recruited from other organizations, and the fact that some project managers had been PRINCE2 trained and certified while working at **G**. Study motives included a feeling the organizational project management lacked a uniform approach and required revitalization and deployment of appropriate quality management, controlling, and measuring metrics. The study results indicated a low level of project management maturity, insufficient project management foundations, and an inability for projects to provide agreed results. Having analyzed the study results, **G**'s senior management made a decision, mandating the organizational project management office to create and deploy an organizational project management methodology. First two versions of the methodology were released in 2011, and the latest version - at the time of the interviews - in June 2012.

G's organizational project management methodology consists of a PRINCE2 methodology structure trimmed down to fit **G**'s needs. An organizational project management methodology operating manual, which is available to **G**'s staff on the **G** intranet, forms the methodology core by providing an introduction to the methodology, and descriptions of the organizational project phases, policies, procedures, roles, responsibilities, templates, forms, project management checklist, and workflow diagram as well as a glossary of terms and abbreviations. The methodology covers the V-model (waterfall) and scrum (agile) project life cycles and provides instructions on how to work with each one. The methodology also contains a three-level cost, time, and risk/impact-based system for determining project size, and indicating which parts of the methodology should be followed, to what extent, and how. **G**'s organizational project management methodology focuses on project management, and does not cover program or portfolio management, nor product-related processes.

4.8.3 Using and maintaining **G's organizational project management methodology**

G's organizational project management methodology is expected to be followed. Each project manager must get an approval from the project owner in case the methodology is not followed or a deviation from the standard methodology is required. This gives flexibility, enabling project managers and owners to establish balance between what the methodology recommends and what a project requires. Project managers are expected to adaptively apply the organizational project management methodology by blending their personal experience and expertise with the recommendations of the organizational project management methodology. The methodology is intended to provide guidance for all project managers working for the organization, however, not to such extent that any project manager would be able to manage any project in the organization: **G**'s organizational project management methodology is not intended to replace project managers' experience, expertise or common sense.

There is a quality management function within **G** which works in alignment with the organizational project management methodology, reviewing project management processes and artifacts monthly to ensure the organizational project management methodology processes and instructions are followed, and templates used appropriately. Quality management assessors coach the project managers, identify weaknesses in their work, and provide guidance on improving performance.

G's organizational project management methodology is maintained by continuously collecting practical knowledge, including best practices and lessons learned from methodology users, and analyzing them in monthly project management forum meetings. In these meetings project managers evaluate development ideas and agree which ones are investigated further and which ones are finally adopted into the methodology. A new version of the methodology, with enhancements as decided by the project management forum, is released two times a year.

4.8.4 Experiences from G's organizational project management methodology

G's organizational project management methodology provides expected benefits, and is considered successful. One of the respondents reflected on G's organizational project management methodology providing expected benefits *"It depends what is expected from it really ... my expectation of it [the organizational project management methodology] is of a vehicle ... we can't send them away with this manual and say away you go and deliver your product set"*. Further work is required to enhance the already achieved results and to improve project management maturity. Continuous support from organizational top management is considered a key issue, which enables the organizational project management methodology to provide the expected results.

4.8.5 Structures and contents currently used in G's organizational project management methodology

G's respondents were asked about the structures and contents currently used in G's organizational project management methodology. The individual replies are shown Table 52 in the order they were given.

Table 52: Individual qualitative replies from G's respondents to the question regarding what structures and contents are currently used in G's organizational project management methodology. Bold typeface and colors matching the ones in Table 53 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one G's respondent only.

G1 methodology developer	G2 methodology developer	G3 methodology user	G4 methodology user	G5 methodology manager	G6 methodology manager
1 project phase/gate model	1 process descriptions	1 document templates	1 dashboard	1 document templates with in-structions	1 document templates
2 project type guide	2 document templates	2 process descriptions	2 operative tool for booking time spent on project	2 training materials	2 training materials
3 project management methodology platform	3 reporting system	3 training materials	3 document templates	3 budgeting guidelines	3 on-boarding system
4 document templates	4 auditing system	4 auditing system	4 PMO meeting system for project managers	4 process guidelines	4 process descriptions
5 process descriptions	5 training system	5 project quality management "policing"	5 database for showing project information	5 process descriptions	5 quality management system
6 project life cycles	6 lessons learned process	6 meetings for sharing experiences	6 process descriptions	6 auditing systems for assessing methodology use	6 methodology use auditing system
7 training materials	7 after-care/guarantee system	7 recycling best practices and lessons learned	7 project cost control system	7 methodology framework	7 process system
8 on-boarding session system		8 project management framework	8 project management auditing system		8 program level as aggregated from project level
9 project management support & methodology improvement system					
10 support offices					
11 dashboard					
12 project management framework					
13 checklists					

51 individual replies – a mean of 8.5 per person – were provided by G's respondents, and categorized in order to identify the features unique to G. A categorized summary of the structures and contents currently used in G's organizational project management methodology is shown in Table 53.

Table 53: Categorized qualitative summary of the structures and contents currently used in G's organizational project management methodology in a decreasing order of n_G , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 52 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one G's respondent only.

structures and contents currently used in G's organizational project management methodology	n_G
process descriptions/guidelines	8
document templates and tools	6
project management development/training/certification program & materials	6
auditing procedures & systems	5
process diagram/framework	3
best practices & lessons learned system/process	2
experience exchange system & events	2
project dashboard	2
project cost control system	2
on-boarding system	2
quality management system/tools	2
project/project manager support	1
project (control point) checklists	1
project reporting/reporting system	1
project lifecycles	1
phase/gate process model/structure	1
program & portfolio management	1
information databases	1
aftercare/guarantee system	1
operative time booking tool	1
project type guide	1
project management methodology platform	1

The most frequently mentioned component appears eight times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in G's organizational project management methodology – *process descriptions/guidelines*, *document templates and tools*, *project management development/training/certification program & materials*, and *auditing procedures & systems* – were mentioned 25 times: 49.0 % of G's replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

G's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for G on a 1-to-10 rating scale. A summary of the responses is shown in Table 54.

Table 54: Summary of G's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_G , the mean of received responses. n_G denotes the number of responses received, and SD_G the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_G	M_G	SD_G
project management structure	6	9,50	1,12
business processes/connection to business processes	6	8,83	1,21
reporting, communications & information system	6	8,33	0,94
methodology use/project auditing system	5	8,20	1,17
phase - gate/stage - gate structure	5	8,20	1,17
product processes/connection to product processes	5	8,20	1,94
standard (PRINCE2/PMI) methodology approach	6	8,17	1,57
schedule/time management system	6	7,83	1,07
project staff training & on-boarding system	6	7,83	1,34
methodology development & maintenance system	5	7,80	0,75
portfolio management structure	4	7,50	2,50
cost/budget management system	6	7,33	1,11
scalable methodology (e.g. "light" & "standard")	6	7,33	1,49
choice of project life cycles (e.g. "waterfall" & "agile")	5	7,20	1,72
quality management system	6	7,17	1,34
tailorable/applicable structures & contents	6	7,00	1,41
risk management system	6	6,83	2,11
best practices & lessons learned recycling system	6	6,83	1,07
stakeholder management system	5	6,60	1,02
modular methodology structure	4	6,50	2,29
issue/risk/decision register system	6	6,33	1,80
project support (e.g. "master" & "apprentice") system	5	6,20	1,33
experience & knowledge sharing system/events	5	6,20	1,60
benefits tracking/management system	6	6,00	2,16
program management structure	5	5,60	3,61
customer feedback/satisfaction/care system	5	5,40	1,36
project (management) (complexity) evaluating system	6	5,33	1,60

n_G ranges from 4 for *modular methodology structure* and *portfolio management structure* up to 6 for most other presented structures. M_G ranges from 5.33 for *project (management) (complexity) evaluating system* up to 9.50 for *project management structure*. SD_G ranges from 0.75 for *methodology development & maintenance system* up to 3.61 for *program management structure*.

G's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for **G** on a 1-to-10 rating scale. A summary of the responses is shown in Table 55.

Table 55: Summary of **G**'s respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_G , the mean of received responses. n_G denotes the number of responses received, and SD_G the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_G	M_G	SD_G
process descriptions and guidelines	6	8,50	0,96
role definitions and descriptions	6	8,17	1,34
project minimum/compliance requirements	5	7,60	0,80
contracting/billing/invoicing materials & instructions	4	7,50	1,80
quality management materials and instructions	6	7,50	1,80
expected phase inputs and outputs	6	7,50	1,12
methodology framework ("big picture")	6	7,33	1,60
methodology tailoring/applying instructions	6	7,33	1,11
project management/methodology quick guide	5	7,20	1,17
schedule/time management materials and instructions	6	7,17	1,57
process diagrams	6	7,17	1,57
training materials and instructions	6	7,17	1,07
cost/budget management materials and instructions	6	7,00	1,53
project (management) dashboards	6	7,00	1,15
project management/methodology handbook/manual	6	6,83	2,11
financing materials and instructions	5	6,80	1,94
document templates	6	6,67	2,21
project (management) checklists	5	6,60	1,85
project (management) calculation sheets	5	6,20	1,72
project management tools (or links thereto)	6	5,83	1,57
risk management materials and instructions	6	5,83	1,34
change management materials and instructions	6	5,50	2,29
decision-making materials and instructions	4	5,25	2,68
resource planning materials and instructions	6	5,00	2,52
information on stakeholders and customers	6	4,67	2,21
health, safety and environmental materials	4	4,50	2,06
sales and marketing materials and instructions	3	2,67	1,25

n_G ranges from 3 for *sales and marketing materials and instructions* up to 6 for most other presented contents. M_G ranges from 2.67 for *sales and marketing materials and instructions* up to 8.50 for *process descriptions and guidelines*. SD_G ranges from 0.80 for *project minimum/compliance requirements* up to 2.68 for *decision-making materials and instructions*.

4.8.6 Reasons why G currently uses an organizational project management methodology

G's respondents were asked about the reasons why G currently uses an organizational project management methodology. The individual replies are shown in Table 56 in the order they were given.

Table 56: Individual qualitative replies from G's respondents to the question regarding reasons why G currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 57 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one G's respondent only.

G1 methodology developer	G2 methodology developer	G3 methodology user	G4 methodology user	G5 methodology manager	G6 methodology manager
1 it establishes uniform way of working	1 it enhances efficiency in delivering on time and within budget	1 it enhances capability to undertake complex projects	1 it establishes common vocabulary	1 it increases project predictability of it	1 it provides clear ways to structure projects
2 it provides long-term project management development plan	2 it provides central standard for organization	2 it recycles best practices	2 it establishes a governance structure	2 it increases ability to measure projects	2 it provides consistent ways of working in projects
3 it helps projects maintain focus on deliverables	3 it enables continuous improvement of project management	3 it defines common language	3 it provides an escalation path in case of problems	3 it enhances project benefit tracking	3 it enables better control of what is included in project
4 it provides management practice and structure to projects	4 it enables measurement of improvement	4 it provides organization understanding of what is going on	4 it establishes working patterns and tips	4 it enables project prioritization	4 it offers escalation procedure
5 it ensures availability of timely and accurate information	5 it increases organizational project management maturity	5 it provides transparency and discipline to project management	5 it sets up a communication system	5 it enables portfolio management	5 it ensures projects know what to do
6 it creates project management context	6 it contributes to the evolution of project management mindset	6 it enhances top management control	6 it provides process descriptions	6 it enhances resource planning	6 it enables seeing dependencies with other projects
7 it provides long-term project management vision	7 it enables performance measurement	7 it enables more people to work as project managers	7 it provides common way of working	7 it identifies adaptive and corrective maintenance	7 it enables better management of time, scope and budget
8 it enables seeing and demonstrating project management value		8 it provides risk mitigation from management perspective	8 it provides clarity to project management		8 it sets up monthly project board meetings
9 it provides a baseline for project management improvement		9 it supports communication	9 it provides enhanced access to document templates		9 it ensures project control
		10 it makes cost & return on investments commensurable			10 it ensures appropriate decision making
		11 it pinpoints knowledge gaps			11 it ensures understanding of business case

54 individual replies – a mean of 9 per person – were provided by G's respondents, and categorized in order to identify the features unique to G. A categorized summary of the reasons why G currently uses an organizational project management methodology is shown in Table 57.

Table 57: Categorized qualitative summary of reasons why **G** currently uses an organizational project management methodology in a decreasing order of n_G , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 56 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **G**'s respondent only.

reasons why G currently uses an organizational project management methodology	n_G
it enables/enhances development of project management & project management skills	6
it enhances communication, comprehension, reporting & info exchange	5
it provides/enables common way of working	4
it enables and enhances project management and reaching agreed targets	4
it enables/enhances project commensurability	3
it provides structure, prevents chaos	3
it enables project governance	2
it provides/establishes common language/vocabulary	2
it provides escalation path in case of problems	2
it recycles best practices & lessons learned, avoids re-inventing the wheel	1
it provides sales & marketing assistance, shows reputation	1
it enables on-boarding of new staff	1
it optimizes resource/personnel usage	1
it eliminates/reduces project unpredictability & randomness	1
it enables keeping & focusing on customer promises	1
it enhances risk management	1
it highlights potential pitfalls	1
it provides way to locate project documents	1
it enhances project efficiency & effectiveness	1
it enables follow-up of project and benefit creation	1
it increases project control	1
it standardizes projects, provides consistency	1
it enables & enhances business forecasting & managing business risk	1
it enables/enhances portfolio management	1
it ensures appropriate decision making	1
it enables management of complexity	1
it enhances top management control	1
it enables project prioritization	1
it identifies adaptive maintenance from corrective maintenance	1
it enables better control of what is included in project	1
it enables checking dependencies with other projects	1
it provides process descriptions	1

The most frequently mentioned reasons why **G** currently uses an organizational project management methodology – *it enables/enhances development of project management & project management skills*, *it enhances communication, comprehension, reporting & info exchange*, *it provides/enables common way of working*, and *it enables and enhances project management and reaching agreed targets* – were mentioned 19 times: 35.2 % of **G**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

G's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for G on 1-to-10 rating scale. A summary of the responses is shown in Table 58.

Table 58: Summary of G's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_G , the mean of received responses. n_G denotes the number of responses received, and SD_G the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_G	M_G	SD_G
it provides a common way of working	6	10,00	0,00
it provides common project language/vocabulary	6	8,50	1,26
it provides structure to projects	6	8,17	1,67
it standardizes projects and provides consistency	6	8,00	0,82
it enhances organizational project management	6	7,83	0,69
it enhances project (planning) effectiveness	6	7,83	1,34
it enhances schedule management	6	7,67	1,37
it enhances quality of project management	6	7,50	0,76
it avoids "re-inventing the wheel"	6	7,50	1,26
it enhances chances of project success	6	7,50	1,38
it enhances project (implementation) efficiency	6	7,50	1,26
it enhances cost management	6	7,17	1,34
it optimizes use & management of project resources	6	7,17	1,46
it eliminates project unpredictability & randomness	6	7,17	1,67
it enhances risk management	6	7,00	1,15
it develops project staff project management skills	6	7,00	0,82
it enhances reporting & information sharing	6	7,00	1,41
it enhances communications & information exchange	6	6,83	0,90
it enhances keeping of customer promises	6	6,67	1,37
it enables quick "on-boarding" of new project staff	6	6,67	1,25
it prevents chaos in projects	6	6,67	1,97
it enhances reaching of agreed targets	6	6,50	1,26
it enhances quality of project deliverable	6	6,50	1,50
it recycles best practices and lessons learned	6	6,33	1,89
it enables exchanging and sharing of project staff	5	5,60	2,06
it allows evaluating & comparing of project issues	6	5,50	1,71
it shows reputation and assists sales & marketing	5	2,80	1,17

n_G ranges from 5 for *it enables exchanging and sharing of project staff* and *it shows reputation and assists sales & marketing* up to 6 for most other presented reasons. M_G ranges from 2.80 for *it shows reputation and assists sales & marketing* up to 10.00 for *it provides a common way of working*. SD_G ranges from 0.00 for *it provides a common way of working* up to 2.06 for *it enables exchanging and sharing of project staff*. A G's respondent added "enable maturity growth", with importance "8", and "enable portfolio management", with importance "8" to the provided list of reasons.

4.9 Case organization H

4.9.1 H's context and connection to projects and project management

H is a public not-for-profit organization, headquartered in Europe, operating in a multidisciplinary research business area. **H** provides research services to national and international customers in the public and private sectors. **H** is one of the leading national providers, and comprises a number of offices performing research under **H**'s umbrella. **H** is partly funded by the federal and local governments, however, the main income comes from the national and international research projects. At the time of the interviews **H**'s project portfolio contained over 1000 projects having a total combined budget of over 600 million euro.

H is a project-based organization as all **H**'s research is implemented as projects. **H** has established an expanding network of suppliers, contractors, partners, clients and customers within which **H** operates. **H** uses projects when contracting, designing, planning, and performing research, related systems, and equipment, procuring components, products, and systems required for research, contracting services from an international network of providers, as well as providing the research results to clients. Projects, project management, and the organizational project management methodology are critical to **H**'s operation and success. One of the respondents reflected *"The main reason for investing in pm structures, support, training etc. is definitely to support the strategy of the organization"*.

4.9.2 H's organizational project management methodology history

H's organizational project management methodology was initiated in the 1980s when **H** became involved in series of international projects of extreme size and complexity. **H**'s top management decided to implement an organizational project management methodology, based on available IPMA materials, in order to provide structure to projects, to support project managers, and to enable coordinating and managing **H**'s participation in the extreme projects. In the 2000s an updated version of the organizational project management methodology was developed and released following the PMI PMBOK Guide. The development of the next project management methodology version was started in 2008 and finished in 2010, however, this version was never published due to lack of consensus within the **H** organization. The unpublished organizational project management methodology was anticipated to be re-written and published in 2013.

H's organizational project management methodology has a generic phase-gate project management methodology platform created by the project management support staff at H's headquarters. Focusing on "what should be done" as opposed to "how it should be done", this generic organizational project management methodology has a limited ability to provide support for the specific needs of research offices or for the specific ways of managing projects. The generic organizational project management methodology is intended to be used as the baseline for creating methodology variants which fit the needs of individual research offices, and have an enhanced ability to provide support for their specific needs. Having groups of research projects with similar backgrounds and circumstances, each research office is expected to create increasingly specific project management methodology variants in order to provide the best possible support for specific project needs in specific environments. Project management methodology key properties are inherited from the generic to the semi-specific and further to the specific methodology variants. Each research office integrates the ways of working within a specific research area and with international and national clients, associations, and co-operative bodies into semi-specific methodology variants, and ways of working within a specific industry and specific stakeholders into specific methodology variants. H's project management methodology emphasizes project management, and has limited program management content. The generic organizational project management methodology does not cover product processes, however, the semi-specific and specific methodology variants are expected to cover them in increasing detail.

4.9.3 Using and maintaining H's organizational project management methodology

Project managers are expected to follow H's organizational project management methodology. The methodology provides a toolbox and serves as a guideline for project managers; project managers are expected to adaptively apply the methodology according to the needs of each individual project. At the time of the interviews H's project management methodology was flexible, giving projects a high degree of freedom to decide how and to what extent the methodology is followed. There is no system for checking whether or how the methodology is used. This flexibility will likely be reduced, and more mandatory methodology elements introduced when the next version of the generic project management methodology platform is published. H's project management methodology is not intended to be a blueprint to suc-

cess; project managers are expected to use their experience and common sense in choosing when and how to adaptively apply it.

H's generic project management methodology is maintained by a small project management support staff at H's headquarters that both provides operative project support and develops organizational project management. The generic organizational project management methodology has remained without major changes since 2000s, as the version developed from 2008 until 2010 was never published, and is waiting for re-writing and publishing. Individual research offices have been developing, maintaining and fine-tuning semi-specific and specific methodology variants according to available feedback, best practices and lessons learned. There is no central process for collecting experience other than a multi-level project manager get-together system established for direct sharing of experiences. A continuous process for collecting feedback, best practices and lessons learned is expected to be launched when the new methodology version is released.

4.9.4 Experiences from H's organizational project management methodology

H is satisfied, in general, with the organizational project management methodology and the benefits it provides. Education of project managers, approximately 150 each year, establishes a common language and a common way of working, and provides the expected benefits. With this education and experience from practical projects H's project managers proceed through career paths from junior to senior project managers.

Some key stakeholders at H remain to be convinced of the benefits available from a projectized way of working; convincing them is expected to require further attention from project support staff. One of the respondents explained *"The challenge are ... stakeholders ... to get them convinced, to accept [the organizational project management methodology], and so on. This we have in all areas, project management guidelines, quality management parts, tools, everywhere ..."*.

4.9.5 Structures and contents currently used in H's organizational project management methodology

H's respondents were asked about the structures and contents currently used in H's organizational project management methodology. The individual replies are shown in Table 59 in the order they were given.

Table 59: Individual qualitative replies from H's respondents to the question regarding what structures and contents are currently used in H's organizational project management methodology. Bold typeface and colors matching the ones in Table 60 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one H's respondent only.

H1 methodology developer	H2 methodology user	H3 methodology user	H4 methodology manager	H5 methodology manager	H6 methodology manager
1 document templates	1 document templates	1 document templates	1 document templates	1 checklists	1 framework
2 training materials	2 framework	2 process descriptions	2 training courses	2 process descriptions	2 document templates
3 framework	3 complete design descriptions & requirements	3 best practices and lessons learned	3 project manage- ment guid- ance	3 project manage- ment framework	3 training system & materials
4 project management tools	4 training materials	4 descriptions for handling main players and their needs	4 IT-based tools for project management	4 document templates	4 semi- specific process de- scriptions
5 events for sharing experiences between project managers	5 information databases	5 requirements for finalizing project phases	5 events for sharing experiences between project managers	5 process diagrams	5 background information on project sponsors
6 knowledge management system	6 experience sharing system	6 description of project folder structure		6 calendar function time plan budget tables	6 examples of documents
				9 calculation tables	
				10 work break- down structure	
				11 process rules	

40 individual replies – a mean of 6.7 per person – were provided by H's respondents, and categorized in order to identify the features unique to H. A categorized summary of the structures and contents currently used in H's organizational project management methodology is shown in Table 60.

Table 60: Categorized qualitative summary of the structures and contents currently used in **H**'s organizational project management methodology in a decreasing order of n_H , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 59 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one **H**'s respondent only.

structures and contents currently used in H's organizational project management methodology	n_H
document templates and tools	7
process descriptions/guidelines	5
process diagram/framework	5
project management development/training/certification program & materials	4
experience exchange system & events	3
project management tools/links thereto	2
stakeholder management & information system	2
best practices & lessons learned system/process	1
project (control point) checklists	1
information databases	1
minimum & compliance requirements	1
calculation sheets	1
project scheduling tools & processes	1
knowledge management system	1
product design descriptions & requirements	1
description of project folder system	1
calendar function	1
budget tables	1
work breakdown structure	1

The most frequently mentioned component appears seven times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in **H**'s organizational project management methodology – *document templates and tools*, *process descriptions/guidelines*, and *process diagram/framework* – were mentioned 17 times: 42.5 % of **H**'s replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

H's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for H on a 1-to-10 rating scale. A summary of the responses is shown in Table 61.

Table 61: Summary of H's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_H , the mean of received responses. n_H denotes the number of responses received, and SD_H the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_H	M_H	SD_H
project management structure	6	8,17	1,07
schedule/time management system	6	8,00	1,29
risk management system	6	8,00	1,00
cost/budget management system	6	7,83	1,34
best practices & lessons learned recycling system	6	7,83	1,77
phase - gate/stage - gate structure	2	7,50	1,50
quality management system	6	7,50	1,71
project support (e.g. "master" & "apprentice") system	4	7,50	0,87
project staff training & on-boarding system	6	7,33	1,37
issue/risk/decision register system	6	7,33	0,94
experience & knowledge sharing system/events	6	7,33	1,70
standard (PRINCE2/PMI) methodology approach	5	7,00	2,00
reporting, communications & information system	6	6,83	1,86
methodology development & maintenance system	4	6,75	1,30
stakeholder management system	6	6,67	0,75
tailorable/applicable structures & contents	4	6,50	3,28
choice of project life cycles (e.g. "waterfall" & "agile")	3	6,33	1,25
scalable methodology (e.g. "light" & "standard")	4	6,25	3,27
modular methodology structure	4	6,25	3,11
business processes/connection to business processes	6	6,17	1,77
customer feedback/satisfaction/care system	5	6,00	1,26
program management structure	6	5,50	2,06
benefits tracking/management system	5	5,40	1,02
methodology use/project auditing system	5	5,00	1,79
portfolio management structure	5	4,60	0,80
project (management) (complexity) evaluating system	4	4,25	3,11
product processes/connection to product processes	6	4,00	1,53

n_H ranges from 2 for *phase - gate/stage - gate structure* up to 6 for most other presented structures. M_H ranges from 4.00 for *product processes/connection to product processes* up to 8.17 for *project management structure*. SD_H ranges from 0.75 for *stakeholder management system* up to 3.28 for *tailorable/applicable structures & contents*.

A H's respondent added "[industry specific] standard approach" with importance "9" to the provided list of structures used in organizational project management methodologies.

H's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for H on a 1-to-10 rating scale. A summary of the responses is shown in Table 62.

Table 62: Summary of H's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_H , the mean of received responses. n_H denotes the number of responses received, and SD_H the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_H	M_H	SD_H
role definitions and descriptions	6	8,33	1,49
project (management) calculation sheets	6	8,00	1,15
project (management) checklists	6	7,67	1,25
process descriptions and guidelines	6	7,50	1,89
risk management materials and instructions	6	7,50	1,12
schedule/time management materials and instructions	6	7,33	1,11
expected phase inputs and outputs	6	7,33	1,25
document templates	6	7,17	2,19
project minimum/compliance requirements	6	7,17	0,90
training materials and instructions	6	7,17	1,77
methodology framework ("big picture")	6	7,00	1,63
methodology tailoring/applying instructions	4	7,00	1,22
contracting/billing/invoicing materials & instructions	6	7,00	1,15
cost/budget management materials and instructions	6	6,83	1,21
project management/methodology quick guide	5	6,80	2,04
process diagrams	6	6,67	1,49
resource planning materials and instructions	6	6,67	1,25
quality management materials and instructions	6	6,50	1,26
financing materials and instructions	6	6,50	1,26
decision-making materials and instructions	6	6,50	1,26
project management tools (or links thereto)	6	6,33	2,69
change management materials and instructions	6	6,33	1,80
project (management) dashboards	5	6,20	1,47
project management/methodology handbook/manual	5	6,00	2,53
information on stakeholders and customers	6	6,00	1,00
health, safety and environmental materials	4	5,25	1,79
sales and marketing materials and instructions	6	3,83	1,46

n_H ranges from 4 for *methodology tailoring/applying instructions* and *health, safety and environmental materials* up to 6 for most other presented contents. M_H ranges from 3.83 for *sales and marketing materials and instructions* up to 8.33 for *role definitions and descriptions*. SD_H ranges from 0.90 for *project minimum/compliance requirements* up to 2.69 for *project management tools (or links thereto)*.

4.9.6 Reasons why H currently uses an organizational project management methodology

H's respondents were asked about the reasons why H currently uses an organizational project management methodology. The individual replies are shown in Table 63 in the order they were given.

Table 63: Individual qualitative replies from H's respondents to the question regarding reasons why H currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 64 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one H's respondent only.

H1 methodology developer	H2 methodology user	H3 methodology user	H4 methodology manager	H5 methodology manager	H6 methodology manager
1 it saves money by avoiding reinventing well-known knowledge	1 it provides flexibility	1 it provides structured project management approach	1 it makes sure projects are successful	1 it enhances soft skills	1 it helps industry recognize organization as top provider of project management
2 it establishes a common way of working	2 it enhances cost management	2 it describes how to work in projects	2 it saves time	2 it establishes ethical and moral network	2 it helps organization win contracts
3 it provides access to high quality projects	3 it enhances quality management	3 it provides common language	3 it saves money	3 it harmonizes the way of working	3 it helps organization be taken seriously
4 it provides staff opportunity to take responsibility	4 it enhances project safety	4 it allows optimization of project resources, project organization and project leadership	4 it establishes a common way of working	4 it provides training for project staff	4 it allows mitigation of risk and uncertainty
5 it enables efficient onboarding of new project management staff	5 it enhances opportunity to get new contracts	5 it ensures project success	5 it optimizes use of resources	5 it enhances staff conflict management skills	5 it provides guarantee things don't go wrong
6 it enables collection and retention of key project knowledge	6 it enhances project efficiency	6 it increases project number and volume	6 it recycles knowledge, best practices and lessons learned	6 it enhances communication	6 it allows onboarding of project staff
	7 it allows exchange of project personnel between projects and organizations	7 it enables organizations influence projects		7 it enhances emotional intelligence	7 it provides staff incentive to continue working for same organization
	8 it enhances co-operation between departments	8 it allows organization take leading position in projects			

42 individual replies – a mean of 7 per person – were provided by H's respondents, and categorized in order to identify the features unique to H. A categorized summary of the reasons why H currently uses an organizational project management methodology is shown in Table 64.

Table 64: Categorized qualitative summary of reasons why **H** currently uses an organizational project management methodology in a decreasing order of n_H , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 63 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **H**'s respondent only.

reasons why H currently uses an organizational project management methodology	n_H
it provides sales & marketing assistance, shows reputation	7
it provides/enables common way of working	3
it recycles best practices & lessons learned, avoids re-inventing the wheel	3
it enables on-boarding of new staff	2
it optimizes resource/personnel usage	2
it enhances chances of project success	2
it enhances communication, comprehension, reporting & info exchange	1
it enables and enhances project management and reaching agreed targets	1
it provides structure, prevents chaos	1
it provides/establishes common language/vocabulary	1
it enhances risk management	1
it highlights potential pitfalls	1
it enhances project efficiency & effectiveness	1
it enhances quality/quality management	1
it enhances cost management, saves money	1
it enhances schedule management, saves time	1
it enables exchange/sharing of project personnel	1
it enhances project staff capabilities	1
it reduces overhead costs/increases revenue	1
it improves & enhances focus on safety	1
it enhances co-operation between different cultures & projects	1
it enhances staff personal level responsibility	1
it increases project staff motivation	1
it provides flexibility	1
it enables organizations influence projects	1
it enhances soft skills	1
it establishes ethical and moral network	1
it enhances project staff conflict management skills	1
it enhances emotional intelligence	1

The most frequently mentioned reason appears seven times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned reasons why **H** uses an organizational project management methodology – *it provides sales & marketing assistance, shows reputation, it provides/enables common way of working, and it recycles best practices & lessons learned, avoids re-inventing the wheel* – were mentioned 13 times: 31,0 % of **H**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

H's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for H on 1-to-10 rating scale. A summary of the responses is shown in Table 65.

Table 65: Summary of H's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_H , the mean of received responses. n_H denotes the number of responses received, and SD_H the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_H	M_H	SD_H
it provides structure to projects	6	8,33	1,49
it enhances quality of project management	6	8,33	0,94
it enhances chances of project success	6	8,33	0,94
it enhances risk management	6	8,33	0,94
it provides a common way of working	6	7,83	0,69
it enhances project (planning) effectiveness	6	7,83	1,46
it enhances reaching of agreed targets	6	7,83	1,07
it enhances quality of project deliverable	6	7,83	0,69
it enhances communications & information exchange	6	7,67	1,25
it standardizes projects and provides consistency	6	7,50	1,38
it enhances organizational project management	6	7,50	1,61
it enhances project (implementation) efficiency	6	7,50	1,61
it develops project staff project management skills	6	7,50	2,14
it enhances reporting & information sharing	6	7,50	1,80
it recycles best practices and lessons learned	6	7,50	0,50
it enhances schedule management	6	7,33	0,75
it enhances cost management	6	7,33	0,94
it optimizes use & management of project resources	6	7,33	1,11
it prevents chaos in projects	6	7,33	1,60
it provides common project language/vocabulary	6	7,17	1,34
it avoids "re-inventing the wheel"	6	7,17	1,07
it eliminates project unpredictability & randomness	6	6,83	1,57
it enhances keeping of customer promises	6	6,83	0,90
it shows reputation and assists sales & marketing	5	6,40	2,42
it allows evaluating & comparing of project issues	6	6,33	1,11
it enables quick "on-boarding" of new project staff	6	6,17	1,95
it enables exchanging and sharing of project staff	6	5,33	2,21

n_H ranges from 5 for *it shows reputation and assists sales & marketing* up to 6 for most other presented reasons. M_H ranges from 5,33 for *it enables exchanging and sharing of project staff* up to 8,33 for several reasons. SD_H ranges from 0,50 for *it recycles best practices and lessons learned* up to 2,42 for *it shows reputation and assists sales and marketing*. A H's respondent added "it supports strategic goals", with importance "10", and another H's respondent added "it optimizes interface to others (e.g. head-quarter)", with importance "9" to the provided list of reasons.

4.10 Case organization I

4.10.1 I's context and connection to projects and project management

I is a private business organization, headquartered in Finland, operating in a mechanical engineering, production, and service business area. I provides technical products, services and project deliveries to a range of customers in the public and private sectors. I is one of the leading global operators in the focal business area. At the time of the interviews I's project portfolio contained over 200 projects having a total combined budget of over 5400 million euro.

I is a project-based organization as a major part of I's business involves project deliveries to external customers. I has established an expanding network of suppliers, contractors, partners, clients and customers within which I operates. I offers off-the-shelf products and services, however, the main focus is on providing project deliveries to external clients. I is a versatile operator in the international project business, and employs projects in the selling, designing, developing, manufacturing, procuring, contracting, delivering as well as commissioning of the technical systems. Projects, project management and the organizational project management methodology are critical to operation and success of I. One of the respondents claimed *"100 % of [I] turnover comes from projects, ranging from simple to extremely complex according to the [organizational project management methodology] categorization criteria"*.

4.10.2 I's organizational project management methodology history

I's organizational project management methodology was initiated by a 2007 project management benchmarking process implemented in the business group within which I operates. The benchmarking process found best project management practices at I. This was followed by business group top management decisions to contract a commercial project management methodology to be used as an organizational project management methodology platform, to tailor this platform to fit the group needs, to integrate I's organizational project management practices onto this platform, and to deploy the resulting system in all organizations within the business group under the supervision of a group-wide project management office. The organizational project management methodology has never been a challenge for I as it had been the standard way of running projects before it was adapted as the business-group-wide organizational project management methodology.

I's organizational project management methodology is based on a platform provided by a commercial project management methodology, and consists of a central framework diagram which illustrates the methodology main structure and operating logic: The diagram indicates how portfolios, programs, and projects, as well as the phase-gate structures at these three levels come together as one. All the project management methodologies within the business group build on the same generic project management methodology. Each organizational unit within the business group is expected to tailor the methodology by building a modular business-specific variant of the generic organizational project management methodology according to specific organizational needs. I has established and deployed two methodology variants, each one with increasing level of detail and decreasing number of relevant projects, based on the generic organizational project management methodology. I's organizational project management methodology contains a three-level complexity- and risk-based classification system for determining which parts of the methodology are mandatory, and to what degree the project managers are allowed to adaptively apply the methodology. Focusing on organizational project, program, and portfolio management, I's organizational project management methodology does not cover product-related processes.

4.10.3 Using and maintaining I's organizational project management methodology

I's organizational project management methodology is expected to be followed, and on the other hand applied, according to the three-level complexity- and risk-based project classification system: The more complex and risky the project, the less flexibility is allowed, the more closely the organizational project management methodology must to be followed, and the more details will be required to complete the document templates. I's organizational project management methodology is not intended to replace personal consideration or common sense, and adaptively applying the methodology is expected especially when there is a customer need asking for it, for example when aligning I's phase-gate structure to the one used by a project client. There is an audit system for checking the methodology is appropriately used in project work. The projects to be audited are selected randomly, however, the higher the complexity- and risk-based project classification, the more likely it is that a project will be audited. There is a tendency for some project staff to attempt to skip some methodology tasks, typically based on common sense and previous experience, however the

audit system ensures projects remain sufficiently aligned with I's organizational project management methodology.

I's organizational project management methodology is maintained by an organizational project management office through two parallel continuous processes: Minor methodology updates are implemented following practical feedback including best practices and lessons learned from the projects using the methodology. Major revamps and upgrades to the methodology structures and contents are undertaken according to advances in project and project management research, advances in project and project management practitioner literature, as well as enhancements to the project management methodology platform by the provider of the commercial project management methodology platform.

4.10.4 Experiences from I's organizational project management methodology

I is satisfied with the organizational project management methodology and the benefits it provides. Being tightly integrated into the organizational business processes, the methodology creates a powerful tool for running project business. It keeps projects in scope, on schedule, and in budget. It maintains project quality and ensures customer satisfaction the way the organization expects. The organizational project management methodology has provided excellent results throughout the group, and is generally considered a key enabler of group project business success. One of the respondents reflected *"I would say that. By having our references we show that we can do this kind of work, and of course – it's a little like when you go to buy a car today you expect that it will behave, there will be no quality problems, and this starts also to be on the same level – that they are not asking if you are quality certified, they are not asking if you are project management certified, but sometimes they might want to have a project manager that has PMP certificate, but anyhow, it is something you should have, you should fulfill the international project management standards, that is the minimum ... And one important thing coming to my mind, even more important, is that we are talking the same language – so we can understand each other"*.

4.10.5 Structures and contents currently used in I's organizational project management methodology

I's respondents were asked about the structures and contents currently used in I's organizational project management methodology. The replies are shown in Table 66 in the order they were given.

Table 66: Individual qualitative replies from I's respondents to the question regarding what structures and contents are currently used in I's organizational project management methodology. Bold typeface and colors matching the ones in Table 67 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one I's respondent only.

I1 methodology developer	I2 methodology user	I3 methodology user	I4 methodology manager	I5 methodology manager
1 common project management framework	1 graphical methodology framework	1 business processes	1 phase/gate model for projects	1 project management framework
2 common project management phase/gate model	2 process descriptions	2 standard project management approach	3 training materials and courses	2 standardized process models
3 document templates	3 links to project management tools	3 decentralized way of working	4 document templates	3 health, safety & environmental issues
4 process descriptions	4 document templates	4 training materials	5 best practices	4 process descriptions
5 audit system	5 training materials	5 document templates	6 process instructions and descriptions	5 document templates
6 change system	6 checklists			6 training materials
7 training system & materials	7 agendas			7 auditing materials and tools
8 web page	8 project management governance model			8 links to project management tool
				9 best practices & lessons learned

36 individual replies – a mean of 7.2 per person – were provided by I's respondents, and categorized in order to identify the features unique to I. A categorized summary of the structures and contents currently used in I's organizational project management methodology is shown in Table 67.

Table 67: Categorized qualitative summary of the structures and contents currently used in I's organizational project management methodology in a decreasing order of n_i , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 66 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one I's respondent only.

structures and contents currently used in I's organizational project management methodology	n_i
document templates and tools	6
project management development/training/certification program & materials	5
process descriptions/guidelines	4
process diagram/framework	3
project management tools/links thereto	2
best practices & lessons learned system/process	2
auditing procedures & systems	2
phase/gate process model/structure	2
standard approach to project management	2
business processes	2
project (control point) checklists	1
project health, safety & environment system	1
change management tools/systems	1
project management governance model	1
methodology web page	1
decentralized way of working	1

The most frequently mentioned component appears six times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in I's organizational project management methodology – *document templates and tools*, *project management development/training/certification program & materials*, and *process descriptions/guidelines* – were mentioned 15 times: 41.7 % of I's replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

I's respondents were presented a list of the most frequently mentioned structures the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology structure was for I on a 1-to-10 rating scale. A summary of the responses is shown in Table 68.

Table 68: Summary of I's respondents' quantitative responses to the question "How important are following structures for your organizational project management methodology?" in a decreasing order of M_I , the mean of received responses. n_I denotes the number of responses received and SD_I the standard deviation of received responses. Bold typeface indicates most important structures. Gray typeface indicates least important structures.

organizational project management methodology structures	n_I	M_I	SD_I
business processes/connection to business processes	5	9,00	0,63
project management structure	5	8,80	0,40
schedule/time management system	5	8,80	0,75
portfolio management structure	4	8,75	1,09
cost/budget management system	5	8,60	0,49
phase - gate/stage - gate structure	5	8,60	0,80
customer feedback/satisfaction/care system	5	8,60	0,49
project staff training & on-boarding system	4	8,50	0,87
risk management system	5	8,40	0,80
reporting, communications & information system	5	8,40	1,74
best practices & lessons learned recycling system	5	8,20	0,75
quality management system	5	8,20	0,75
issue/risk/decision register system	5	8,00	0,63
methodology development & maintenance system	4	8,00	0,71
standard (PRINCE2/PMI) methodology approach	5	7,80	0,40
methodology use/project auditing system	5	7,80	0,40
experience & knowledge sharing system/events	5	7,60	1,85
stakeholder management system	5	7,60	1,20
project (management) (complexity) evaluating system	5	7,40	1,02
modular methodology structure	5	7,20	1,17
program management structure	5	7,20	1,47
project support (e.g. "master" & "apprentice") system	5	7,00	2,00
scalable methodology (e.g. "light" & "standard")	5	7,00	1,41
product processes/connection to product processes	3	7,00	2,16
tailable/applicable structures & contents	5	6,60	3,01
benefits tracking/management system	3	6,00	2,16
choice of project life cycles (e.g. "waterfall" & "agile")	5	4,80	1,60

n_I ranges from 3 for *product processes/connection to product processes* and *benefits tracking/management system* up to 5 for most other presented structures. M_I ranges from 4.80 for *choice of project life cycles (e.g. "waterfall" & "agile")* up to 9.00 for *business processes/connection to business processes*. SD_I ranges from 0.40 for *standard (PRINCE2/PMI) methodology approach*, *methodology use/project auditing system* and *project management structure* up to 3.01 for *tailable/applicable structures and contents*.

I's respondents were presented a list of the most frequently mentioned contents the case organizations of this research use in organizational project management methodologies, and asked how important each organizational project management methodology content was for I on a 1-to-10 rating scale. A summary of the responses is shown in Table 69.

Table 69: Summary of I's respondents' quantitative responses to the question "How important are following contents for your organizational project management methodology?" in a decreasing order of M_I , the mean of received responses. n_I denotes the number of responses received, and SD_I the standard deviation of received responses. Bold typeface indicates most important contents. Gray typeface indicates least important contents.

organizational project management methodology contents	n_I	M_I	SD_I
training materials and instructions	5	9,20	0,75
project (management) calculation sheets	2	9,00	0,00
schedule/time management materials and instructions	5	8,80	0,75
health, safety and environmental materials	5	8,80	0,40
project management/methodology handbook/manual	3	8,67	0,47
document templates	5	8,60	0,49
contracting/billing/invoicing materials & instructions	5	8,60	0,80
cost/budget management materials and instructions	5	8,60	0,49
project management tools (or links thereto)	5	8,60	1,02
project (management) checklists	4	8,50	0,50
project management/methodology quick guide	4	8,50	1,50
project (management) dashboards	4	8,50	0,50
risk management materials and instructions	5	8,40	1,20
role definitions and descriptions	5	8,20	1,47
methodology tailoring/applying instructions	5	8,20	0,75
quality management materials and instructions	5	8,20	0,75
process descriptions and guidelines	5	8,00	1,26
expected phase inputs and outputs	5	8,00	1,55
project minimum/compliance requirements	4	8,00	0,71
decision-making materials and instructions	4	7,75	1,64
sales and marketing materials and instructions	3	7,67	1,89
resource planning materials and instructions	5	7,60	1,36
change management materials and instructions	5	7,60	1,50
methodology framework ("big picture")	5	7,00	1,41
financing materials and instructions	4	7,00	1,87
information on stakeholders and customers	5	6,80	2,04
process diagrams	5	6,40	1,36

n_I ranges from 2 for *project (management) calculation sheets* up to 5 for most other presented contents. M_I ranges from 6.40 for *process diagrams* up to 9.20 for *training materials and instructions*. SD_I ranges from 0.00 for *project (management) calculation sheets* up to 2.04 for *information on stakeholders and customers*.

4.10.6 Reasons why I currently uses an organizational project management methodology

I's respondents were asked about the reasons why I currently uses an organizational project management methodology. The replies are shown in Table 70 in the order they were given.

Table 70: Individual qualitative replies from I's respondents to the question regarding reasons why I currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 71 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one I's respondent only.

I1 methodology developer	I2 methodology user	I3 methodology user	I4 methodology manager	I5 methodology manager
1 it enables bringing new staff up to speed efficiently	1 it provides structured approach to project management	1 it establishes common framework	1 it enhances project management	1 it aligns organizational way of managing projects
2 it offers baseline for projects, project management, and changes thereto	2 it recycles best practices and lessons learned	2 it establishes common way of working	2 it optimizes use of resource and collaboration	2 it establishes common language for internal and external use
3 it provides training and understanding big picture and one's role in it	3 it allows quick on-boarding of new staff	3 it enables commensurability	3 it provides common way of working	3 it enhances internal and external communication
4 it enhances decision making	4 it establishes a common language	4 it avoids pitfalls	4 it provides management focus on project portfolio	4 it demonstrates reputation, provides argument for sales and marketing
5 it enhances quality assurance	5 it aligns projects and project management with business processes	5 it enables quick on-boarding of new staff	5 it enhances project planning and monitoring capability	5 it recycles best practices
6 it provides portfolio dashboard				6 it reduces project risks
7 it coordinates projects with sales				7 it establishes project requirements
8 it coordinates projects with resource management				8 it enables production of project management methodology
9 it provides milestones for internal development				9 it establishes organizational project management culture
				10 it enhances project management competence
				11 it enables project staff understand their role in each project
				12 it integrates project management into business processes
				13 it enhances synergy between project management and business processes

37 individual replies – a mean of 7.4 per person – were provided by **I**'s respondents, and categorized in order to identify the features unique to **I**. A categorized summary of the reasons why **I** currently uses an organizational project management methodology is shown in Table 71.

Table 71: Categorized qualitative summary of reasons why **I** currently uses an organizational project management methodology in a decreasing order of n_I , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 70 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **I**'s respondent only.

reasons why I currently uses an organizational project management methodology	n_I
it integrates/aligns/harmonizes project management with business processes	4
it provides/enables common way of working	3
it enables on-boarding of new staff	3
it recycles best practices & lessons learned, avoids re-inventing the wheel	2
it optimizes resource/personnel usage	2
it enables and enhances project management and reaching agreed targets	2
it provides structure, prevents chaos	2
it provides/establishes common language/vocabulary	2
it provides project management framework	2
it provides sales & marketing assistance, shows reputation	1
it enhances communication, comprehension, reporting & info exchange	1
it enhances risk management	1
it highlights potential pitfalls	1
it enhances quality/quality management	1
it enables/enhances development of project management & project management skills	1
it enables/enhances project commensurability	1
it enables/enhances portfolio management	1
it ensures appropriate decision making	1
it improves organizational planning & monitoring capability	1
it enhances project culture	1
it defines project roles	1
it enables/provides dashboard	1
it establishes project requirements	1
it enhances project management competence	1

The most frequently mentioned reasons why **I** uses an organizational project management methodology – *it integrates/aligns/harmonizes project management with business processes*, *it provides/enables common way of working*, and *it enables on-boarding of new staff* – were mentioned 10 times: 27.0 % of **I**'s replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

I's respondents were presented a list of the most frequently mentioned reasons why the case organizations of this research use organizational project management methodologies, and asked how important each reason to use an organizational project management methodology was for I on a 1-to-10 rating scale. A summary of the responses is shown in Table 72.

Table 72: Summary of I's respondents' quantitative responses to the question "How important are following reasons to use a project management methodology for your organization?" in a decreasing order of M_I , the mean of received responses. n_I denotes the number of responses received, and SD_I the standard deviation of received responses. Bold typeface indicates most important reasons. Gray typeface indicates least important reasons.

reasons why organizations use organizational project management methodologies	n_I	M_I	SD_I
it provides a common way of working	5	8,80	0,98
it provides structure to projects	5	8,40	0,80
it enhances project (planning) effectiveness	5	8,40	1,20
it standardizes projects and provides consistency	5	8,40	1,02
it enhances project (implementation) efficiency	5	8,40	1,02
it enhances reporting & information sharing	5	8,40	1,02
it provides common project language/vocabulary	5	8,40	1,50
it enhances keeping of customer promises	5	8,40	1,20
it enables quick "on-boarding" of new project staff	5	8,40	0,49
it enhances schedule management	5	8,20	1,47
it avoids "re-inventing the wheel"	5	8,20	0,40
it enhances quality of project management	5	8,00	1,10
it enhances reaching of agreed targets	5	8,00	0,63
it enhances chances of project success	5	7,80	1,17
it enhances quality of project deliverable	5	7,80	0,98
it enhances organizational project management	5	7,80	0,98
it develops project staff project management skills	5	7,80	0,40
it recycles best practices and lessons learned	5	7,60	1,50
it enhances cost management	5	7,60	1,74
it enhances risk management	5	7,40	2,06
it prevents chaos in projects	5	7,40	0,80
it enables exchanging and sharing of project staff	5	7,20	2,23
it allows evaluating & comparing of project issues	5	7,00	1,79
it eliminates project unpredictability & randomness	5	6,80	1,17
it shows reputation and assists sales & marketing	5	6,60	1,20
it optimizes use & management of project resources	5	6,40	1,85
it enhances communications & information exchange	5	5,80	1,83

All presented reasons received a response from all I's respondents. M_I ranges from 5.80 for *it enhances communications & information exchange* up to 8.80 for *it provides a common way of working*. SD_I ranges from 0.40 for *it develops project staff project management skills* and *it avoids "re-inventing the wheel"* up to 2.23 for *it enables exchanging and sharing of project staff*.

4.11 Case organization J

4.11.1 J's context and connection to projects and project management

J is a private business organization, headquartered in Finland, operating in a mechanical engineering, production, and service business area. **J** provides technical products, services and project deliveries for customers in the public and private sectors. **J** is one of the leading global operators in the focal business area. At the time of the interviews **J**'s project portfolio contained approximately 20 projects having a total combined budget of 300 million euro.

J is a project-based organization as a major part of **J**'s business involves project deliveries to external customers. **J** has established an expanding network of suppliers, contractors, partners, clients and customers within which **J** operates. **J** offers off-the-shelf products and services, however, **J**'s main focus is on providing engineered project deliveries. **J** is a versatile operator in the international project business, and employs projects in the selling, designing, developing, planning, manufacturing, procuring, contracting, delivering, installing as well as commissioning of the technical systems. Projects, project management, and the organizational project management methodology are critical to the operation and success of **J**. **J**'s CEO considers projects and project management a critical focus area for the entire business group. One of the respondents explained *"Maintenance operations are growing continuously, and they have part deliveries, however, 90 % of our operations do take place as projects, and also maintenance work involves projects, even large projects, when it comes to maintenance contracts and major maintenance orders. Our so-called major projects, which take a minimum of 1½ years, the so-called new constructions and large retrofits comprise 80 ... 90 % of [J] turnover, so it is project business"*.

4.11.2 J's organizational project management methodology history

J's organizational project management methodology development started from scratch, building slowly through on-the-job development by practicing project managers. In 1999 **J**'s business group headquarters launched, in an attempt to establish a best-practice-based common way of working, a group-wide organizational project management methodology, which was very extensive and labor intensive. **J** quickly developed a local variant of the group-wide methodology, and developed fitting document templates. The launch was followed by group-wide audits to check the group business units

were, in fact, following the methodology. **J** had no trouble following the group-wide organizational project management methodology, as the methodology was not very different from the way **J** had been working prior to the release of the group-wide organizational project management methodology.

J's organizational project management methodology is based on a generic organizational project management methodology created by the group headquarters. The generic organizational project management methodology can be used in any project within the business group, however, it has a limited ability to provide support for a specific business unit or for a specific way of managing projects. The generic organizational project management methodology is intended to be used as the foundation for creating specific methodology variants which fit the needs of individual business units. Being able to support project management needs within the business unit, **J**'s specific project management methodology can be used in any project in the unit. Having highly homogenous projects, **J** has created specific project management structures and contents in order to provide the best possible support for specific project management needs in specific environments and circumstances. Project management methodology key properties are inherited from the generic to the semi-specific and further to the specific methodology level. The group project management methodology is based on a three-phase model, however, without gates between the start-up phase, the project execution phase, and the close-out phase. The group methodology includes a calculation system for determining project complexity, which affects project manager selection inside the group. **J**'s organizational project management methodology focuses on project management, and does not cover program or portfolio management, nor product processes. The interaction between the project management and the product processes in each project is ensured by close co-operation between the project manager and the chief designer.

4.11.3 Using and maintaining **J's organizational project management methodology**

J's organizational project management methodology is expected to be followed, and on the other hand adaptively applied, in order to find a balance between what the methodology says and what the project needs. The more complex and the more important the project, the more closely the methodology is expected to be followed; the less complex the project, the more flexibility is allowed. All deviations from the project management methodology must be justified and specifically agreed to. **J**'s organizational project man-

agement methodology is not intended to replace personal consideration or common sense. The methodology relies on the project managers' experience and expertise to understand how to adaptively apply the methodology for project benefit. Group headquarters initiates operational audits to monitor and control how the business units use and tailor the methodology. The audit system keeps projects aligned with the organizational project management methodology.

The group-level generic project management methodology is maintained by the group headquarters, however, it has remained without change for several years. A methodology use manager, who owns the project management process, decides the small-scale methodology enhancements at **J**, updating specific methodology components to increase the consistency, to integrate the feedback, best practices, and lessons learned from the field, and to fix any deficits which might be found in the methodology. Project management best practices and lessons learned, as well as methodology feedback are collected at each project close-out. There is no continuous or regular process to analyze the results and fine tune the methodology; the methodology receives fine tuning as necessary and when necessary.

4.11.4 Experiences from J's organizational project management methodology

J is satisfied with the organizational project management methodology and the benefits it provides. While there is a feeling the organizational project management methodology provides assistance as expected, project management training, experience and expertise are critical for the methodology to work as intended. If the use of **J**'s organizational project management methodology were not enforced through the chain of command, it is likely project managers would start cutting corners, especially as some project managers feel some parts of the methodology fail to provide value for them. Showing sufficient top management support for organizational project management methodology remains one of **J**'s challenges. One of the respondents elaborated "*Maybe it [**J**'s organizational project management methodology] performs because project managers are trusted. If it is a formal habit and it cannot be always followed exactly, project managers are trusted to know what they are doing. Project results are followed more closely, in a kind of reactive mode ...*".

4.11.5 Structures and contents currently used in J’s organizational project management methodology

J’s respondents were asked about the structures and contents currently used in J’s organizational project management methodology. The individual replies are shown in Table 73 in the order they were given.

Table 73: Individual qualitative replies from J’s respondents to the question regarding what structures and contents are currently used in J’s organizational project management methodology. Bold typeface and colors matching the ones in Table 74 indicate the most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one J’s respondent only.

J1 methodology user	J2 methodology user	J3 methodology manager	J4 methodology manager
1 project management framework	1 project management framework	1 project management framework	1 document templates
2 project reporting tools and systems	2 document templates	2 project management document templates	2 training materials
3 document templates	3 training materials	3 training materials	3 project phase inputs and outputs
4 project contracting and invoicing system		4 project document repository	4 project management support documents
5 project monitoring tools and system		5 project cost estimating and monitoring system	5 process descriptions
		6 project progress reporting system	6 project management framework
			7 methodology checklist sheet with components and sub-components
			8 methodology support tools and documents

22 individual replies – a mean of 5.5 per person – were provided by J’s respondents, and categorized in order to identify the features unique to J. A categorized summary of the structures and contents currently used in J’s organizational project management methodology is shown in Table 74.

Table 74: Categorized qualitative summary of the structures and contents currently used in **J**’s organizational project management methodology in a decreasing order of n_j , the number of times a specific organizational project management methodology component was mentioned. Bold typeface and colors matching the ones in Table 73 indicate most frequently mentioned structures and contents. Gray typeface indicates structures and contents mentioned by one **J**’s respondent only.

structures and contents currently used in J ’s organizational project management methodology	n_j
document templates and tools	5
process diagram/framework	4
project management development/training/certification program & materials	3
project/project manager support	2
project reporting/reporting system	2
process descriptions/guidelines	1
project (control point) checklists	1
project cost control system	1
billing/invoicing system	1
project phase inputs and outputs	1
project monitoring system	1

The most frequently mentioned component appears five times as several replies from some respondents were viewed as belonging in the same category. The most frequently mentioned structures and contents in **J**’s organizational project management methodology – *document templates and tools*, *process diagram/framework*, and *project management development/training/certification program & materials* – were mentioned 12 times: 54.5 % of **J**’s replies mentioned these organizational project management methodology structures and contents.

Based on the qualitative data, a quantitative instrument for investigating the importance of organizational project management methodology structures and contents was developed, as explained in subsection 3.4.6.

4.11.6 Reasons why J currently uses an organizational project management methodology

J's respondents were asked about the reasons why J currently uses an organizational project management methodology. The replies are shown in Table 75 in the order they were given.

Table 75: Individual qualitative replies from J's respondents to the question regarding reasons why J currently uses an organizational project management methodology. Bold typeface and colors matching the ones in Table 76 indicate the most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one J's respondent only.

J1 methodology user	J2 methodology user	J3 methodology manager	J4 methodology manager
1 it enhances project predictability	1 it provides common way of working	1 it enhances project implementation	1 it sets up common framework
2 it provides ways to plan and monitor project finances	2 it allows optimizing resource use	2 it enhances delivering customer promise	2 it provides consistent quality
3 it focuses project attention to delivering customer promise	3 it enhances project risk management	3 it enhances chances for project success	3 it helps contain risks
4 it enhances project schedule management	4 it allows demonstration of project management capability in sales and marketing	4 it helps achieve schedule targets	4 it helps achieve scope targets
5 it enhances risk management		5 it helps achieve budget targets	5 it helps achieve time targets
6 methodology use is required by headquarters		6 it enhances reporting to top management	6 it helps achieve cost targets
		7 it enhances risk management	7 it helps achieve customer satisfaction
		8 it helps in using project management systems	8 it helps provide justification for premium price
		9 it enhances resource optimization	9 it makes it easy for customer to choose and work with J
			10 it enables making profit from project deliveries
			11 it enables delivering sales staff promises
			12 it enables multi-project management
			13 it enables on-time delivery

32 individual replies – a mean of 8 per person – were provided by J's respondents, and categorized in order to identify the features unique to J. A categorized summary of the reasons why J currently uses an organizational project management methodology is shown in Table 76.

Table 76: Categorized qualitative summary of reasons why **J** currently uses an organizational project management methodology in a decreasing order of n_J , the number of times a specific reason to use an organizational project management methodology was mentioned. Bold typeface and colors matching the ones in Table 75 indicate most frequently mentioned reasons. Gray typeface indicates reasons mentioned by one **J**'s respondent only.

reasons why J currently uses an organizational project management methodology	n_J
it enhances risk management	4
it enhances schedule management, saves time	4
it enables keeping & focusing on customer promises	4
it provides sales & marketing assistance, shows reputation	3
it enhances cost management, saves money	3
it optimizes resource/personnel usage	2
it provides/enables common way of working	1
it enables and enhances project management and reaching agreed targets	1
it provides project management framework	1
it enhances communication, comprehension, reporting & info exchange	1
it enhances quality/quality management	1
it enhances chances of project success	1
it eliminates/reduces project unpredictability & randomness	1
it provides connections to project management systems	1
it enables making profit from projects	1
it enables multi-project management	1
it helps achieve scope targets	1
methodology use is mandated by HQ	1

The most frequently mentioned reasons why **J** currently uses an organizational project management methodology – *it enhances risk management*, *it enhances schedule management, saves time*, and *it enables keeping & focusing on customer promises* – were mentioned 12 times: 37.5 % of **J** replies mentioned these reasons for using an organizational project management methodology.

Based on the qualitative data, a quantitative instrument for investigating the importance of reasons why organizations use organizational project management methodologies was developed, as explained in subsection 3.4.6.

5. Cross-case analyses

This chapter presents the cross-case analyses of the organizational project management methodologies investigated in this research.

5.1 Introduction

The organizational project management methodologies investigated in this research were analyzed cross-case in order to identify the most common and the most important organizational project management methodology structures and contents, and reasons why organizations use such methodologies.

The most common organizational project management methodology structures and contents, and reasons why organizations use organizational project management methodologies were identified by analyzing qualitative data. The most important organizational project management methodology structures and contents, and reasons why organizations use organizational project management methodologies were identified by analyzing quantitative data.

This chapter contains an introduction and four main sections:

5.2 Organizational project management methodology structures

5.3 Organizational project management methodology contents

5.4 Reasons why organizations use organizational project management methodologies

5.5 Organizational project management methodologies' connections to research findings

Sections 5.2 ... 5.4 build on the within-case analyses presented in Chapter 4, providing cross-case analyses of qualitative data and of quantitative data. Section 5.5 builds on the analyses in sections 5.2 ... 5.4, and identifies the connections the individual organizational project management methodologies have with the main research findings.

5.2 Organizational project management methodology structures

5.2.1 Cross-case analysis of qualitative data

This subsection presents an analysis of qualitative data in order to identify the most common organizational project management methodology structures. The qualitative data, collected by interviewing 57 respondents, are shown in Table 77.

The data show the case organizations' unique use of structures in their organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

Table 77: Qualitative data regarding the structures organizations use in organizational project management methodologies in a decreasing order of Σ , the sum of organizational figures

organizational project management methodology structures	A	B	C	D	E	F	G	H	I	J	Σ
auditing procedures & systems	1		1	1	2	5			2		12
BP & LL system / process	1	3	1		1	2	1	2			11
project reporting / reporting system				4		1	1			2	8
experience exchange system & events					2		2	3			7
project / project manager support					2	2	1			2	7
phase / gate process model / structure	1		1	1			1		2		6
issue / risk / decision registers				5							5
customer feedback / satisfaction / care system	1						2				3
project cost control system							2			1	3
project lifecycles				1		1	1				3
program & portfolio management	1		1				1				3
communication processes and systems				1		2					3
light methodology version / evaluation system				1		2					3
billing / invoicing system	1									1	2
change management tools / systems	1								1		2
decision making points / structures	1					1					2
benefits tracking / management system				2							2
on-boarding system							2				2
quality management system / tools							2				2
information databases							1	1			2
stakeholder management & information system								2			2
standard approach to project management									2		2
business processes									2		2
project health, safety & environment system						1			1		2
finance systems						2					2

The data identify auditing procedures & systems, best practice and lessons learned system / process, project reporting / reporting system, experience exchange system and events, as well as project / project manager support as the most common organizational project management methodology structures among the case organizations.

Furthermore, the data show unique organizational features, such as **C**'s use of best practices and lessons learned system / process, **D**'s use of issue / risk / decision registers and project reporting / reporting system, **G**'s use of auditing procedures and systems, and **H**'s use of experience exchange system and events.

Finally, the data reveal the case organizations' use of organizational project management methodology structures, such as a phase / gate process model / structure, which are emphasized in public-domain and commercial project management methodologies, as well as the use of structures, such as health, safety, and environmental systems, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing project management challenges related to specific organizational and project contexts.

The following organizational project management methodology structures, identified as the most common among the case organizations, are analyzed further in the following paragraphs:

- auditing procedures and systems
- best practices and lessons learned system / process
- project reporting / reporting system
- experience exchange system and events
- project / project manager support

Auditing procedures and systems are the most common organizational project management methodology structures, appearing in the data 12 times by respondents from **B**, **D**, **E**, **F**, **G**, and **I**. Respondents from **G** consider them the most common organizational project management methodology structures. **G**'s quality management function – working in alignment with the organizational project management methodology – reviews project management processes and artifacts monthly to ensure project management methodology processes and instructions are followed, and templates used appropriately. **G**'s quality management assessors coach project managers, identify weaknesses in their work, and provide guidance on improving performance.

Best practices and lessons learned system / process is the second most common organizational project management methodology structure, appearing in the data 11 times by respondents from **B**, **C**, **D**, **F**, **G**, **H**, and **I**.

Respondents from **C** consider it the most common organizational project management methodology structure. Best practices and lessons learned system play an important role at **C**: Feedback, suggestions, and observations from **C**'s project managers and managers supervising implementation of projects provide suggestions for methodology development and maintenance. A team in charge of methodology development decides which of the proposed changes will be implemented.

Project reporting / reporting system is the third most common organizational project management methodology structure, appearing in the data eight times by respondents from **D**, **F**, **G**, and **J**. The project reporting system plays an important role at **D**: **D**'s organizational project management methodology describes mandatory and optional documents, including project reports, and ways in which project managers are expected to apply them according to common sense, experience and expertise and specific needs of individual projects.

Experience exchange system & events are the fourth most common organizational project management methodology structures, appearing in the data seven times by respondents from **E**, **G**, and **H**. Respondents from **H** consider them the most common organizational project management methodology structures. **H**'s organizational project management methodology relies on a multi-level project manager get-together system established for direct sharing of experiences.

Project / project manager support is the fifth most common organizational project management methodology structure, appearing in the data seven times by respondents from **E**, **F**, **G**, and **J**. The overall policy of **E**'s project management methodology is to provide support and guidance. **F**'s organizational project management methodology supports a safe way of working for most **F**'s projects, most of the time. **J** created specific project management structures and contents in order to provide support for specific project management needs in specific environments and circumstances.

5.2.2 Cross-case analysis of quantitative data

This subsection presents an analysis of quantitative data in order to identify the most important organizational project management methodology structures. The quantitative data, collected by surveying 53 respondents using a 1-to-10 rating scale, are shown in Table 78 and illustrated in Figure 26.

The data show the case organizations' unique emphases on structures in their organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

The data identify project management structure, cost / budget management system, schedule / time management system, risk management system, as well as reporting, communications and information system as the most important organizational project management methodology structures among the case organizations.

Furthermore, the data show unique organizational features, such as **A's** emphases on project and program management structures, **D's** emphases on cost / budget management system, issue / risk / decision register system, and benefits tracking / management system, **E's** emphasis on portfolio management structure, and **I's** emphasis on business processes.

Finally, the data reveal the case organizations' emphases on structures, such as cost, schedule, and risk managing systems, which are emphasized in public-domain and commercial project management methodologies, as well as on structures, such as product processes, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing project management challenges related to specific organizational and project contexts.

The following organizational project management methodology structures, identified as the most important among the case organizations, are analyzed further in the following paragraphs:

- project management structure
- cost / budget management system
- schedule / time management system
- risk management system
- reporting, communications & information system

Project management structure is the most important organizational project management methodology structure, with a mean importance score 8.91 on a 1-to-10 rating scale. Respondents from **A**, **E**, **G**, and **H** consider it the most important organizational project management methodology structure. The organization-specific importance scores range from 7.83 for **C** up to 9.67 for **A**.

Cost / budget management system is the second most important organizational project management methodology structure, with a mean importance score 8.30. Respondents from **F** consider it the most important organizational project management methodology structure. The organization-specific importance scores range from 6.83 for **E** up to 9.60 for **D**.

Schedule / time management system is the third most important organizational project management methodology structure, with a mean importance score 8.26. The organization-specific importance scores range from 7.00 for **E** up to 9.40 for **D**.

Risk management system is the fourth most important organizational project management methodology structure, with a mean importance score 8.08. The organization-specific importance scores range from 6.83 for **G** up to 9.40 for **D**.

Table 78: Quantitative data regarding the importance of the organizational project management methodology structures in a decreasing order of Mall, the mean of all responses. Bold typeface indicates high importance, underlining highest and lowest scores (cross-case).

organizational project management methodology structures	M _A	M _B	M _C	M _D	M _E	M _F	M _G	M _H	M _I	N _{all}	M _{all}	SD _{all}
project management structure	<u>9.67</u>	8,83	<u>7.83</u>	9,20	8,83	9.29	<u>9.50</u>	8,17	8,80	53	8,91	1,15
cost / budget management system	8.83	8,67	7,67	<u>9.60</u>	<u>6.83</u>	9.43	7,33	7,83	8,60	53	8,30	1,45
schedule / time management system	8.83	8,67	7,67	<u>9.40</u>	7,00	8,43	7,83	8,00	8.80	53	8,26	1,42
risk management system	7,83	8.67	7,50	<u>9.40</u>	7,83	8.43	<u>6.83</u>	8,00	8,40	53	8,08	1,54
reporting, communications & information system	8,33	8,33	7,83	8.60	<u>6.83</u>	8.71	8,33	<u>6.83</u>	8.40	53	8,02	1,51
project staff training & on-boarding system	7,80	8,00	8,00	<u>8.80</u>	8.50	7,50	7,83	<u>7.33</u>	8.50	50	8,00	1,26
scalable methodology (e.g. "light" & "standard")	<u>8.83</u>	8.33	8,00	8.60	7,33	8,43	7,33	<u>6.25</u>	7,00	48	7,83	1,92
quality management system	8,17	8.83	<u>4.80</u>	<u>9.40</u>	7,60	8,14	7,17	7,50	8.20	51	7,78	1,71
best practices & lessons learned recycling system	8.50	<u>8.67</u>	6,83	8.60	<u>6.67</u>	7,50	6,83	7,83	8,20	52	7,71	1,47
phase - gate / stage - gate structure	<u>9.00</u>	7,75	<u>3.60</u>	8.80	7,60	7,29	8,20	7,50	8.60	44	7,61	2,07
business processes / connection to business processes	8,67	7,40	<u>4.00</u>	8,60	6,50	8,67	8.83	6,17	<u>9.00</u>	48	7,60	2,11
methodology development & maintenance system	8,00	8,00	8,00	<u>8.40</u>	7,00	<u>6.17</u>	7,80	6,75	8,00	46	7,54	1,51
tailorable / applicable structures & contents	8,00	7,60	8.50	8.40	6,60	8.17	7,00	<u>6.50</u>	6,60	48	7,54	1,83
methodology use / project auditing system	7,33	7,83	8.17	<u>8.80</u>	6,40	7,57	8.20	<u>5.00</u>	7,80	50	7,48	1,47
issue / risk / decision register system	7,33	8.00	6,83	<u>9.60</u>	7,33	7,00	<u>6.33</u>	7,33	8.00	51	7,47	1,55
experience & knowledge sharing system / events	<u>8.83</u>	8.50	<u>6.00</u>	7.80	7,00	7,43	6,20	7,33	7,60	52	7,42	1,75
stakeholder management system	7.67	8.20	<u>6.33</u>	<u>9.00</u>	7,25	7,60	6,60	6,67	7,60	47	7,40	1,42
standard (PRINCE2 / PMI) methodology approach	8.17	7,00	6,17	<u>9.20</u>	<u>5.20</u>	6,00	8.17	7,00	7,80	48	7,23	1,91
customer feedback / satisfaction / care system	8,17	8.83	<u>4.00</u>	7,60	6,67	8.57	5,40	6,00	8.60	50	7,20	2,13
portfolio management structure	8,00	7,20	<u>3.60</u>	8.60	8.80	7,50	7,50	4,60	8.75	44	7,14	2,27
project support (e.g. "master" & "apprentice") system	7.75	<u>8.33</u>	<u>4.00</u>	7,60	7,00	7.71	6,20	7,50	7,00	46	7,11	1,76
modular methodology structure	7.83	8.00	<u>4.60</u>	<u>8.20</u>	7,00	6,00	6,50	6,25	7,20	41	6,88	2,06
program management structure	<u>9.00</u>	6,60	<u>4.00</u>	7.80	7,80	8.33	5,60	5,50	7,20	47	6,87	2,46
project (management) (complexity) evaluating system	6,80	7.80	6,25	7.80	6,00	<u>8.00</u>	5,33	<u>4.25</u>	7,40	46	6,72	2,19
choice of project life cycles (e.g. "waterfall" & "agile")	7.17	6,25	6,83	<u>8.50</u>	6,80	6,25	7.20	6,33	<u>4.80</u>	42	6,69	2,13
benefits tracking / management system	6,40	7.80	<u>3.00</u>	<u>9.20</u>	5,60	7.33	6,00	5,40	6,00	44	6,41	2,25
product processes / connection to product processes	7.50	6,80	4,33	<u>8.40</u>	6,40	5,75	8.20	<u>4.00</u>	7,00	43	6,35	2,26
case mean	8.12	8.01	<u>6.25</u>	<u>8.66</u>	7,07	7,81	7,22	6,63	7,80			

Reporting, communications and information system is the fifth most important organizational project management methodology structure, with a mean importance score 8.02. The organization-specific importance scores range from 6.83 for **E** and **H** up to 8.71 for **F**.

Quantitative cross-case analyses of groups of organizational project management methodologies – attached to this thesis as Appendix D – show differences between groups of methodologies:

The private case organizations' methodologies emphasize structures such as methodology development & maintenance system, and project (management) (complexity) evaluating system more than the public ones'.

The Finnish case organizations' methodologies emphasize structures such as customer feedback / satisfaction / care system, and program management structure more than the other ones'.

The ICT case organizations' methodologies emphasize structures such as benefits tracking / management system and customer feedback / satisfaction / care system less than the other ones'.

This suggests that the organizational project management methodology structures organizations use depend on project management challenges related to organizational and project contexts.

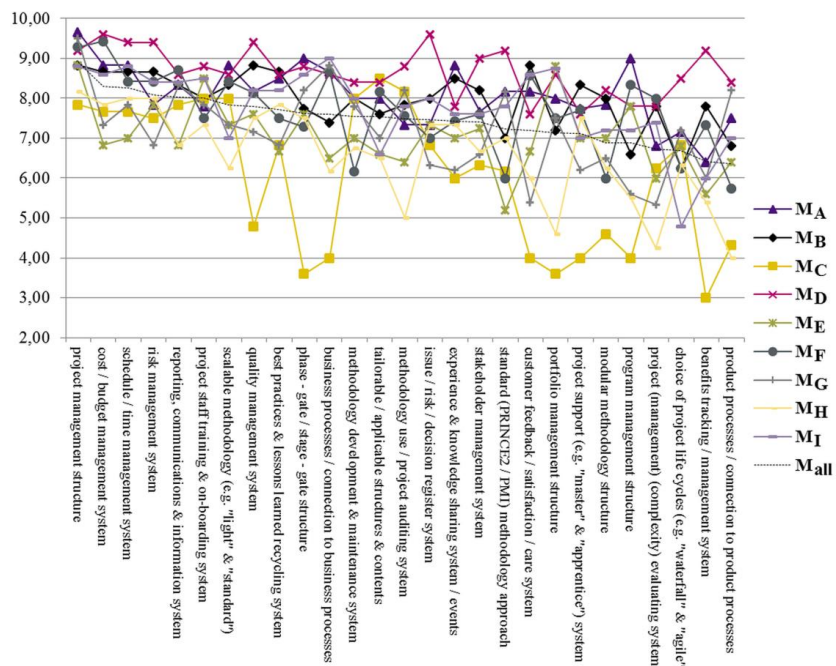


Figure 26: Quantitative illustration of the importance of the structures organizations use in organizational project management methodologies in a decreasing order of M_{all} , the mean of all responses

5.3 Organizational project management methodology contents

5.3.1 Cross-case analysis of qualitative data

This subsection presents an analysis of qualitative data in order to identify the most common organizational project management methodology contents. The qualitative data are shown in Table 79.

The data show the case organizations' unique use of contents in their organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

Table 79: Qualitative data regarding the contents organizations use in organizational project management methodologies in a decreasing order of Σ , the sum of organizational figures

organizational project management methodology contents	A	B	C	D	E	F	G	H	I	J	Σ
document templates and tools	6	7	10	4	5	7	6	7	6	5	63
process descriptions / guidelines	7	5	9	4	8	9	8	5	4	1	60
process diagram / framework	2	5	6	2	2	6	3	5	3	4	38
pm development / training / cert program & materials		3	3	2	5		6	4	5	3	31
project management tools / links thereto	3	5			2	4		2	2		18
project (control point) checklists	6	1		1	1	1	1	1	1	1	14
role definitions / descriptions	3	1	3	1	3	1					12
minimum & compliance requirements		2	4			1		1			8
project dashboard	1	1		1			2				5
risk management processes & tools	1			1		2					4
calculation sheets		1		2				1			4
project scheduling tools & processes		1		1				1			3
project phase inputs and outputs	1									1	2
project management handbook / manual		1			1						2

The data identify document templates and tools, process descriptions / guidelines, process diagram / framework, project management development / training / certification program and materials, and project management tools / links thereto as the most common organizational project management methodology contents among the case organizations.

Furthermore, the data show unique organizational features, such as **A's** use of process descriptions and guidelines, **B's** use of document templates and tools, **C's** use of document templates and tools, as well as process descriptions and guidelines, **E's** use of process descriptions and guidelines, **F's** use of document templates and tools, as well as process descriptions and guidelines, **G's** use of process descriptions and guidelines, and **H's** use of document templates and tools.

Finally, the data reveal the case organizations' use of organizational project management methodology contents, such as process descriptions and guidelines, which are emphasized in public-domain and commercial project management methodologies, as well as the use of contents, such as calculation sheets, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing project management challenges related to specific organizational and project contexts.

The following organizational project management methodology contents, identified as the most common among the case organizations, are analyzed further in the following paragraphs:

- document templates and tools
- process descriptions / guidelines
- process diagram / framework
- project management development / training / certification program & materials
- project management tools / links thereto

Document templates and tools are the most common organizational project management methodology contents, appearing in the data 63 times. Respondents from **B**, **C**, **H**, **I**, and **J** consider them the most common organizational project management methodology contents. Respondents from **C** mentioned them 10 times: **C**'s organizational project management methodology offers project managers document templates, examples of completed document templates, and detailed descriptions of document use.

Process descriptions / guidelines are the second most common organizational project management methodology contents, appearing in the data 60 times. Respondents from **A**, **E**, **F**, and **G** consider them the most common organizational project management methodology contents. Respondents from both **C** and **F** mentioned them 9 times: **C**'s organizational project management methodology was originally established on process-based PMI materials. **F**'s organizational project management methodology includes a project management framework which provides links to process descriptions.

Process diagram / framework is the third most common organizational project management methodology content, appearing in the data 38 times. Respondents from both **C** and **F** mentioned it six times: **C**'s project management framework includes defined project structures and overview of major activities, deliverables and expectations. **F**'s organizational project management methodology is built around a project management framework diagram, a central hub of information which illustrates the phase-gate

structure, identifies expected project status as project proceeds through phases, provides links to process descriptions, instructions and guidelines, as well as assigns tools and templates to be used in projects.

Project management development / training / certification program and materials are the fourth most common organizational project management methodology contents, appearing in the data 31 times. Respondents from **G** mentioned them six times: **G**'s organizational project management methodology follows PRINCE2. An organizational project management methodology operating manual forms the methodology core by providing an introduction to the methodology, and descriptions of organizational project phases, policies, procedures, roles, responsibilities, templates, forms, a project management checklist, and a workflow diagram as well as a glossary of terms and abbreviations.

Project management tools / links thereto are the fifth most common organizational project management methodology content, appearing in the data 18 times. Respondents from **B** mentioned them five times: **B**'s organizational project management methodology is organized into a matrix framework similar to that in the PMBOK Guide, and the framework cells are populated with links to tools, templates, descriptions, instructions and systems appropriate to each framework cell.

5.3.2 Cross-case analysis of quantitative data

This subsection presents an analysis of quantitative data in order to identify the most important organizational project management methodology contents. The quantitative data are shown in Table 80 and in Figure 27.

The data show the case organizations' unique emphases on contents in their organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

The data identify document templates, process descriptions and guidelines, role definitions and descriptions, project minimum / compliance requirements, and schedule / time management materials and instructions as the most important organizational project management methodology contents among the case organizations.

Furthermore, the data show unique organizational features, such as **A**'s emphases on document templates and process descriptions and guidelines, **B**'s emphases on project management tools as well as information on stakeholders and customers, **D**'s emphases on document templates, change management materials and instructions, project (management) dashboards, and project management / methodology quick guide, and **I**'s emphases on training materials and instructions and project (management) calculation sheets.

Finally, the data reveal the case organizations' emphases on contents, such as process descriptions and guidelines, which are emphasized in public-domain and commercial project management methodologies, as well as on contents, such as sales and marketing materials and instructions, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing project management challenges related to specific organizational and project contexts.

The following organizational project management methodology contents, identified as the most important among the case organizations, are analyzed further in the following paragraphs:

- document templates
- process descriptions and guidelines
- role definitions and descriptions
- project minimum / compliance requirements
- schedule / time management materials and instructions

Document templates are the most important organizational project management methodology contents, with a mean importance score 8.49 on a 1-to-10 rating scale. Respondents from **D** and **E** consider them the most important organizational project management methodology contents. The organization-specific importance scores range from 6.67 for **G** up to 9.80 for **D**.

Process descriptions and guidelines are the second most important organizational project management methodology content, with a mean importance score 8.42. Respondents from **G** consider them the most important organizational project management methodology contents. The organization-specific importance scores range from 7.50 for **H** up to 9.33 for **A**.

Role definitions and descriptions are the third most important organizational project management methodology contents, with a mean importance score 8.08. Respondents from **H** consider them the most important organizational project management methodology contents. The organization-specific importance scores range from 6.50 for **C** up to 8.80 for **D**.

Project minimum / compliance requirements are the fourth most important organizational project management methodology contents, with a mean importance score 7.90. The organization-specific importance scores range from 6.60 for **E** up to 8.83 for **F**.

Table 80: Quantitative data regarding the importance of the organizational project management methodology contents in a decreasing order of M_{all} , the mean of all responses. Bold typeface indicates high importance, underlining highest and lowest scores (cross-case).

organizational project management methodology contents	M_A	M_B	M_C	M_D	M_E	M_F	M_G	M_H	M_I	N_{all}	M_{all}	SD_{all}
document templates	9,33	8,17	8,50	9,80	9,33	9,00	<u>6,67</u>	7,17	8,60	53	8,49	1,63
process descriptions and guidelines	9,33	8,00	8,00	9,00	8,50	8,86	8,50	<u>7,50</u>	8,00	53	8,42	1,34
role definitions and descriptions	8,67	8,17	<u>6,50</u>	8,80	7,83	8,14	8,17	8,33	8,20	53	8,08	1,46
project minimum / compliance requirements	8,67	7,80	8,00	8,20	<u>6,60</u>	8,83	7,60	7,17	8,00	48	7,90	1,31
schedule / time management materials and instructions	8,50	8,33	6,80	9,00	<u>6,50</u>	8,43	7,17	7,33	8,80	52	7,87	1,58
risk management materials and instructions	8,17	7,83	7,33	9,00	7,83	8,29	<u>5,83</u>	7,50	8,40	53	7,77	1,47
cost / budget management materials and instructions	8,50	8,17	7,60	8,40	<u>5,50</u>	9,14	7,00	6,83	8,60	52	7,75	1,73
training materials and instructions	8,00	7,83	<u>6,17</u>	9,00	7,67	7,71	7,17	7,17	9,20	53	7,72	1,85
project management tools (or links thereto)	9,00	8,83	6,67	8,60	7,33	8,43	<u>5,83</u>	6,33	8,60	53	7,72	1,98
project (management) checklists	7,83	8,17	<u>5,67</u>	8,80	7,67	7,86	6,60	7,67	8,50	51	7,61	1,69
methodology framework ("big picture")	8,60	8,17	<u>6,50</u>	8,60	6,83	8,00	7,33	7,00	7,00	52	7,54	1,84
methodology tailoring / applying instructions	7,83	7,00	8,83	8,00	<u>6,00</u>	7,14	7,33	7,00	8,20	50	7,50	1,46
quality management materials and instructions	7,83	7,83	<u>5,00</u>	8,40	7,33	8,00	7,50	6,50	8,20	52	7,42	1,54
contracting / billing / invoicing materials & instructions	8,17	8,00	4,60	8,40	<u>4,00</u>	9,00	7,50	7,00	8,60	48	7,42	2,21
expected phase inputs and outputs	8,67	7,75	<u>6,17</u>	8,40	6,50	6,60	7,50	7,33	8,00	49	7,41	1,58
project management / methodology quick guide	6,83	7,60	<u>5,50</u>	9,20	7,40	8,00	<u>7,20</u>	6,80	8,50	48	7,40	2,09
change management materials and instructions	9,17	7,60	6,67	9,60	7,33	7,17	<u>5,50</u>	6,33	7,60	51	7,39	1,95
financing materials and instructions	8,00	7,80	6,50	7,75	<u>4,00</u>	8,86	6,80	6,50	7,00	45	7,18	1,95
process diagrams	8,17	6,33	<u>5,33</u>	9,00	7,33	8,00	7,17	6,67	6,40	53	7,15	1,89
project (management) dashboards	7,83	8,20	<u>5,17</u>	9,60	6,00	6,60	7,00	6,20	8,50	48	7,15	2,16
project (management) calculation sheets	8,17	8,00	<u>4,20</u>	7,60	5,80	7,50	6,20	8,00	9,00	46	7,11	2,02
project management / methodology handbook / manual	7,50	7,67	<u>5,17</u>	8,80	6,50	7,00	6,83	6,00	8,67	48	7,02	1,98
decision-making materials and instructions	7,67	7,00	5,83	8,40	6,80	7,17	<u>5,25</u>	6,50	7,75	47	6,94	1,74
resource planning materials and instructions	<u>7,67</u>	7,17	6,20	7,40	7,00	7,29	<u>5,00</u>	6,67	7,60	51	6,88	1,84
information on stakeholders and customers	7,67	8,80	<u>4,33</u>	8,60	5,00	7,86	4,67	6,00	6,80	51	6,61	2,39
health, safety and environmental materials	6,00	7,83	<u>1,67</u>	6,40	4,80	7,86	4,50	5,25	8,80	44	6,27	2,44
sales and marketing materials and instructions	8,00	6,67	<u>1,67</u>	6,50	4,00	7,00	2,67	3,83	7,67	42	5,67	2,70
case mean	8,15	7,80	<u>6,12</u>	8,51	6,70	7,96	6,64	6,79	8,10			

Schedule / time management materials and instructions are the fifth most important organizational project management methodology contents, with a mean importance score 7.87. The organization-specific importance scores range from 6.50 for **E** up to 9.00 for **D**.

Quantitative cross-case analyses of groups of organizational project management methodologies – attached to this thesis as Appendix D – show differences between groups of methodologies:

The private case organizations' methodologies emphasize contents such as sales and marketing materials and instructions, and change management materials and instructions more than the public ones'.

The Finnish case organizations' methodologies emphasize contents such as sales and marketing materials and instructions, and health, safety and environmental materials more than the other ones'.

The ICT case organizations' methodologies emphasize contents such as health, safety and environmental materials, and information on stakeholders and customers less than the other ones'.

This suggests that the organizational project management methodology contents organizations use depend on project management challenges related to organizational and project contexts.

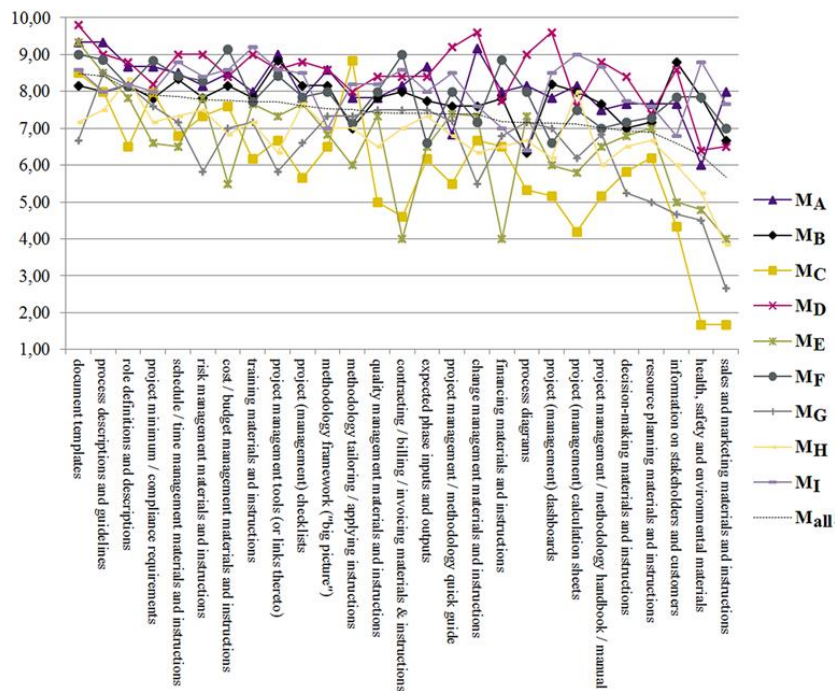


Figure 27: Quantitative illustration of the importance of the contents organizations use in organizational project management methodologies in a decreasing order of *M_{All}*, the mean of all responses

5.4 Reasons why organizations use organizational project management methodologies

5.4.1 Cross-case analysis of qualitative data

This subsection presents an analysis of qualitative data in order to identify the most common reasons why organizations use organizational project management methodologies. The qualitative data are shown in Table 81.

The data show the case organizations' unique reasons to use organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

The data identify provides / enables a common way of working, recycles best practices and lessons learned, avoids re-inventing the wheel, enables and enhances project management and reaching agreed targets, provides structure, prevents chaos, and provides sales and marketing assistance, shows reputation as the most common reasons why the case organizations use organizational project management methodologies.

Furthermore, the data show unique organizational features, such as **A** using the methodology to provide / enable a common way of working, **B** using the methodology to provide / enable a common way of working, **C** to recycle best practices and lessons learned, avoid re-inventing the wheel, **D** to provide structure, prevent chaos, and to standardize projects, provide consistency, **F** to provide / enable a common way of working, and to enable and enhance project management and reaching agreed targets, **G** to enable / enhance development of project management skills, and **H** to provide sales and marketing assistance, show reputation.

Finally, the data reveal the case organizations' use of organizational project management methodologies for reasons such as provides / enables a common way of working, which are emphasized in public-domain and commercial project management methodologies, as well as for reasons such as integrates / aligns / harmonizes project management with business processes, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing project management challenges related to specific organizational and project contexts.

Table 81: Qualitative data regarding the specific reasons why organizations use organizational project management methodologies in a decreasing order of Σ , the sum of organizational figures

reasons to use organizational project management methodologies	A	B	C	D	E	F	G	H	I	J	Σ
provides / enables a common way of working	8	8	4	5	5	6	4	3	3	1	47
recycles BP & LL, avoids re-inventing the wheel	5	3	7	3	3	4	1	3	2		31
enables and enhances project management and reaching agreed targets	3	1	4	1	3	6	4	1	2	1	26
provides structure, prevents chaos	1	2	3	9	1	1	3	1	2		23
provides sales & marketing assistance, shows reputation	3	1	2	1		3	1	7	1	3	22
enhances communication, comprehension, reporting & info exchange			4	2	1	3	5	1	1	1	18
enables / enhances development of project management & pm skills	1	3	4	1	1	1	6		1		18
enables on-boarding of new staff	1	3	3		1	2	1	2	3		16
enables / enhances project commensurability		2	1	1	3	3	3		1		14
enables exchange / sharing of project personnel	2	2	3	2	3	1		1			14
enhances risk management		2	3			1	1	1	1	4	13
enables keeping & focusing on customer promises	3	1	1	1		1	1			4	12
enhances quality / quality management	5			1		3		1	1	1	12
standardizes projects, provides consistency		2	3	6			1				12
provides / establishes common language / vocabulary	1	3	1		1		2	1	2		11
enhances project efficiency & effectiveness	2	1		1	5		1	1			11
optimizes resource / personnel usage					1	2	1	2	2	2	10
enhances chances of project success	1	1	1	3	1			2		1	10
enhances schedule management, saves time					1	2		1		4	8
enhances cost management, saves money	1					3		1		3	8
eliminates / reduces project unpredictability & randomness	1	1		1	1	1				1	6
integrates / aligns / harmonizes project management with business processes	2								4		6
highlights potential pitfalls	2					1	1	1	1		6
reduces overhead costs / increases revenue	1		1	2		1		1			6
enables & enhances business forecasting & managing business risk	3	1		1			1				6
enables project governance					1	2	2				5
provides project management framework	1								2	1	4
enhances co-operation between different cultures & projects	1	1			1			1			4
enables & enhances experience & knowledge sharing	1		3								4
enables / enhances portfolio management		1					1		1		3
enhances project culture		1		1					1		3
defines project roles	1		1						1		3
enhances project staff capabilities				1	1		1				3
improves & enhances focus on safety				1		1		1			3
introduces new project management methods				2	1						3
provides a way of working required for certification & auditing (CMMI)	1			1	1						3
provides common tools & methods		1			2						3
provides support to project manager	2	1									3
enables decentralized way of working	2										2
sets minimum expected practice level		2									2
enables demonstrating & enhancing compliance & following regulations			2								2
provides checklists						2					2
provides escalation path in case of problems							2				2
provides connections to project management systems						1			1		2
enables making profit from projects						1			1		2
ensures appropriate decision making							1		1		2

The following specific reasons why organizations use organizational project management methodologies, identified as the most common among the case organizations, are analyzed further in the following paragraphs:

- provides / enables a common way of working
- recycles best practices and lessons learned, avoids re-inventing the wheel
- enables and enhances project management and reaching agreed targets
- provides structure, prevents chaos
- provides sales & marketing assistance, shows reputation

Provides / enables a common way of working is the most common reason why organizations use organizational project management methodologies, appearing in the data 47 times. Respondents from **A** and **B** consider it the most common reason to use an organizational project management methodology, both **A**'s and **B**'s respondents mentioning it eight times: One of the main reasons **A** originally established an organizational project management methodology was to establish a common way of working throughout the organization. **B**'s top management realized – when starting an organizational unit which focuses on customer projects – that a common, systematic, effective and efficient way of managing large complex projects in a global business environment was required.

Recycles best practices & lessons learned, avoids re-inventing the wheel is the second most common reason why organizations use organizational project management methodologies, appearing in the data 31 times. Respondents from **C** consider it the most common reason to use an organizational project management methodology. At **C** feedback, suggestions, and observations identify maintenance needs.

Enables and enhances project management and reaching agreed targets is the third most common reason why organizations use organizational project management methodologies, appearing in the data 26 times. Respondents from **F** mention it 6 times: **F** is satisfied with the organizational project management methodology performance and the benefits it provides: A safe way of working for most **F**'s projects, most of the time.

Provides structure, prevents chaos is the fourth most common reason why organizations use organizational project management methodologies, appearing in the data 23 times. Respondents from **D** consider it the most common reason to use an organizational project management methodology, mentioning it nine times: **D**'s organizational project management methodology includes an in-house certification system, in which the first certification level focuses on theoretical aspects of the methodology, ensuring

users understand the basic structures, processes and contents. The second certification level is experience-based and focuses on methodology details and interpreting and adaptively applying the methodology according to specific needs of individual projects.

Provides sales & marketing assistance, shows reputation is the fifth most common reason why organizations use organizational project management methodologies, appearing in the data 22 times. Respondents from **H** consider it the most common reason to use an organizational project management methodology, mentioning it nine times: One of the motives in developing **H**'s organizational project management methodology was to provide potential customers and clients with evidence of **H** as a trustworthy and professional participant in international projects.

5.4.2 Cross-case analysis of quantitative data

This subsection presents an analysis of quantitative data in order to identify the most important reasons why organizations use organizational project management methodologies. The quantitative data are shown in Table 82, and illustrated in Figure 28.

The data show the case organizations' unique emphases on reasons why organizations use organizational project management methodologies: Similarities exist, however, no two methodologies can be described as alike.

The data identify provides a common way of working, provides structure to projects, standardizes projects and provides consistency, provides common project language / vocabulary, and enhances quality of project management as the most important reasons why the case organizations use organizational project management methodologies.

Table 82: Quantitative data regarding the importance of the reasons why organizations use organizational project management methodologies in a decreasing order of M_{all} , the mean of all responses. Bold typeface indicates high importance, underlining highest and lowest scores (cross-case).

reasons to use organizational project management methodologies	M_A	M_B	M_C	M_D	M_E	M_F	M_G	M_H	M_I	N_{all}	M_{all}	SD_{all}
provides a common way of working	9,33	8,17	8,83	8,80	8,83	9,14	10,0	<u>7,83</u>	8,80	53	8,87	1,08
provides structure to projects	8,67	8,33	<u>7,33</u>	9,00	8,67	8,14	8,17	8,33	8,40	53	8,32	1,27
standardizes projects and provides consistency	8,50	8,00	8,00	9,20	8,17	9,14	8,00	<u>7,50</u>	8,40	53	8,32	1,13
provides common project language / vocabulary	8,00	8,40	8,67	8,80	8,33	8,14	8,50	<u>7,17</u>	8,40	52	8,25	1,31
enhances quality of project management	8,67	8,50	<u>6,50</u>	7,80	8,83	9,14	7,50	8,33	8,00	53	8,17	1,33
avoids "re-inventing the wheel"	8,67	8,00	8,67	8,60	7,33	8,29	7,50	<u>7,17</u>	8,20	53	8,04	1,29
enhances organizational project management	7,67	<u>7,33</u>	8,20	8,00	9,00	8,71	7,83	7,50	7,80	52	8,02	1,47
enhances risk management	8,00	8,33	7,17	8,20	7,67	9,14	<u>7,00</u>	8,33	7,40	53	7,94	1,52
enhances chances of project success	8,17	7,67	<u>6,83</u>	8,40	7,33	8,14	7,50	8,33	7,80	53	7,79	1,16
enhances project (planning) effectiveness	8,33	7,00	<u>5,17</u>	8,60	8,17	8,43	7,83	7,83	8,40	53	7,74	1,65
enhances schedule management	7,67	7,83	<u>6,00</u>	8,20	7,50	8,86	7,67	7,33	8,20	53	7,70	1,49
enhances reaching of agreed targets	7,83	8,83	6,67	7,60	7,67	8,14	<u>6,50</u>	7,83	8,00	53	7,68	1,51
enhances reporting & information sharing	7,33	8,00	8,17	7,60	7,33	7,57	<u>7,00</u>	7,50	8,40	53	7,64	1,39
develops project staff project management skills	7,50	7,67	<u>6,00</u>	9,25	8,00	7,86	7,00	7,50	7,80	52	7,56	1,43
recycles best practices and lessons learned	8,33	7,67	6,83	8,80	7,67	7,00	<u>6,33</u>	7,50	7,60	53	7,49	1,41
enhances quality of project deliverable	8,00	7,67	<u>6,50</u>	7,40	7,83	7,29	<u>6,50</u>	7,83	7,80	53	7,42	1,38
enhances project (implementation) efficiency	8,00	6,67	<u>5,17</u>	8,40	7,50	7,71	7,50	7,50	8,40	53	7,40	1,66
enables quick "on-boarding" of new project staff	8,17	7,50	8,50	7,80	<u>6,17</u>	7,29	6,67	6,17	8,40	53	7,38	1,92
enhances cost management	7,50	7,83	6,33	7,80	<u>5,50</u>	8,86	7,17	7,33	7,60	53	7,34	1,76
prevents chaos in projects	7,50	7,50	<u>6,67</u>	8,20	7,17	7,14	6,67	7,33	7,40	53	7,26	1,82
enhances communications & information exchange	6,83	7,50	8,33	7,60	7,17	7,29	6,83	7,67	<u>5,80</u>	53	7,25	1,58
enhances keeping of customer promises	8,17	7,83	<u>5,33</u>	7,00	6,00	7,86	6,67	6,83	8,40	53	7,11	1,80
eliminates project unpredictability & randomness	7,33	7,17	<u>5,67</u>	7,60	7,50	7,57	7,17	6,83	8,80	53	7,08	1,80
optimizes use & management of project resources	6,33	6,50	5,40	6,80	<u>5,00</u>	8,14	7,17	7,33	6,40	51	6,65	1,86
allows evaluating & comparing of project issues	7,50	7,67	<u>4,67</u>	6,80	5,83	8,00	5,50	6,33	7,00	53	6,60	1,94
enables exchanging and sharing of project staff	7,17	6,67	6,33	7,50	6,50	6,71	5,60	<u>5,33</u>	7,20	51	6,53	2,06
shows reputation and assists sales & marketing	7,67	7,17	4,33	7,60	<u>2,00</u>	6,43	2,80	6,40	6,60	45	6,00	2,50
case mean	7,88	7,68	<u>6,80</u>	8,05	7,32	8,01	7,09	7,37	7,76			

Furthermore, the data show unique organizational features, such as **A's** emphasis on providing a common way of working, **B's** emphasis on enhancing reaching of agreed targets, **D's** emphases on standardizing projects and providing consistency, as well as developing project staff project management skills, and **G's** emphasis on providing a common way of working.

Finally, the data reveal the case organizations' emphases on reasons why organizations use organizational project management methodologies, such as providing a common way of working, which are emphasized in public-domain and commercial project management methodologies, as well as on reasons why organizations use organizational project management methodologies, such as showing reputation and assisting sales and marketing, which are scarcely covered in public-domain and commercial project management methodologies, but required for addressing specific project management challenges related to organizational and project contexts.

The following reasons why organizations use organizational project management methodologies, identified as most important among the case organizations, are analyzed further in the following paragraphs:

- provides a common way of working
- provides structure to projects

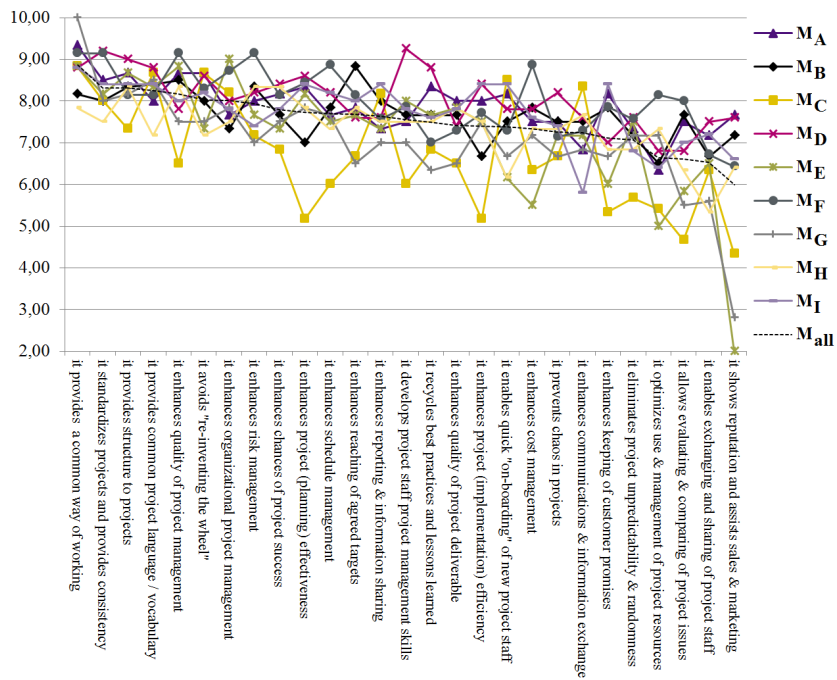


Figure 28: Quantitative illustration of the importance of the reasons why organizations use organizational project management methodologies in a decreasing order of Mall, the mean of all responses

- standardizes projects and provides consistency
- provides common project language / vocabulary
- enhances quality of project management

Provides a common way of working is the most important reason why organizations use organizational project management methodologies, with a mean importance score 8.87 on a 1-to-10 rating scale. Respondents from **A**, **C**, **G**, and **I** consider it the most important reason why their organizations use organizational project management methodologies. The organization-specific importance scores range from 7.83 for **H** up to 10.0 for **G**.

Provides structure to projects is the tied second most important reason why organizations use organizational project management methodologies, with a mean importance score 8.32. The organization-specific importance scores range from 7.33 for **C** up to 9.00 for **D**.

Standardizes projects and provides consistency is the tied second most important reason why organizations use organizational project management methodologies, with a mean importance score 8.32. The organization-specific importance scores range from 7.50 for **H** up to 9.20 for **D**.

Provides common project language / vocabulary is the fourth most important reason why organizations use organizational project management methodologies, with a mean importance score 8.25. The organization-specific importance scores range from 7.17 for **H** up to 8.80 for **D**.

Enhances quality of project management is the fifth most important reason why organizations use organizational project management methodologies, with a mean importance score 8.17. The organization-specific importance scores range from 6.50 for **C** up to 9.14 for **F**.

Quantitative cross-case analyses of groups of organizational project management methodologies – attached to this thesis as Appendix D – show differences between groups of methodologies:

The private case organizations' methodologies emphasize reasons such as it shows reputation and assists sales & marketing, and it enables quick "on-boarding" of new project staff more than the public ones'.

The Finnish case organizations' methodologies emphasize reasons such as it allows evaluating and comparing of project issues, and it enhances keeping of customer promises more than the other ones'.

The ICT case organizations' methodologies emphasize reasons such as it shows reputation and assists sales and marketing, and it allows evaluating and comparing of project issues less than the other ones'.

This suggests reasons why organizations use organizational project management methodology depend on project management challenges related to organizational and project contexts.

5.5 Organizational project management methodologies' connections to research findings

This section provides a summary of the investigated organizational project management methodologies and their connections to research findings. Table 83 shows the main qualitative findings: Most common organizational project management methodology structures and contents, and reasons why case organizations use these methodologies. Table 84 shows the main quantitative findings: Most important organizational project management methodology structures and contents, and reasons why case organizations use these methodologies.

A is a private Finnish business organization operating in ICT business area. Serving in-house and external project customers, **A**'s project portfolio contains several hundred projects with a total combined budget of several hundred million €. **A** initiated the deployment of an organizational project management methodology in early 1980s to achieve a common way of working, to enhance project management quality, and to increase project throughput. **A**'s organizational project management methodology is based on PMI PMBOK Guide and project management challenges related to organizational and project contexts.

B is a private Finnish business organization operating in engineering, production, and service business area. Serving external project customers, **B**'s project portfolio contains over 350 projects with a total combined budget of over 700 million €. **B** initiated the deployment of an organizational project management methodology in late 1990s to achieve a common, systematic, effective and efficient way of managing large complex projects in global business environment. **B**'s organizational project management methodology is based on PMI PMBOK Guide and project management challenges related to organizational and project contexts.

C is a private North American business organization operating in ICT business area. Serving in-house project customers, **C**'s project portfolio contains over 250 projects with a total combined budget of over 320 million €. **C** initiated the deployment of an organizational project management methodology in late 1990s to achieve a common way of working and a common project structure, and to increase project consistency and repeatability across the family of organizations. **C**'s organizational project management methodology is based on PMI PMBOK Guide, GAPPS materials, a commercial project management methodology, and project management challenges related to organizational and project contexts.

Table 83: Summary of the main qualitative findings of this research: The most common structures, contents, and reasons why case organizations use organizational project management methodologies

case	structures	contents	reasons why used
A	<ul style="list-style-type: none"> customer care system billing / invoicing system change management system decision making structure 	<ul style="list-style-type: none"> process descriptions and guidelines document templates and tools project control point checklists 	<ul style="list-style-type: none"> provides a common way of working recycles best practices and lessons learned, avoids reinventing wheel enhances quality management
B	<ul style="list-style-type: none"> auditing procedure and system best practices and lessons learned recycling system phase / gate structure program and portfolio management structure 	<ul style="list-style-type: none"> document templates and tools process descriptions and guidelines process diagrams and frameworks project management tools 	<ul style="list-style-type: none"> provides a common way of working recycles best practices and lessons learned, avoids reinventing wheel enhances development of project management skills enables on-boarding of new staff provides common language / vocabulary
C	<ul style="list-style-type: none"> best practices and lessons learned recycling system 	<ul style="list-style-type: none"> document templates and tools process descriptions and guidelines process diagrams and frameworks minimum and compliance requirements 	<ul style="list-style-type: none"> recycles best practices and lessons learned, avoids reinventing wheel provides a common way of working enhances project management and reaching of agreed targets enhances development of project management skills enhances communication, reporting and information exchange
D	<ul style="list-style-type: none"> risk / issue / decision registers project reporting system benefits tracking system 	<ul style="list-style-type: none"> document templates and tools process descriptions and guidelines 	<ul style="list-style-type: none"> provides structure, prevents chaos standardizes project, provides consistency provides a common way of working
E	<ul style="list-style-type: none"> experience exchange system and events project manager support 	<ul style="list-style-type: none"> process descriptions and guidelines document templates and tools project management development / training / certification program and materials 	<ul style="list-style-type: none"> provides a common way of working enhances project efficiency and effectiveness
F	<ul style="list-style-type: none"> auditing procedures and systems project manager support customer care system communication processes and systems light methodology version 	<ul style="list-style-type: none"> process description and guidelines document templates and tools process diagrams and frameworks project management tools 	<ul style="list-style-type: none"> provides a common way of working enhances project management and reaching of agreed targets recycles best practices and lessons learned, avoids reinventing wheel
G	<ul style="list-style-type: none"> auditing procedures and system best practices and lessons learned recycling system experience exchange system and events project cost control system on-boarding system quality management system 	<ul style="list-style-type: none"> process descriptions and guidelines document templates and tools project management development / training / certification program and materials process diagrams and frameworks 	<ul style="list-style-type: none"> enhances development of project management skills enhances communication, reporting and information exchange provides a common way of working enhances project management and reaching of agreed targets
H	<ul style="list-style-type: none"> experience exchange system and events stakeholder management and information system 	<ul style="list-style-type: none"> document templates and tools process descriptions and guidelines process diagrams and frameworks 	<ul style="list-style-type: none"> provides sales and marketing assistance, shows reputation provides a common way of working recycles best practices and lessons learned, avoids reinventing wheel
I	<ul style="list-style-type: none"> auditing procedure and system best practices and lessons learned system phase / gate structure 	<ul style="list-style-type: none"> document templates and tools project management development / training / certification program and materials process descriptions and guidelines 	<ul style="list-style-type: none"> aligns project management with business processes provides a common way of working enables on-boarding of new staff
J	<ul style="list-style-type: none"> project reporting system project manager support 	<ul style="list-style-type: none"> document templates and tools process diagrams and frameworks project management development / training / certification program and materials 	<ul style="list-style-type: none"> enhances risk management enhances schedule management enables keeping of and focusing on customer promises

Table 84: Summary of the main quantitative findings of this research: The most important structures, contents, and reasons why case organizations use organizational project management methodologies

case	structures	contents	reasons why used
A	<ul style="list-style-type: none"> project management structure phase / gate structure program management structure 	<ul style="list-style-type: none"> process descriptions and guidelines document templates change management materials and instructions 	<ul style="list-style-type: none"> provides a common way of working avoids “re-inventing the wheel” provides structure to projects enhances quality of project management
B	<ul style="list-style-type: none"> project management structure quality management system customer care system 	<ul style="list-style-type: none"> project management tools information on stakeholders and customers time schedule management materials and instructions 	<ul style="list-style-type: none"> enhances reaching of agreed targets enhances quality of project management provides common project language / vocabulary
C	<ul style="list-style-type: none"> tailorable / applicable structures and contents methodology use / project auditing system 	<ul style="list-style-type: none"> methodology tailoring / applying instructions document templates process descriptions and guidelines project minimum / compliance requirements 	<ul style="list-style-type: none"> provides a common way of working avoids “re-inventing the wheel” provides common project language / vocabulary
D	<ul style="list-style-type: none"> cost / budget management system issue / risk / decision register system 	<ul style="list-style-type: none"> document templates change management materials and instructions project management dashboards 	<ul style="list-style-type: none"> develops project staff project management skills standardizes projects and provides consistency provides structure to projects
E	<ul style="list-style-type: none"> project management structure portfolio management structure project staff training and onboarding system 	<ul style="list-style-type: none"> document templates process descriptions and guidelines risk management materials and instructions role definitions and descriptions 	<ul style="list-style-type: none"> enhances organizational project management provides a common way of working enhances quality of project management
F	<ul style="list-style-type: none"> cost / budget management system project management structure reporting, communications and information system 	<ul style="list-style-type: none"> cost / budget management materials and instructions document templates contracting / billing / invoicing materials & instructions 	<ul style="list-style-type: none"> provides a common way of working enhances quality of project management standardizes projects and provides consistency enhances risk management
G	<ul style="list-style-type: none"> project management structure business processes / connection to business processes reporting, communications and information system 	<ul style="list-style-type: none"> process descriptions and guidelines role definitions and descriptions project minimum / compliance requirements 	<ul style="list-style-type: none"> provides a common way of working provides common project language / vocabulary provides structure to projects
H	<ul style="list-style-type: none"> project management structure schedule / time management system risk management system 	<ul style="list-style-type: none"> role definitions and descriptions project management calculation sheets project management checklists 	<ul style="list-style-type: none"> provides structure to projects enhances quality of project management enhances chances of project success enhances risk management
I	<ul style="list-style-type: none"> business processes / connection to business processes project management structure schedule / time management system portfolio management structure 	<ul style="list-style-type: none"> training materials and instructions project management calculation sheets schedule / time management materials and instructions health, safety, and environmental materials 	<ul style="list-style-type: none"> provides a common way of working
J*			

* Organization J only participated in the first phase of this research

D is a private African business organization operating in project management consulting business area. Serving external project customers, **D**'s project portfolio contains over 150 projects with a total combined budget of over 650 million €. **D** initiated the deployment of an organizational project management methodology in late 1990s to achieve a consistent common way of managing projects, a common set of expected project management artifacts, as well as continuity and ability to exchange and replace people if necessary. **D**'s organizational project management methodology is based on PMI PMBOK Guide, ISO standards, AACE materials, and project management challenges related to organizational and project contexts.

E is a public Finnish not-for-profit organization operating in ICT business area. Serving in-house project customers, **E**'s project portfolio contains over 100 projects with a total combined budget of tens of millions €. **E** initiated the deployment of an organizational project management methodology in mid 1980s to avert committee work ineffectiveness. **E**'s organizational project management methodology is based on project management challenges related to organizational and project contexts.

F is a public Finnish not-for-profit organization operating in multidisciplinary research business area. Serving in-house and external project customers, **F**'s project portfolio contains approximately 2700 projects with a total combined budget of approximately 270 million €. **F** initiated the deployment of an organizational project management methodology in 1980s to achieve increased project management formality, align research projects with applicable quality standards, and improve project management professionalism. **F**'s organizational project management methodology is based on project management challenges related to organizational and project contexts.

G is a public European not-for-profit organization operating in ICT business area. Serving in-house project customers, **G**'s project portfolio contains over 70 projects with a total combined budget of over 20 million €. **G** initiated the deployment of an organizational project management methodology in 2010 to enhance project management maturity, enhance project management foundations, and improve project ability to provide agreed results. **G**'s organizational project management methodology is based on PRINCE2 and project management challenges related to organizational and project contexts.

H is a public European not-for-profit organization operating in multidisciplinary research business area. Serving in-house and external project customers, **H**'s project portfolio contains over 1000 projects with a total combined budget of over 600 million €. **H** initiated the deployment of an organizational project management methodology in 1980s to enhance project

structure, to provide support to project managers, and to coordinate and manage **H**'s participation in projects of extreme size and complexity. **H**'s organizational project management methodology is based on IPMA materials, PMI PMBOK Guide, and project management challenges related to organizational and project contexts.

I is a private Finnish business organization operating in engineering, production, and service business area. Serving external project customers, **I**'s project portfolio contains over 200 projects with a total combined budget of over 5400 million €. **I** initiated the deployment of an organizational project management methodology in 2007 to align project management practices within the business group. **I**'s organizational project management methodology is based on commercial project management methodology and project management challenges related to organizational and project contexts

J is a private Finnish business organization operating in engineering, production, and service business area. Serving external project customers, **J**'s project portfolio contains approximately 20 projects with a total combined budget of approximately 300 million €. **J** initiated the deployment of an organizational project management methodology in 1999 to achieve a group-wide best-practice-based common way of working. **J**'s organizational project management methodology is based on project management challenges related to organizational and project contexts.

The findings suggest that organizations use unique combinations of organizational project management methodology structures and contents when they address the specific reasons to use such methodologies. This indicates there is no single best way to manage projects.

The findings also suggest that the structures and contents organizations use in organizational project management methodologies, as well as the reasons for methodology use, depend on project management challenges such as a strict decision-making scheme, and a demanding time schedule, which relate to organizational and project contexts. Organizations with similar organizational and project contexts are more likely to have similar organizational project management methodologies than organizations with different organizational and project contexts.

Furthermore, the findings suggest that organizations focus their project management methodologies on to project management subject areas in which they find most room for improvement, and which they consider most likely to enhance project effectiveness and efficiency, and to improve chances of project success. Organizations are able to recognize such areas from organizational and project contexts, and from project management challenges and achievements. For example private business organizations, such as **A**, **B**, **C**, **D**, **I**, and **J**, use and emphasize structures, contents, and

reasons why organizations use organizational project management methodologies having commercial nature, such as showing reputation and assisting sales and marketing, more than the public not-for-profit organizations, such as **E**, **F**, **G**, and **H**. Similarly, organizations serving external project customers, such as **A**, **B**, **D**, **I**, and **J**, use and emphasize structures, contents, and reasons why organizations use organizational project management methodologies having customer care nature, such as customer care system, information on stakeholders and customers, and keeping of customer promises, more than organizations, such as **C**, **E**, and **G**, serving in-house project customers only.

Finally, the findings suggest that organizations adopt ideas for organizational project management methodology structures and contents, and for reasons to use such methodologies from public-domain and commercial project management methodologies, and from project management challenges related to organizational and project contexts. Organizations **A**, **B**, **C**, **D**, **G**, **H**, and **I** developed, or currently maintain their organizational project management methodologies by building on public-domain and commercial project management methodologies as well as on project management challenges related to organizational and project contexts: PMI PMBOK Guide is used by **A**, **B**, **C**, **D**, and **H**; IPMA materials were used by **H**; PRINCE2 materials are used by **G**; ISO standards and AACE materials are used by **D**. Commercial project management methodologies are used by **C** and **I**. Organizations **E**, **F**, and **J** developed their organizational project management methodologies on project management challenges related to organizational and project contexts only.

6. Discussion and conclusions

This chapter presents a discussion of the theoretical contributions and managerial implications from this research, an evaluation of this research, and directions for future research.

This research investigated organizational project management methodologies by focusing on their structures and contents, and specific reasons why organizations use them. Three research questions were posed:

RQ 1: What structures do organizations use in organizational project management methodologies ?

RQ 2: What contents do organizations use in organizational project management methodologies ?

RQ 3: Why do organizations use organizational project management methodologies ?

Qualitative data were collected and analyzed within-case and cross-case to identify the most common organizational project management methodology structures and contents, and the most common reasons why organizations use organizational project management methodologies.

Building on the qualitative findings, quantitative data were collected and analyzed within-case and cross-case in order to identify the most important organizational project management methodology structures and contents, and the most important reasons why organizations use organizational project management methodologies.

This chapter contains four main sections:

- 6.1 Theoretical contributions
- 6.2 Managerial implications
- 6.3 Evaluation of this research
- 6.4 Directions for future research

6.1 Theoretical contributions

This section presents the contributions this research provides to the scholarly knowledge of organizational project management methodologies.

6.1.1 Organizational project management methodology structures and contents, and reasons why such methodologies are used

This research identified auditing procedures and systems, best practices and lessons learned systems, project reporting systems, experience exchange systems and events, and project support systems as the most common, and project management structure, cost and budget management system, time schedule management system, risk management system, and reporting, communications, and information system as the most important organizational project management methodology structures.

Additionally, this research recognized document templates and tools, process description and guidelines, process diagrams and frameworks, project management development materials, and project management tools as the most common, and document templates, process descriptions and guidelines, role definitions and descriptions, project minimum and compliance requirements, and time schedule management materials and instructions as the most important organizational project management methodology contents.

Further to this, this research showed that providing a common way of working, recycling best practices and lessons learned, enhancing reaching of agreed targets, providing structures and preventing chaos, providing sales and marketing assistance and showing reputation are the most common, and providing a common way of working, providing structure to projects, standardizing projects and providing consistency, providing a common project language and vocabulary, and enhancing quality of project management the most important reasons why organizations use organizational project management methodologies.

These results align with, and expand what Cormier (2001), Charvat (2003), Powell and Young (2004), Kerzner (2006), Hill (2008), Wells (2012), Kerzner (2013), Wells (2013), and Joslin and Müller (2014) described as project management methodology structures and contents, and the reasons why organizations use project management methodologies.

6.1.2 Organizational project management methodologies' uniqueness

The findings of this research suggest that each organization uses a unique combination of specific project management methodology structures and contents to address similarly unique combination of specific reasons to use such a methodology.

The findings allowed identifying the most common organizational project management methodology structures and contents, and the most common reasons why organizations use such methodologies. Also the most important organizational project management methodology structures and contents, and the most important reasons why organizations use such methodologies were identified. Regardless of this, a study of the case organizations' organizational project management methodologies suggests organizational project management methodologies are unique.

Organizational project management methodologies' uniqueness is suggested by the findings regarding the use of organizational project management methodology structures: The most common structures were identified, however, results scatter outside the most common structures, except for the occasional organizational indication of common use of a specific structure, such as issue, risk, and decision registers at **D**. The same phenomenon was observed in the ways in which organizations emphasized the importance of organizational project management methodology structures: Most important structures were identified, however, results scatter outside the most important structures, except for the occasional organizational indication of high importance of a specific structure, such as phase – gate structure and program management structure at **A**, quality management system, issue, risk, and decision register system, standard methodology approach, as well as benefits tracking and management system at **D**, and business processes at **I**. Among the most important organizational project management methodology structures, such as project management structure, the differences in between the organization-specific importance scores were small compared to the less important organizational project management methodology structures, such as program management structure, portfolio management structure, as well as product processes.

Organizational project management methodologies' uniqueness is also suggested by the findings regarding the use of organizational project management methodology contents: The most common contents were identified, however, results scatter outside the most common contents, except for the occasional organizational indication of common use of a specific content, such as project checklists and role definitions and descriptions at **A**, role definitions and descriptions and minimum and compliance require-

ments at **C**, and role definitions and descriptions at **E**. The same phenomenon was observed in the ways in which organizations emphasized the importance of organizational project management methodology contents: Most important contents were identified, however, results scatter outside the most important contents, except for the occasional organizational indication of high importance of a specific content, such as project management tools and change management materials and instructions at **A**, project dashboards, change management materials and instructions, project management methodology quick guide, training materials and instructions as well as cost and budget management materials and instructions at **D**, cost and budget management materials and instructions and contracting, billing, and invoicing materials and instructions at **F**, and training materials and project calculations sheets at **I**. Among the most important organizational project management methodology contents, such as minimum and compliance requirements, the differences in between organization-specific importance scores were small compared to the less important organizational project management contents, such as sales and marketing materials and instructions, health, safety, and environmental materials, as well as information on stakeholders and customers.

Organizational project management methodologies' uniqueness is further suggested by the findings regarding the reasons why organizations use such methodologies: The most common reasons why organizations use organizational project management methodologies were identified, however, results scatter outside the most common reasons, except for the occasional organizational indication of common reason to use an organizational project management methodology, such as enhancing quality and quality management at **A**, standardizing projects and providing consistency at **D**, enhancing project efficiency and effectiveness at **E**, and enhancing communication, comprehension, reporting and information exchange as well as enabling and enhancing development of project management and project management skills at **G**. The same phenomenon was observed in the ways in which organizations emphasized the importance of reasons why organizational project management methodologies are used: Most important reasons why organizations use organizational project management methodologies were identified, however, results scatter outside the most important reasons, except for the occasional organizational indication of high importance of a specific reason to use an organizational project management methodology, such as developing project staff project management skills at **D**, enhancing organizational project management at **E**, and enhancing risk management at **F**. Among the most important reasons why organizations use organizational project management methodologies, such as providing a common

way of working, the differences in between organization-specific importance scores were small compared to the less important reasons why organizations use organizational project management methodologies, such as allowing evaluating and comparing of project issues, enabling exchanging and sharing of project staff, as well as showing reputation and assisting sales and marketing.

The conclusion that organizational project management methodologies are unique relates to the conclusion that organizations structure and populate, and use organizational project management methodologies for the reasons which organizations consider appropriate for enhancing project effectiveness and efficiency, and for improving the chances of project success: The reasons why organizations use organizational project management methodologies identify the specific benefits organizations expect from organizational project management. Organizational project management methodology structures identify the frameworks and systems organizations use for organizing and coordinating the achieving of the expected benefits. Organizational project management methodology contents identify the tools, techniques, methods, and ways of working organizations use for achieving the expected benefits. Organizational project management methodologies can be considered structured descriptions of organizational project management in project-based organizations.

The conclusion that organizational project management methodologies are unique explains the findings regarding the diverse ways in which organizations implement organizational project management. The conclusion aligns with the *one-size-does-not-fit-all* concept introduced by Shenhar, Dvir, Levy and Maltz (2001) and Shenhar (2001), and subsequently enhanced by Shenhar and Dvir (2004) and Shenhar, Dvir, Milosevic, Mulenburg, Patanakul, Reilly, Ryan, Sage, Sauser, Srivannaboon, Stefanovic, and Thamhain (2005) up until Shenhar and Dvir (2007). Morris (2013) criticized the diamond model by Shenhar and Dvir (2004; 2007), however, based on the findings of this research, and the conclusion that organizational project management methodologies are unique, the *one-size-does-not-fit-all* concept appears more appropriate than the contrary *one-size-fits-all* view by Gschoßmann and Weber (2009).

This confrontation requires further reflection regarding differences and similarities of project management: Viewed from afar, from the perspective of public-domain project management methodologies such as the PMBOK Guide (Duncan, 1996; PMI, 2000; 2004; 2008, 2013a) and PRINCE2 (OGC, 2005; OGC, 2009), project management appears similar and void of details. Viewed from nearby, from the perspective of commercial project management methodologies such as UPMM (IIL, 2014) and XLPM (SPM,

2014), details can be seen. A close-up view from the perspective of an organizational project management methodology reveals a great number of distinctive details, as illustrated in this thesis. The unique nature of project management may be seen as depending on the chosen perspective and how detailed a view is available from the this perspective: Looking from a distance and seeing scarce details project management may appear common and homogenous, however, taking a closer look and seeing a great number of distinctive details reveals project management as highly heterogeneous. In projects these differences appear as contexts, targets, and ways of working. In project management methodologies these differences appear as the structures, contents, and reasons why an organizational project management methodology is used. Organizational maturity and project management maturity may also explain the differences among organizational project management, and organizational project management methodologies.

The conclusion that organizational project management methodologies are unique suggests that there is no one single best way to manage projects: The best way to manage projects depends on project management challenges, which reflect the organizational and project contexts. This conclusion may be seen as an extension of the contingency theory, originally proposed by Woodward (1958), and subsequently developed by Burns and Stalker (1961) and Chandler (1962), who asserted that there is no single management style which is best for all organizations in view of their internal and external contingencies. The contingency thinking has since been expanded by Lawrence and Lorsch (1967), who claimed that the better the fit between the environmental needs and the organizational conditions, the better the organization would perform, Mintzberg (1979b) who found that organizational success depends on combination of approaches as opposed to an individual one. Drazin and Van de Ven (1985) later noted that the "... concepts of fit may be applied not only to structural contingency theory but to contingency theories in general. Fit is a concept of broad utility that is increasingly important in a wide range of organizational theories" (p. 537). The conclusion that there is no one single best way to manage projects further suggest that a contingency theory of project organizations may be established following contingency theory of organizations. Similarly, a contingency theory of project management may be established following general contingency theory. This suggestion aligns with the views of Anbari (1985), Bredillet (2007a; 2007b; 2007c; 2008a; 2008b; 2008c; 2010), Söderlund (2002; 2004a; 2004b; 2011), Jugdev (2008), and Turner, Huemann, Anbari, and Bredillet (2010) who describe the *contingency school of project management thought* as one of the potential foundations towards a theory – or one of many according to Morris (2002) – of project manage-

ment. This aligns, furthermore, with the Koskela and Howell call for further research in order to better understand and further refine project management (Koskela & Howell, 2002a), and their assertion that an intimate connection between project management theory and practice is needed (Koskela & Howell, 2002b).

Donaldson (1987; 2001) introduced the concept of *Structural Adaptation to Regain FIT (SARFIT)* to the contingency theory discourse: Organizations seeking high performance need to maintain a state of fit with their internal and external contingencies. When contingencies change, the state of fit deteriorates, and organizational properties need to be adjusted in order to regain the state of fit. This is what happens with organizations operating organizational project management methodologies: Organizations monitor the performance of their organizational project management methodologies: When the fit between organizations' needs and methodologies deteriorates, organizations tailor their organizational project management methodologies in order to regain fit. Project management staffs apply the organizational project management methodologies adaptively in order to further enhance the fit between the methodology and the project contexts.

6.1.3 Organizational and project contexts' connection to organizational project management methodologies

The findings of this research suggest that the structures and contents organizations use in organizational project management methodologies, as well as the reasons why organizations use organizational project management methodologies, reflect the project management challenges which relate to organizational and project contexts.

The cross-case analyses of groups of organizational project management methodologies in Appendix D identify differences and similarities in how important juxtaposing groups of case organizations consider organizational project management methodology structures and contents, and reasons why organizations use such methodologies. Regardless of organizational project management methodologies' uniqueness, a cross-case study of the case organizations' organizational project management methodologies suggest organizational and project contexts have a distinct effect on organizational project management methodologies.

Organizational and project contexts' connection to organizational project management methodologies is suggested by findings regarding how juxtaposing groups of case organizations emphasize organizational project management methodology structures: The private case organizations' methodologies emphasize structures such as methodology development and

maintenance system, project evaluating system, as well as methodology use and project auditing system more than the public case organizations' organizational project management methodologies. The Finnish case organizations' methodologies emphasize structures such as customer feedback, satisfaction, and care system, program management structure, as well as portfolio management structure more than the other case organizations' organizational project management methodologies. The ICT case organizations' methodologies emphasize structures such as benefits tracking and management system, customer feedback, satisfaction, and care system, as well as quality management system less than the other case organizations' organizational project management methodologies. These findings suggest that the organizational project management methodology structures organizations use depend on project management challenges, which relate to organizational and project contexts.

Organizational and project contexts' connection to organizational project management methodologies is also suggested by findings regarding how juxtaposing groups of case organizations emphasize organizational project management methodology contents: The private case organizations' methodologies emphasize contents such as sales and marketing materials and instructions, change management materials and instructions, as well as project management tools more than the public case organizations' organizational project management methodologies. The Finnish case organizations' methodologies emphasize contents such as sales and marketing materials and instructions, health, safety, and environmental materials and instructions, as well as project management tools more than the other case organizations' organizational project management methodologies. The ICT case organizations' methodologies emphasize health, safety, and environmental materials, information on stakeholders and customers, as well as contracting, billing, and invoicing materials and instructions less than the other case organizations' organizational project management methodologies. These findings suggest that the organizational project management methodology contents organizations use depend on project management challenges, which relate to organizational and project contexts.

Organizational and project contexts' connection to organizational project management methodologies is further suggested by findings regarding the reasons why organizations use such methodologies: The private case organizations' methodologies emphasize reasons such as showing reputation and assisting sales and marketing, enabling quick "on-boarding" of new project staff, as well as enabling exchanging and sharing of project staff more than the public case organizations' organizational project management methodologies. The Finnish case organizations' organizational project management

methodologies emphasize reasons such as allowing evaluating and comparing of project issues, enhancing keeping of customer promises, as well as enhancing quality of project management more than the other case organizations' organizational project management methodologies. The ICT case organizations methodologies emphasize reasons such as showing reputation and assisting sales and marketing, allowing evaluating and comparing of project issues, as well as enhancing cost management less than the other case organizations' organizational project management methodologies. These findings suggest that the reasons why organizations use organizational project management methodologies depend on project management challenges, which relate to organizational and project contexts.

Organizational and project contexts involve contingencies much more complex than the simplified system investigated in this research. These contexts are unique for each organization and for each project, and affect organizational project management as well as organizational project management methodologies, and make it difficult – if not impossible – to assess the exact ways and extents to which any single specific contingency affects organizational project management and organizational project management methodologies. Crawford, Hobbs, and Turner (2005) presented a categorization system for organizations and projects: The proposed categories, including *sector*, *geographical location*, and *application area*, can be considered as contingencies on to which several organizational and project attributes can be classified.

The findings of this research suggest that a connection exists between organizational project management methodologies and organizational and project contexts. Unfortunately the findings do not allow identifying how exactly this connection works, other than to say that organizations strive to use methodology structures and contents, and to use the methodologies for reasons which the organizations consider most likely to enhance project effectiveness and efficiency, and to improve the chances of project success.

The conclusion that organizational and project contexts influence organizational project management methodologies fits Snowden's *Cynefin Framework* (Kurtz & Snowden, 2003; Snowden, 2005; Snowden & Boone, 2007): A *simple* project may be managed by following a light project management methodology; a *complicated* project may be managed by following a regular project management methodology; a *complex* project may be managed by following a project management methodology with emergent practices, such as *Agile*. *Chaotic* projects are beyond the reach of most organizational project management methodologies.

The conclusion also fits contingency theory (Woodward, 1958; Burns & Stalker, 1961; Chandler, 1962; Lawrence & Lorsch, 1967; Mintzberg, 1979;

Drazin & Van de Ven, 1985; Donaldson, 1987; Donaldson, 2001): Organizational project management methodologies are unique, however, not structured, populated, or used randomly: Organizational project management methodologies are developed, operated, and maintained so that the structures, contents, and reasons for using such methodologies fit one another, as well as the project management challenges, and enhance project effectiveness and efficiency, and improve the chances of project success. Organizational project management methodologies which are developed, operated, and maintained under similar contexts are likely to have similar properties; organizational project management methodologies which are developed, operated, and maintained under different contexts are likely to have different properties; organizational project management methodologies which are developed, operated, and maintained under juxtaposing contexts are likely to have juxtaposing properties.

The conclusion that organizational and project contexts have a connection to organizational project management methodologies suggests that a contingency theory of project management may be established following Anbari (1985), Bredillet (2007a; 2007b; 2007c; 2008a; 2008b; 2008c; 2010), Söderlund (2002; 2004a; 2004b; 2010), Jugdev (2008), and Turner, Huemann, Anbari, and Bredillet (2010) who describe the *contingency school of project management thought* as one of the potential foundations towards a theory of project management.

6.1.4 Organizational project management methodologies' foci

The findings of this research suggest that organizations focus their project management methodologies on to project management subject areas in which they find most room for improvement, and which they consider most likely to enhance project effectiveness and efficiency, and to improve the chances of project success: Organizations identify such areas from project management challenges related to organizational and project contexts, and tailor organizational project management methodology structures, contents, and reasons why such methodologies are used so that methodologies provide the expected benefits.

The within-case analyses of organizational project management methodologies in Chapter 4 describe ways of working with which organizations identify organizational project management methodology structures and contents, as well as reasons for using such methodologies which address the project management challenges organizations consider most important for enhancing project effectiveness and efficiency, and for improving the chances of project success: The structures, contents, and reasons for meth-

odology use organizations consider most important are emphasized in organizational project management methodologies, whereas less significant structures, contents, and reasons for methodology use are emphasized less, and sometimes omitted from methodologies.

A's organizational project management methodology is developed and maintained through a continuous process of monitoring advances in project management research, following new materials released by independent authors and national as well as international organizations, performing gap analysis in between expected and actual results, and collecting feedback, best practices, lessons learned, and new ideas from project management staff. These inputs are used when deciding on major methodology updates and minor enhancements to methodology structure and contents.

B's organizational project management methodology is maintained by two parallel processes: As **B's** strategy is updated, organizational project management methodology is reviewed to ensure methodology ability to provide expected results throughout the customer project delivery procedure. Parallel to this, project management stakeholders from different organizational functions analyze available practical knowledge, including feedback, best practices, lessons learned and new ideas looking for new structures and contents likely to enhance methodology performance.

C's organizational project management methodology is maintained by releasing an update biannually based on methodology sections identified as requiring updating, and best practices and lessons learned identified as having potential to enhance methodology performance. Feedback and suggestions from practicing project managers, observations from managers supervising implementation of projects, changes in organizational governance framework, and corporate reorganizations are mainly responsible for methodology maintenance needs. The team in charge of the methodology decides and approves the changes in each methodology update.

D's organizational project management methodology is maintained by a continuous process of collecting feedback, best practices, and lessons learned from methodology users and stakeholders, new findings from research, and new ideas, structures and contents from international institutes, organizations and associations. Organizational project management methodology developers use several individual and interactive review techniques to decide how the methodology is updated in each release.

E's organizational project management methodology is maintained by continuously collecting best practices, lessons learned, and new ideas from methodology users, and analyzing them in order to find out how to fine tune the methodology. Advances in project management research, and new materials released by authors and international organizations are used as

input for major developments to the methodology. Maintenance and development are undertaken by project management coordination group, which proposes changes to the methodology to a project management steering group that approves the proposed maintenance and development issues.

F's organizational project management methodology is monitored by **F's** financial, quality, and R&D departments performing a continuous 360° assessment of methodology results. There is also a continuous process for collecting and analyzing feedback and ideas from project practitioner events, and feedback, best practices and lessons learned from projects. When sufficient grounds exist, steps are taken to update the methodology.

G's organizational project management methodology is maintained by continuously collecting practical knowledge, including best practices and lessons learned from methodology users, and analyzing them in monthly meetings of a project management forum. In these meetings project managers evaluate development ideas and agree which ones are investigated further and which ones are finally adopted into the methodology. A new version of the methodology, with enhancements as decided by the project management forum, is released biannually.

H's generic project management methodology is maintained by a small project management support staff at **H's** headquarters that both provides operative project support and develops organizational project management. Individual research offices have been developing, maintaining and fine-tuning semi-specific and specific methodology variants according to available feedback, best practices and lessons learned. There is a multi-level project manager get-together system established for direct sharing and collecting of experiences. A continuous process for collecting feedback, best practices and lessons learned is expected to be launched when the new methodology version is released.

I's organizational project management methodology is maintained by an organizational project management office through two parallel continuous processes: Minor updates are implemented following practical feedback including best practices and lessons learned from the projects using the methodology. Major methodology revamps and upgrades are undertaken according to advances in project and project management research, advances in project and project management practitioner literature, as well as enhancements to the project management methodology platform by the provider of the commercial project management methodology platform.

J's group-level generic project management methodology is maintained by the group headquarters. A methodology use manager, who owns the project management process, decides the small-scale methodology enhancements at **J**, updating specific methodology components to increase con-

sistency, to integrate feedback, best practices and lessons learned from the field, and to fix any deficits which might be found in the methodology. Project management best practices and lessons learned, as well as methodology feedback are collected at each project close-out.

The within-case analyses of organizational project management methodologies in Chapter 4 identify structures, such as methodology development and maintenance system, tailorable and applicable structures and contents, as well as methodology use and project auditing system, and contents such as methodology tailoring and applying instructions which organizations use to enhance organizational ability to focus organizational project management methodologies on to key project management challenges. With these structures and contents organizations monitor methodology performance, and undertake methodology development and maintenance as necessary to ensure organizational project management methodologies provide support and assistance in project management subject areas where they are most needed, and in areas which are considered most likely to enhance project effectiveness and efficiency, and to improve the chances of project success.

Organizational project management methodologies focus on the project management subject areas which organizations consider most important through methodology tailoring (OGC, 2009; Whitaker, 2012; Bergman, Gunnarson & Räisänen, 2013; PMI, 2013a; PMI, 2014). Organizations develop and maintain methodology structures and contents, and seek benefits fitting the project management challenges, which reflect the organizational and project contexts. Through extensive tailoring organizational project management methodologies become highly distinctive, and in extreme cases it may be difficult to identify the foundations or platforms on which an organizational project management methodology was originally built.

This tailoring, which may take place continuously, incrementally at predetermined time schedules, and incrementally as needed, is what Donaldson refers to as *Structural Adaptation to Regain Fit (SARFIT)* (Donaldson, 1987; 2001): The better the fit between organizational project management challenges and organizational project management methodologies, the better the organizational project management methodologies are able to enhance project efficiency and effectiveness, and to improve the chances of project success.

While organizations are encouraged to tailor public-domain and commercial project management methodologies to enhance the fit between the project management challenges and the organizational project management methodologies (OGC, 2009; PMI, 2013a), organizations should consider the point of inflection identified by Cheema and Shahid (2005), Milosevic and Patanakul (2005), and Hurt and Thomas (2009): Organizations seek-

ing high performance may establish matching policies regarding the extent to which organizational project management methodologies are tailored, and the extent to which project management staffs are allowed and expected to adaptively apply organizational project management methodologies.

6.1.5 Ideas for organizational project management methodology development and maintenance

The findings of this research suggest that organizations adopt ideas for organizational project management methodology structures and contents, and for reasons for using such methodologies from public-domain and commercial project management methodologies, as well as from project management challenges related to organizational and project contexts.

The within-case analyses of organizational project management methodologies in Chapter 4 indicate organizations **A, B, C, D, G, H, and I** build on public-domain foundations and commercial project management methodology platforms, however, also rely on project management challenges related to organizational and project contexts: **A, B, C, D, and H** build on PMI PMBOK Guide; **H** originally built on IPMA materials; **G** builds on PRINCE2; **D** builds on PMI PMBOK Guide, ISO standards, and AACE materials. **C** and **I** build on commercial project management methodology platforms. Organizations **E, F, and J** developed, and currently maintain their organizational project management methodologies by mainly following the project management challenges related to organizational and project contexts.

Adoption of ideas for organizational project management methodology structures, contents, and reasons for using such methodologies from public-domain and commercial project management methodologies as well as project management challenges related to organizational and project contexts indicates organizational motivation to standardize project management methodology structures, contents, and reasons for using such methodologies. This is often the case with organizations providing project and project management services, deliveries, and consultation to external customers. Despite the motivation to standardize organizational project management, such organizations seldom use public-domain and commercial project management methodologies exactly as they are out-of-the-box: Methodologies are tailored by adopting ideas for methodology structures, contents, and reasons for using such methodologies from project management challenges related to organizational and project contexts. This allows organizations use standard structures, contents, and reasons for using such

methodologies, and to tailor them so that they fit the project management challenges related to organizational and project contexts. The tailoring converts public-domain and commercial project management methodologies into organizational project management methodologies: The better the fit between organizational project management methodologies and project management challenges, the better the methodologies' abilities to enhance project effectiveness and efficiency, and to improve the chances of project success.

Adoption of ideas for organizational project management methodology structures, contents, and reasons for using such methodologies only from project management challenges related to organizational and project contexts indicates organizational motivation to achieve highly effective and efficient project management structures, contents, and reasons for using such methodologies without standardizing them. This is often the case with organizations procuring project as well as project management services, deliveries, and consultation from external providers and suppliers. A limited motivation to standardize organizational project management often results in organizational project management methodologies which are highly unique in structures, contents, and reasons why such methodologies are used. Organizational project management methodologies built only on project management challenges related to organizational and project contexts may achieve a high degree of fit with project management challenges, however, may suffer from lack of clear structure and operating logic.

It is sometimes difficult to identify organizational project management methodology backgrounds – whether an organizational project management methodology was built on public-domain or commercial project management methodologies as well as project management challenges, as opposed to having been built on project management challenges only: Organizational project management methodologies built on public-domain and commercial project management methodologies may have signs of the background tailored out of the methodology. Similarly, organizational project management methodologies built on project management challenges only may be so tailored that they come to bear resemblance to public-domain and commercial project management methodologies.

Public-domain project management methodologies are initially established, and subsequently revised by building on project management challenges as described by project management practitioners (Morris, Patel & Wearne, 2000; Morris, Jamieson & Shepherd, 2006; OGC, 2009; PMI, 2013a). Commercial project management methodologies are initially established, and subsequently revised by building on a combination of public-domain project management methodologies, and project management chal-

lenges as described by project management practitioners (IIL, 2014; SPM, 2014). The findings of this research suggests that organizational project management methodologies are initially established, and subsequently revised by building on a combination of public-domain project management methodologies, commercial project management methodologies, and project management challenges related to organizational and project contexts as described by project management practitioners, however, when project management standardization is not considered key, organizational project management methodologies may be built directly on project management challenges related to organizational and project contexts. This aligns with, and extends the research by Cicmil & Hodgson (2006), Crawford (2006), Crawford and Helm (2009), Ingason & Jónasson (2009), McHugh and Hogan (2011), Montes-Guerra, Gimena, Pérez-Ezcurdia, and Díez-Silva (2014).

Public-domain project management methodologies, commercial project management methodologies, and organizational project management form a complex project management knowledge and experience recycling system: Public-domain and commercial project management methodologies form the core of this system. It is built, tested, and revised based on a stream of information available from organizational project management surrounding the system core. Project management practitioners test the structures, contents, and reasons to use project management methodologies. The ones that are found effective are integrated more strongly into the system core, circulated and refined more strongly in the practice of project management in organizations, and adopted and adapted into organizational project management methodologies. The ones that are not found useful are discarded, and ejected from the system.

6.2 Managerial implications

This section presents the contributions this research provides to the practical knowledge of organizational project management methodologies.

This research identified auditing procedures and systems, best practices and lessons learned systems, project reporting systems, experience exchange systems and events, and project support systems as the most common, and project management structure, cost and budget management system, time schedule management system, risk management system, and reporting, communications, and information system as the most important organizational project management methodology structures.

Additionally, this research recognized document templates and tools, process description and guidelines, process diagrams and frameworks, project management development materials, and project management tools as the most common, and document templates, process descriptions and guidelines, role definitions and descriptions, project minimum and compliance requirements, and time schedule management materials and instructions as the most important organizational project management methodology contents.

Further to this, this research showed that providing a common way of working, recycling best practices and lessons learned, enhancing reaching of agreed targets, providing structures and preventing chaos, providing sales and marketing assistance and showing reputation are the most common, and providing a common way of working, providing structure to projects, standardizing projects and providing consistency, providing a common project language and vocabulary, and enhancing quality of project management the most important reasons why organizations use organizational project management methodologies.

The findings of this research are likely to benefit organizations developing and maintaining public-domain and commercial project management methodologies for other organizations' benefit, as well as organizations developing, using, and maintaining organizational project management methodologies for their own benefit. Also organizations providing project management consultation, education, and training may find these findings useful.

The findings of this research align with, and expand what OGC (2009), ISO (2012), PMI (2013a), PMI (2014), IIL (2014), and SPM (2014) described as organizational project management methodology structures and contents, and reasons why organizations use such methodologies.

The findings of this research show that the case organizations participating in this research are satisfied with their organizational project management methodologies' ability to provide the expected benefits. This contradicts Wells' (2012) interpretation of the 2010 CHAOS report (Standish Group, 2010) which she sees as identifying project management methodologies as one of the top ten factors contributing towards project failure. This also contradicts Wells' (2012) finding that project management methodologies are non-beneficial and hinder project delivery.

The findings of this research, the within-case and cross-case analyses of case organizations' organizational project management methodologies presented in this thesis, and the conclusions drawn from the findings are not to be understood as identifying any case organization's organizational project management methodology as superior, or inferior, compared to the other organizational project management methodologies investigated in this research. Despite the similarities and differences in organizational project management methodology structures and contents, and reasons why organizations use organizational project management methodologies, and the similarities and differences in how important organizations consider specific organizational project management methodology structures and contents, and reasons why organizations use organizational project management methodologies, all organizational project management methodologies investigated in this research were described as being successful and providing the expected benefits.

Some project management subject areas which are considered central to project management, such as scope management, appear scarcely in the findings of this research. This may be due to the case organizations considering these subject areas less important than what is believed, organizations dealing with these subject areas in ways other than their organizational project management methodologies, and organizations considering these subject areas so integral to organizational project management that they are taken for granted. Similarly, some project management subject areas which have been recently introduced to the project management scene, such as Agile ways of working, environmental concerns, and sustainable development, appear scarcely in the findings. This may be due to the case organizations taking their time to adopt new ideas and concepts in to organizational project management methodologies, and this may reflect the tendency which organizational project management methodologies have towards being conservative, and emphasizing well-proven concepts, tools, and ways of working.

6.3 Evaluation of this research

This section presents an evaluation of this research, reflecting on the way in which this research was undertaken, and the way in which the research results are applicable.

6.3.1 Introduction

The quality of this research is evaluated by focusing on a selection of criteria for evaluating this mixed-methods multiple case study research. Yin (2009) suggested researchers use *construct validity*, *internal validity*, *external validity*, and *reliability* to demonstrate the quality of empirical social research. This section includes an introduction and four subsections. The four subsections are:

6.3.2 Construct validity

6.3.3 Internal validity

6.3.4 External validity

6.3.5 Reliability

6.3.2 Construct validity

Construct validity refers to “identifying correct operational measures for the concepts being studied” (Yin, 2009, p. 40), and is concerned with the “extent to which your measurement questions actually measure the presence of those constructs you intend them to measure” (Saunders, Lewis & Thornhill, 2012, p. 668). Parkhe (1993), Miles and Huberman (1994) and Yin (2009) noted case study research strategy is often criticized for developing inadequately operational measures, and for using insufficiently objective judgment in data collection. Yin (2009) suggested three tactics for ensuring construct validity in case study research: *Using multiple sources of evidence* and *establishing a chain of evidence* in data collection phase, and *having key informants review research report draft* in composition phase. These three tactics were followed in this research.

Multiple sources of evidence were targeted by seeking eight case organizations to participate in this research: The case organizations were carefully selected to represent different sectors, different business areas, and different national cultures. Multiple sources of evidence were also targeted by inviting six respondents from each case organization to participate in this research: Two participants representing organizational project management methodology developers, two representing organizational project

management methodology users, and two representing managers in charge of organizational project management methodology development and use. Multiple sources of evidence were also targeted by using two data types – qualitative from semi-structured interviews and quantitative from a questionnaire – in order to achieve a thorough and balanced understanding of organizational project management methodologies.

A chain of evidence is established by publishing the respondents' responses to key qualitative questions, and summaries of respondents' responses to quantitative instruments in this thesis, and by building from the raw data toward results of this research with one set of within-case analyses and several sets of cross-case analyses, and by presenting the findings and conclusions of this research so that a clear and unbroken chain of evidence connects the raw data to the findings and onto the conclusions.

Furthermore, the liaison from each case organization was provided a draft version of the qualitative data-based within-case analysis for checking information accuracy, for confirming no information the case organization did not want disclosed was included in the material, and for ensuring sufficient organizational anonymity. Draft versions of the quantitative organizational results were provided correspondingly to the liaisons subsequent to the quantitative analyses.

6.3.3 Internal validity

Internal validity refers to “seeking to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships” (Yin, 2009, p. 40), and is concerned with the “extent to which findings can be attributed to interventions rather than any flaws in your research design” (Saunders, Lewis & Thornhill, 2012, p. 673). Yin (2009) suggested four tactics for ensuring internal validity in case study research: *Doing pattern matching*, *doing explanation building*, *addressing rival explanations*, and *using logic models* in the data analysis phase, however, asserted testing internal validity is intended “for explanatory or causal studies only and not for descriptive or exploratory studies” (Yin, 2009, p. 40). As this research is exploratory, and there is no intention to identify causal patterns, this line of evaluating the quality of research design is not followed here.

6.3.4 External validity

External validity refers to “defining the domain to which a study’s findings can be generalized” (Yin, 2009, p. 40), and is concerned with the “extent to which the research results from a particular study are generalizable to all relevant contexts” (Saunders, Lewis & Thornhill, 2012, p. 671). External validity is often considered the weak spot of case study research, especially with a single case research strategy, following thinking a single case offers poor foundation for generalizing. Yin (2009) defends case study research by noting ...

... such critics are implicitly contrasting the situation to survey research, in which a sample is intended to generalize to a larger universe. *This analogy to samples and universes is incorrect when dealing with case studies.* Survey research relies on *statistical* generalization, whereas case studies (as with experiments) rely on *analytic* generalization. In analytic generalization, the investigator is striving to generalize a particular set of results to some broader theory ... (Yin, 2009, p. 43, emphases and brackets in original text)

Yin (2009) suggested two tactics for ensuring external validity in case study research: *Using theory in single case studies*, and *using replication logic in multiple case studies* in the research design phase. Replication logic is similar to the logic used in performing multiple experiments: The cases to be investigated are selected so that each case provides supporting results through *literal replication*, or contrasting results for anticipated reasons through *theoretical replication*. Replication logic was used in this research by seeking eight organizations with carefully chosen contexts – public and private sectors, Finnish and other national cultures, and ICT and other business areas – to participate in this research, and by performing within-case and cross-case analyses of the collected qualitative and quantitative data.

6.3.5 Reliability

Reliability refers to “demonstrating that the operations of a study – such as the data collection procedures – can be repeated, with the same results” (Yin, 2009, p. 40), and is concerned with the “extent to which data collection technique or techniques will yield consistent findings, similar observations would be made or conclusions reached by other researchers or there is transparency in how sense was made from the raw data” (Saunders, Lewis & Thornhill, 2012, 680). Yin (2009) suggested two tactics for ensuring reliability in case study research: *Using case study protocol* and *developing*

case study database in the data collection phase. Yin (2009) asserted reliability strives to ensure that if another researcher later repeats the same study, the latter researcher should achieve the same results, and reminded “... the emphasis is on doing the *same* case over again, not on ‘replicating’ the results of one case by doing another case study” (Yin, 2009, p. 45, emphasis in original text).

A multiple case study protocol was used in the qualitative data collection to ensure interviews covered relevant themes and were performed in a way which addressed multiple case study research reliability needs. The protocol included an *introduction of the case study and the purpose of the protocol*, a description of *data collection procedures*, an *outline of the case study report*, and open-ended *case study questions* as suggested by Yin (2009). The case study protocol is attached to this thesis as Appendix B.

A questionnaire was used in the quantitative data collection to ensure the survey covered relevant themes and was performed in a standardized way which addresses multiple case study research reliability needs. The questionnaire included specific sections for assessing structures, contents, and reasons why organizations use organizational project management methodologies. The questionnaire is attached to this thesis as Appendix C.

A case study database, for archiving the original digital audio recordings of the semi-structured interviews, scanned copies of field notes taken at the interviews, the original versions of the within-case descriptions sent to the case organizations, the amended – based on the comments received from a key respondent at each case organization – versions of the within-case descriptions, the questionnaires sent to the respondents and the replies received from the respondents, was created before commencing data collection, and maintained and populated throughout this research.

The quantitative and the qualitative findings of this research have similarities, however, also substantial differences. A fundamental reason why the qualitative findings differ from the quantitative findings is that the qualitative findings indicate the most common organizational project management methodology structures and contents, and reasons why organizations use organizational project management methodologies – as recalled by respondents – whereas the quantitative findings identify the importance of structures, contents, and reasons – as judged by respondents looking at provided lists. Therefore it is impossible to directly compare the qualitative and the quantitative findings. The differences among the qualitative and quantitative findings also result from the respondents’ unfamiliarity with some concepts used in qualitative data collection, and the adaptation necessary to fit the qualitative findings onto the quantitative research instrument.

6.4 Directions for future research

Organizational project management methodologies are used widely in attempts to enhance project effectiveness and efficiency, and to improve the chances of project success. Future research into organizational project management methodologies is crucial in order to address several important questions which remain unanswered subsequent to this research.

First, this research did not investigate how efficient and effective organizational project management methodologies are in addressing the specific reasons why organizations use organizational project management methodologies. Future research is needed to better understand the extent to which organizational project management methodologies are able to address the reasons why organizations use such methodologies.

Second, this research did not investigate which combinations of organizational project management methodology structures and contents are most efficient and effective in addressing the specific reasons why organizations use organizational project methodologies. Future research is needed to better understand how and why organizations use organizational project management methodology structures and contents to address specific reasons why organizations use such methodologies.

Third, this research did not investigate exactly how organizations use organizational project management methodology structures and contents to address the reasons why organizations use organizational project management methodologies. Future research is needed to better understand use of organizational project management methodology structures and contents.

Finally, future research is needed to investigate the themes which emerged during this research, including

- how organizations balance standardization and flexibility in their attempts to enhance benefits from organizational project management methodologies
- how organizations use tailoring and adaptive applying to enhance organizational project management methodology fit with organizational and project contexts
- how organizations apply voluntary and mandatory policies regarding organizational project management methodology use
- why, how, and what kinds of “light” organizational project management methodologies are used
- how the point of inflection affects development, use, and maintenance of organizational project management methodologies.

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Invitation to participate in project management methodology research

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Abstract

Having been practiced in various forms for millennia, project management has become increasingly recognized since the 1950s through endeavors related to the Apollo space program, the Concorde aircraft, the English Channel tunnel and the Sydney Opera House. Many practical works and theoretical papers have been published in attempts to identify factors leading to project success, and issues to avoid in order to elude project failure. Meanwhile many organizations have been collecting project management processes, best practices, and lessons learned, and compiling them into structured collections known as project management methodologies. These collections have received surprisingly little academic attention: There are no papers focusing on them, and the few papers referencing them typically leave the concept undefined and unappreciated. This may be due to the concept being considered trivial, or the boundary which appears to exist between project management theory and practice. This is surprising, again, considering the rich empirical data project management methodologies offer for project management research. Project management methodology logics, structures, contents and their connections to organizational backgrounds, circumstances and targets appear especially interesting from the theoretical point of view. The research I am planning to perform is based on two beliefs that I have: Clues towards a pragmatic theory of project management can be identified, and the divide between the practical and theoretical fields of project management alleviated by examining organizational project management methodologies. Planning to perform a multiple case study, I am kindly inviting organizations to sign up for participation in my attempt to establish the first generally acceptable theory of project management.

1. Introduction

I am a 45 year old PhD student at the Department of Industrial Engineering and Management at Aalto University, School of Science and Technology, Espoo, Finland. Having started post-graduate studies in 2009 under the supervision of Professor Karlos Artto, I am now commencing the research for my PhD thesis. I have an interest in project management methodologies, and believe there is a connection between project management methodologies and a pragmatic theory of project management. This is important from the practical perspective, as an improved understanding of project management methodologies is likely to increase their ability to enhance project effectiveness and chances for project success, and from the theoretical perspective as I expect the rich empirical data to allow the first generally acceptable theory of project management to be established.



Having graduated from Aalto University (at the time known as Helsinki University of Technology) in 1992, I have served in a number of project management positions ranging from project engineer to projects director. I am a Certified Scrum Master, and PMP, IPMA Level C, IPMA Level B and PRINCE2 Foundation certified, and looking forward to upgrading my PRINCE2 certificate and acquiring the PgMP certificate. I chair the local IPMA Certification Body (operating IPMA certification in Finland), and head the Finnish Delegation to ISO/PC 236 and ISO/TC 258.

The aim of this paper is to invite organizations to sign up for the proposed research: This means allowing the analysis of organizational project management methodology in order to gain an understanding of the related logics, structures, contents, and their connections to organizational backgrounds, circumstances, and targets.

2. The Empirical Study

I am planning to implement the empirical part of research for my PhD thesis as a multiple case study following the framework defined by Kathleen Eisenhardt in her seminal paper *Building theories from case study research* as published in the October 1989 issue of *The Academy of Management Review*.

The initial research questions are:

RQ 1: Why do organizations create and employ project management methodologies?

RQ 2: How do organizations structure and populate project management methodologies?

I am looking for eight organizations to participate in the empirical study. Eight cases is considered optimum by multiple case study specialists, however, I am contacting a higher number understanding some organizations will decline this invitation, and some case selection will be necessary for improving the generalizability of the emerging theory. It is necessary for all organizations participating in the research to have a project management methodology, however, there is no need for this methodology to be extraordinary, or to be provided by a leading global supplier: Any project management methodology which provides appropriate service to the organization is well suited for the purposes of this research. It would be best from theory generalization point of view to have the participating organizations represent polar opposites on following axes: Private – Public; Finnish – non-Finnish; ICT – non-ICT:

	Private vs. Public		Finnish vs. non-Finnish		ICT vs. non-ICT	
Organization "A"	✓		✓		✓	
Organization "B"	✓		✓			✓
Organization "C"	✓			✓	✓	
Organization "D"	✓			✓		✓
Organization "E"		✓	✓		✓	
Organization "F"		✓	✓			✓
Organization "G"		✓		✓	✓	
Organization "H"		✓		✓		✓

Data collection, including one-to-one interviews with the people involved in project management methodology development, methodology management, and methodology use will be carried out with each participating organization. The aim of these interviews, which will be recorded and transcribed, is to collect information from the relevant people. Also, all available electronic and/or mechanic materials on methodology logics, structures, contents and their connections to organizational backgrounds, circumstances and targets will be collected and/or recorded. The empirical part of research will be organized in such a way that each participating organization only needs to invest the interviewees' time to participate in the research. All collected information will be considered and treated as strictly confidential. Applicable confidentiality agreements can be signed, as/if necessary, with all participating organizations. Research results will be published anonymously, and in such a way that it will be impossible to identify participating organizations and/or methodology details from the results.

All participating organizations will receive, in exchange for contributing, a summary of their project management methodology, and an analysis of their methodology according to the results of this research.

There is no exact time schedule for this research, however, my plan calls for the data collection to be implemented by the end of 2012. Relevant details will be agreed to as the list of participants emerges.

Hoping for as wide participation as possible, I kindly ask organizations wanting to sign up to participate and/or needing further information to email me at jouko.vaskimo@aalto.fi.

CASE STUDY PROTOCOL

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INTRODUCTION OF THE CASE STUDY AND THE PURPOSE OF PROTOCOL

- **A pragmatic theory of project management**
 - Why do organizations create and employ project management methodologies?
 - How do organizations structure and populate project management methodologies?
- Inductive theory building, exploratory study according to the *building theory from case study research* framework as defined by Eisenhardt in her 1989 paper *Building theory from case study research*
- This protocol defines a standard system to be followed in the empirical work in this research project

DATA COLLECTION PROCEDURES

- The following organizations have signed up for the research:

	Private vs. Public		Finnish vs. Non-Finnish		ICT vs. Non-ICT	
	A		A		A	
	B		B			B
	I		I			I
	J		J			J
	C			C	C	
	D			D		D
		E	E		E	
		F	F			F
		G		G	G	
		H		H		H

- Data collection will commence according to the Eisenhardt 1989 *Building theory from case study research* framework:

Step	Activity	Reason
Getting Started	Definition of research question Possibly a priori constructs	Focuses efforts Provides better grounding of construct measures
Selecting Cases	Neither theory nor hypotheses Specified population Theoretical, not random, sampling	Retains theoretical flexibility Constrains extraneous variation and sharpens external validity Focuses efforts on theoretically useful cases—i.e., those that replicate or extend theory by filling conceptual categories
Crafting Instruments and Protocols	Multiple data collection methods Qualitative and quantitative data combined Multiple investigators	Strengthens grounding of theory by triangulation of evidence Synergistic view of evidence Fosters divergent perspectives and strengthens grounding
Entering the Field	Overlap data collection and analysis, including field notes Flexible and opportunistic data collection methods	Speeds analyses and reveals helpful adjustments to data collection Allows investigators to take advantage of emergent themes and unique case features
Analyzing Data	Within-case analysis Cross-case pattern search using divergent techniques	Gains familiarity with data and preliminary theory generation Forces investigators to look beyond initial impressions and see evidence thru multiple lenses
Shaping Hypotheses	Iterative tabulation of evidence for each construct Replication, not sampling, logic across cases Search evidence for “why” behind relationships	Sharpens construct definition, validity, and measurability Confirms, extends, and sharpens theory Builds internal validity
Enfolding Literature	Comparison with conflicting literature Comparison with similar literature	Builds internal validity, raises theoretical level, and sharpens construct definitions Sharpens generalizability, improves construct definition, and raises theoretical level
Reaching Closure	Theoretical saturation when possible	Ends process when marginal improvement becomes small

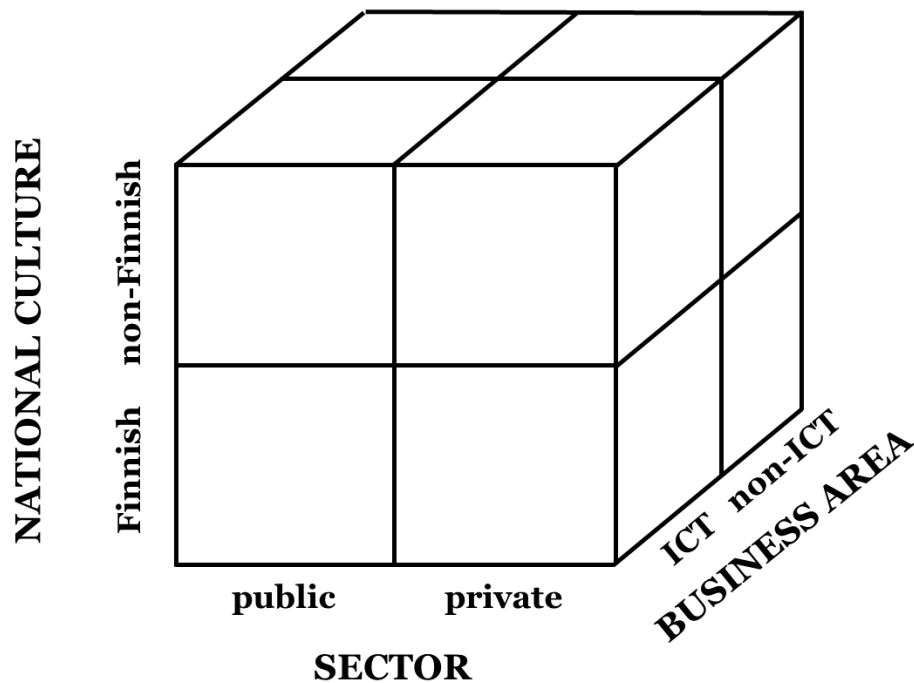
- Primary data collection:
 - **Interviews:** 2 methodology developers, 2 methodology users, and 2 managers in charge of methodology development and use will be interviewed.
 - **Documents:** Documents relevant to project management methodology logics, structures, contents, etc. will be collected and/or recorded during the visits.
- Secondary data collection:
 - **Questionnaire:** A questionnaire will be sent to all interview participants once all interviews have been completed.
- Issues and items to be taken care of before the interviews commence:
 - Dates
 - Times
 - Places
 - Names of interviewees
 - NDA issues as/if required
- A laptop computer and a microphone for recording interviews must be taken to the site.

OUTLINE OF THE CASE STUDY REPORT

- Introduction
- Literature review (theory & theorizing, theory of project management, contingency theory)
- Methodology
- Data analysis (within-case analysis & cross-case analysis)
- Conclusion and implications

PRIMARY CROSS-CASE ANALYSIS CATEGORIES:

1. **Sector:** Private (4) vs. Public (4) organizations
2. **National culture:** Finnish (4) vs. non-Finnish (4) organizations
3. **Business area:** ICT (4) vs. non-ICT (4) organizations



CASE STUDY QUESTIONS

RQ1: Why do organizations create and employ project management methodologies?

Level 1 questions (to be asked from individual interviewees):

- Describe **yourself** (name, age, how long with the current organization and in current role, how long involved with the organizational project management methodology)
- Describe **your organization and your role therein**
- Describe your **project management methodology** and its role in your organization
- **Why, how and when** did your organization employ project management methodology
- Describe **benefits your organization expects** from project management methodology
- Describe **benefits your organization receives** from project management methodology
- Describe **other motivational factors** your organization may have, or may have had for creating and employing the project management methodology

Level 2 questions (to be considered as per individual case):

- Why is this organization using this project management methodology?
- Why, how when and was it introduced/implemented?
- What are the expected benefits, what are the received benefits?
- Are there any other motivational factors for creating and employing the methodology?

RQ2: How do organizations structure and populate project management methodologies?

Level 1 questions (to be asked from individual interviewees):

- Describe methodology **structure** (projects? programs? portfolios? product? phase-gate?)
- Describe methodology **operating logic** (PMs / PMO choose how to use? modular?)
- Describe methodology **contents** (e.g. process description, templates, instructions)
- Describe methodology **framework** (e.g. graphical illustration)
- Describe methodology **connection** to organization backgrounds, circumstances & targets
- How well **does the methodology match the organizational needs**
- Describe the **organizational policy on applying** the methodology
- Describe the **organizational policy on developing** the methodology
- **Does the organization take any steps** to ensure methodology provides expected results
- Describe **order of importance** of methodology components, structures, operating logics
- Describe the **role of methodology framework** in optimizing methodology benefits

Level 2 questions (to be asked of the individual case):

- What is the structure, the operating logic and the contents of this methodology?
- What are the main components / sub-components of this methodology?
- What is the order of importance of methodology main / sub-components?
- How well does this methodology match the organizational needs?

Dear [respondent's name];

I would like to thank you sincerely for having recently participated in my PhD research relating to organizations creating, employing, structuring and populating organizational project management methodologies. Your contribution is highly appreciated and very valuable to my research, to project management research in general, and to the profession of project management.

It took me a while longer time to complete the interviews than I was originally expecting, however, I hope you are still willing to contribute some 15 minutes of your time to complete the one-page questionnaire on the next page. This questionnaire focuses on the interview results, and is designed to enhance the emerging understanding of project management methodologies. By combining the interview and questionnaire results I will also be able to provide an analysis of your project management methodology as promised in my original invitation to participate in this research.

As in the first part of my research, all collected information will be considered and treated as strictly confidential. All data will be processed anonymously so that it will be impossible to identify any organizations, participants or methodology details from the results.

I kindly ask you to complete the questionnaire by following these instructions:

1. Please complete the first (top) part of questionnaire by indicating how important each reason is for your organization, on a numeric rating scale from 1 to 10 (1 meaning "totally irrelevant" and 10 "extremely significant"; the 10-point numeric rating scale is explained at bottom of page). If an issue is not applicable / not employed at your organization, mark "0" in the scoring column. If you are unable to answer a question, leave the scoring column blank and mark "x" in the "cannot answer" column instead. Feel free to add items which you may feel are missing to the end of the list.
2. Please complete the second (middle) part of questionnaire by indicating how important each structure is for your organization by applying instructions given for the first (top) part (bullet # 1 above).
3. Please complete the third (bottom) part of questionnaire by indicating how important each content is for your organization, again applying instructions given for the first (top) part (bullet # 1 above).

Please return the completed questionnaire at your earliest convenience to jouko.vaskimo@aalto.fi.

Please do not hesitate to contact me in case you have questions and/or there is something unclear.

I value your participation highly, and look forward to being able to provide the research results to you and your organization once I have received and analyzed all completed questionnaires.

Thank you very much for your contribution;

Best regards;



totally irrelevant 1 2 3 4 5 6 7 8 9 10 extremely significant
(0 = not applicable / not employed in my organization)

How important are following reasons to use a project management methodology for your organization?

	0...10	cannot answer		0...10	cannot answer
1) It provides a common way of working			16) It enhances quality of project management		
2) It recycles best practices and lessons learned			17) It enhances quality of project deliverable		
3) It avoids "re-inventing the wheel"			18) It enhances keeping of customer promises		
4) It enhances reaching of agreed targets			19) It standardizes projects and provides consistency		
5) It provides structure to projects			20) It enhances project (planning) effectiveness		
6) It prevents chaos in projects			21) It enhances project (implementation) efficiency		
7) It shows reputation and assists sales & marketing			22) It provides common project language / vocabulary		
8) It enhances communications & information exchange			23) It optimizes use & management of project resources		
9) It enhances reporting & information sharing			24) It enhances chances of project success		
10) It enhances organizational project management			25) It enhances cost management		
11) It develops project staff project management skills			26) It enhances schedule management		
12) It enables quick "on-boarding" of new project staff			27) It eliminates project unpredictability & randomness		
13) It allows evaluating & comparing of project issues			Other (please specify):		
14) It enables exchanging and sharing of project staff			Other (please specify):		
15) It enhances risk management			Other (please specify):		

How important are following structures for your organizational project management methodology?

	0...10	cannot answer		0...10	cannot answer
1) Project management structure			16) Best practices & lessons learned recycling system		
2) Program management structure			17) Reporting, communications & information system		
3) Portfolio management structure			18) Experience & knowledge sharing system / events		
4) Product processes / connection to product processes			19) Project support (e.g. "master" & "apprentice") system		
5) Business processes / connection to business processes			20) Issue / risk / decision register system		
6) Phase – gate / stage – gate structure			21) Customer feedback / satisfaction / care system		
7) Modular methodology structure			22) Benefits tracking / management system		
8) Scalable methodology (e.g. "light" & "standard")			23) Risk management system		
9) Choice of project life cycles (e.g. "waterfall" & "agile")			24) Schedule / time management system		
10) Project (management) (complexity) evaluating system			25) Cost / budget management system		
11) Tailorable / applicable structures and contents			26) Quality management system		
12) Standard (PRINCE2, PMI) methodology approach			27) Stakeholder management system		
13) Methodology development & maintenance system			Other (please specify):		
14) Project staff training & on-boarding system			Other (please specify):		
15) Methodology use / project auditing system			Other (please specify):		

How important are following contents for your organizational project management methodology?

	0...10	cannot answer		0...10	cannot answer
1) Document templates			16) Health, safety and environmental materials		
2) Process descriptions and guidelines			17) Expected phase inputs and outputs		
3) Process diagrams			18) Contracting / billing / invoicing materials & instr.		
4) Methodology framework ("big picture")			19) Decision-making materials and instructions		
5) Training materials and instructions			20) Change management materials and instructions		
6) Role definitions and descriptions			21) Sales and marketing materials and instructions		
7) Project minimum / compliance requirements			22) Resource planning materials and instructions		
8) Project (management) calculation sheets			23) Risk management materials and instructions		
9) Project (management) checklists			24) Schedule / time management materials and instructions		
10) Project (management) dashboards			25) Cost / budget management materials and instructions		
11) Project management / methodology handbook / manual			26) Quality management materials and instructions		
12) Project management / methodology quick guide			27) Financing materials and instructions		
13) Methodology tailoring / applying instructions			Other (please specify):		
14) Project management tools (or links thereto)			Other (please specify):		
15) Information on stakeholders and customers			Other (please specify):		

totally irrelevant 1 2 3 4 5 6 7 8 9 10 extremely significant

(0 = not applicable / not employed in my organization)

How important are organizational project management methodology structures for groups of organizations?

Private vs. public organizations

This quantitative cross-case analysis shows how important organizational project management methodology structures are for private and public case organizations. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D1, and illustrated in Figure D1.

Table D1: Summary of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{priv} and M_{publ} . Bold typeface indicates the structures with greatest and smallest differences in between the focal groups; red and blue colors identify private and public data as illustrated in Figure D1.

Organizational project management methodology structures	n_{priv}	M_{priv}	SD_{priv}	n_{publ}	M_{publ}	SD_{publ}	ΔM	M_{all}
methodology development & maintenance system	25	8,08	1,06	21	6,90	1,72	1,18	7,54
project (management) (complexity) evaluating system	24	7,25	1,56	22	6,14	2,60	1,11	6,72
methodology use / project auditing system	28	7,96	0,94	22	6,86	1,77	1,10	7,48
best practices & lessons learned recycling system	28	8,14	1,22	24	7,21	1,58	0,93	7,71
standard (PRINCE2 / PMI) methodology approach	28	7,61	1,45	20	6,70	2,30	0,91	7,23
issue / risk / decision register system	27	7,89	1,59	24	7,00	1,35	0,89	7,47
schedule / time management system	28	8,64	1,39	25	7,84	1,32	0,80	8,26
cost / budget management system	28	8,64	1,37	25	7,92	1,44	0,72	8,30
tailorable / applicable structures & contents	27	7,85	1,71	21	7,14	1,88	0,71	7,54
experience & knowledge sharing system / events	28	7,75	1,90	24	7,04	1,46	0,71	7,42
stakeholder management system	27	7,70	1,51	20	7,00	1,18	0,70	7,40
customer feedback / satisfaction / care system	27	7,52	2,38	23	6,83	1,71	0,69	7,20
scalable methodology (e.g. "light" & "standard")	25	8,16	1,64	23	7,48	2,12	0,68	7,83
product processes / connection to product processes	23	6,65	2,37	20	6,00	2,07	0,65	6,35
modular methodology structure	24	7,13	1,96	17	6,53	2,15	0,60	6,88
reporting, communications & information system	28	8,29	1,19	25	7,72	1,76	0,57	8,02
benefits tracking / management system	22	6,68	2,58	22	6,14	1,82	0,55	6,41
risk management system	28	8,32	1,51	25	7,80	1,52	0,52	8,08
project staff training & on-boarding system	26	8,19	1,00	24	7,79	1,47	0,40	8,00
quality management system	27	7,93	1,94	24	7,63	1,38	0,30	7,78
program management structure	25	6,92	2,45	22	6,82	2,48	0,10	6,87
portfolio management structure	24	7,17	2,43	20	7,10	2,07	0,07	7,14
choice of project life cycles (e.g. "waterfall" & "agile")	25	6,68	2,34	17	6,71	1,77	-0,03	6,69
phase - gate / stage - gate structure	25	7,60	2,42	19	7,63	1,49	-0,03	7,61
project support (e.g. "master" & "apprentice") system	24	7,08	2,06	22	7,14	1,36	-0,05	7,11
business processes / connection to business processes	26	7,58	2,34	22	7,64	1,80	-0,06	7,60
project management structure	28	8,86	1,25	25	8,96	1,04	-0,10	7,54

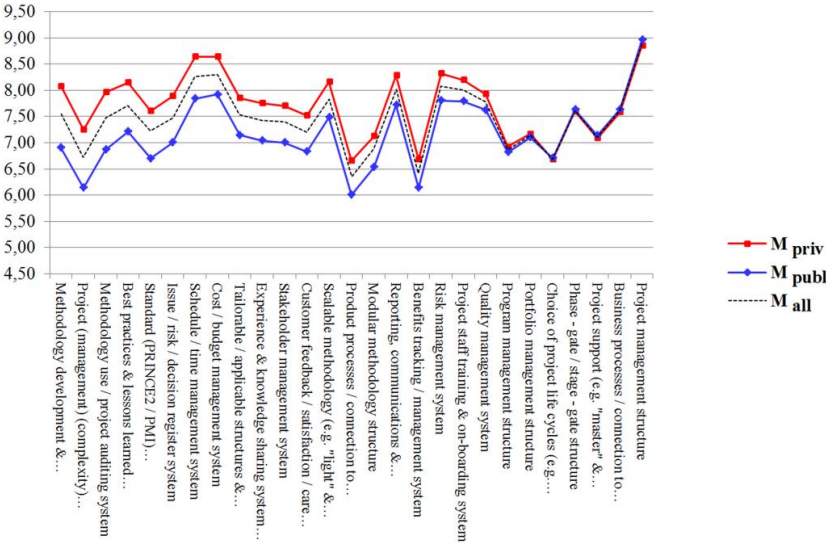


Figure D1: Illustration of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{priv} and M_{publ} .

From the quantitative data similarities and differences between the private and the public case organizations can be identified:

The private and the public case organizations consider structures such as program management structure, portfolio management structure, choice of project life cycles (e.g. "waterfall" & "agile"), phase - gate / stage - gate structure, project support (e.g. "master" & "apprentice") system similarly important.

The private case organizations consider structures such as methodology development & maintenance system, project (management) (complexity) evaluating system, methodology use / project auditing system, best practices & lessons learned recycling system, and standard (PRINCE2 / PMI) methodology approach more important than the public ones.

The public case organizations consider structures such as business processes / connection to business processes and project management structure more important than the private ones.

Finnish vs. other organizations

This quantitative cross-case analysis shows how important organizational project management methodology structures are for Finnish and other case organizations, which are referred here to as “non-Finnish”. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D2, and illustrated in Figure D2.

Table D2: Summary of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} . Bold typeface indicates the structures with greatest and smallest differences in between the focal groups; red and blue colors identify Finnish and non-Finnish data as illustrated in Figure D2

Organizational project management methodology structures	n_{Fin}	M_{Fin}	SD_{Fin}	n_{nFin}	M_{nFin}	SD_{nFin}	ΔM	M_{all}
customer feedback / satisfaction / care system	30	8,17	1,46	20	5,75	2,14	2,42	7,20
program management structure	26	7,81	1,44	21	5,71	2,93	2,09	6,87
portfolio management structure	25	8,00	1,50	19	6,00	2,60	2,00	7,14
project (management) (complexity) evaluating system	27	7,26	1,67	19	5,95	2,58	1,31	6,72
business processes / connection to business processes	26	8,15	1,51	22	6,95	2,50	1,20	7,60
project support (e.g. "master" & "apprentice") system	28	7,57	1,42	18	6,39	1,98	1,18	7,11
phase - gate / stage - gate structure	27	8,04	1,43	17	6,94	2,67	1,10	7,61
experience & knowledge sharing system / events	30	7,87	1,52	22	6,82	1,85	1,05	7,42
quality management system	29	8,21	0,96	22	7,23	2,23	0,98	7,78
modular methodology structure	23	7,26	1,29	18	6,39	2,67	0,87	6,88
benefits tracking / management system	24	6,71	1,84	20	6,05	2,62	0,66	6,41
product processes / connection to product processes	21	6,67	1,52	22	6,05	2,75	0,62	6,35
stakeholder management system	25	7,68	1,19	22	7,09	1,59	0,59	7,40
cost / budget management system	30	8,50	1,18	23	8,04	1,71	0,46	8,30
project management structure	30	9,10	0,79	23	8,65	1,46	0,45	8,91
best practices & lessons learned recycling system	29	7,90	1,47	23	7,48	1,44	0,42	7,71
scalable methodology (e.g. "light" & "standard")	27	8,00	1,66	21	7,62	2,19	0,38	7,83
risk management system	30	8,23	1,41	23	7,87	1,68	0,36	8,08
reporting, communications & information system	30	8,13	1,48	23	7,87	1,54	0,26	8,02
schedule / time management system	30	8,33	1,25	23	8,17	1,61	0,16	8,26
project staff training & on-boarding system	27	8,04	1,26	23	7,96	1,27	0,08	8,00
issue / risk / decision register system	28	7,50	1,24	23	7,43	1,86	0,07	7,47
methodology use / project auditing system	29	7,41	1,03	21	7,57	1,92	-0,16	7,48
tailorable / applicable structures & contents	27	7,44	1,73	21	7,67	1,94	-0,22	7,54
methodology development & maintenance system	26	7,35	1,62	20	7,80	1,33	-0,45	7,54
standard (PRINCE2 / PMI) methodology approach	26	6,92	1,80	22	7,59	1,97	-0,67	7,23
choice of project life cycles (e.g. "waterfall" & "agile")	24	6,29	2,15	18	7,22	1,99	-0,93	6,69

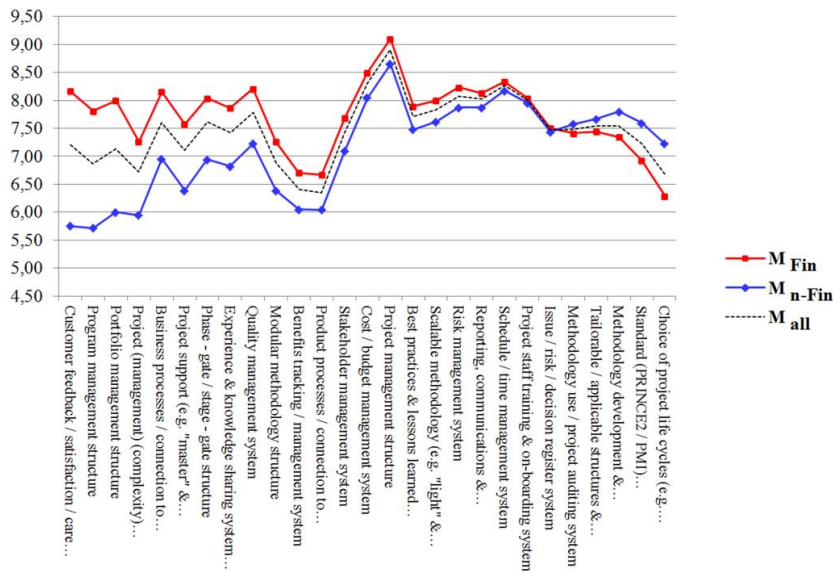


Figure D2: Illustration of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} .

From the quantitative data similarities and differences between the Finnish and the non-Finnish case organizations can be identified:

The Finnish and the non-Finnish case organizations consider structures such as schedule / time management system, project staff training & on-boarding system, issue / risk / decision register system, methodology use / project auditing system, and tailorable / applicable structures & contents similarly important.

The Finnish case organizations consider structures such as customer feedback / satisfaction / care system, program management structure, portfolio management structure, project (management) (complexity) evaluating system, and business processes / connection to business processes more important than the non-Finnish ones.

The non-Finnish case organizations consider structures such as methodology development & maintenance system, standard (PRINCE2 / PMI) methodology approach, and choice of project life cycles (e.g. "waterfall" & "agile") more important than the Finnish ones.

ICT vs. other organizations

This quantitative cross-case analysis shows how important organizational project management methodology structures are for ICT and other case organizations, which are referred here to as “non-ICT”. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D3, and illustrated in Figure D3.

Table D3: Summary of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{ICT} and M_{nICT} . Bold typeface indicates the structures with greatest and smallest differences in between the focal groups; red and blue colors identify ICT and non-ICT data as illustrated in Figure D3.

Organizational project management methodology structures	n_{ICT}	M_{ICT}	SD_{ICT}	n_{nICT}	M_{nICT}	SD_{nICT}	ΔM	M_{all}
choice of project life cycles (e.g. "waterfall" & "agile")	22	7,00	2,30	20	6,35	1,88	0,65	6,69
methodology development & maintenance system	22	7,68	1,14	24	7,42	1,78	0,27	7,54
product processes / connection to product processes	20	6,45	2,40	23	6,26	2,13	0,19	6,35
methodology use / project auditing system	22	7,55	1,27	28	7,43	1,61	0,12	7,48
project management structure	24	8,96	1,34	29	8,86	0,97	0,10	8,91
scalable methodology (e.g. "light" & "standard")	24	7,88	1,81	24	7,79	2,02	0,08	7,83
project staff training & on-boarding system	23	8,04	1,00	27	7,96	1,45	0,08	8,00
tailorable / applicable structures & contents	23	7,57	1,35	25	7,52	2,17	0,05	7,54
portfolio management structure	19	6,95	2,63	25	7,28	1,95	-0,33	7,14
reporting, communications & information system	24	7,83	1,37	29	8,17	1,60	-0,34	8,02
standard (PRINCE2 / PMI) methodology approach	23	7,00	2,02	25	7,44	1,77	-0,44	7,23
program management structure	20	6,60	2,91	27	7,07	2,05	-0,47	6,87
modular methodology structure	21	6,57	2,04	20	7,20	2,04	-0,63	6,88
experience & knowledge sharing system / events	23	7,04	1,81	29	7,72	1,64	-0,68	7,42
business processes / connection to business processes	21	7,19	2,44	27	7,93	1,74	-0,74	7,60
schedule / time management system	24	7,83	1,62	29	8,62	1,10	-0,79	8,26
phase - gate / stage - gate structure	21	7,19	2,52	23	8,00	1,44	-0,81	7,61
stakeholder management system	21	6,95	1,36	26	7,77	1,37	-0,82	7,40
best practices & lessons learned recycling system	24	7,21	1,61	28	8,14	1,19	-0,93	7,71
issue / risk / decision register system	24	6,96	1,57	27	7,93	1,39	-0,97	7,47
risk management system	24	7,50	1,85	29	8,55	1,00	-1,05	8,08
cost / budget management system	24	7,67	1,62	29	8,83	1,02	-1,16	8,30
project (management) (complexity) evaluating system	20	6,05	2,33	26	7,23	1,93	-1,18	6,72
project support (e.g. "master" & "apprentice") system	19	6,32	1,92	27	7,67	1,39	-1,35	7,11
quality management system	22	7,00	1,88	29	8,38	1,27	-1,38	7,78
customer feedback / satisfaction / care system	22	6,18	2,29	28	8,00	1,58	-1,82	7,20
benefits tracking / management system	20	5,40	2,37	24	7,25	1,74	-1,85	6,41

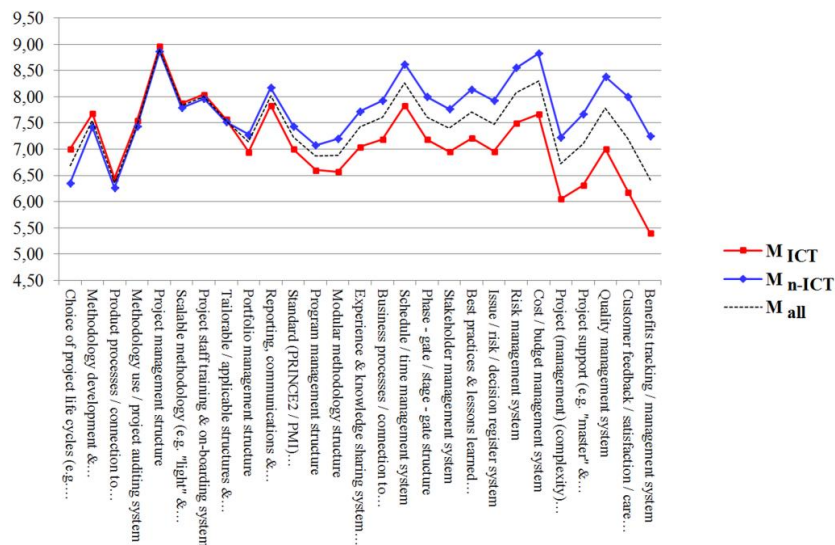


Figure D3: Illustration of responses to question “How important are following structures for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{ICT} and M_{n-ICT} .

From the quantitative data similarities and differences between the ICT and the non-ICT case organizations can be identified:

The ICT and the non-ICT case organizations consider structures such as methodology use / project auditing system, project management structure, scalable methodology (e.g. "light" & "standard"), project staff training & on-boarding system, and tailorable / applicable structures and contents similarly important.

The ICT case organizations consider structures such as choice of project life cycles (e.g. "waterfall" & "agile"), methodology development & maintenance system, and product processes / connection to product processes more important than the non-ICT ones.

The non-ICT case organizations consider structures such as project (management) (complexity) evaluating system, project support (e.g. "master" & "apprentice") system, quality management system, customer feedback / satisfaction / care system, and benefits tracking / management system more important than the ICT ones.

How important are organizational project management methodology contents for groups of organizations?

Private vs. public organizations

This quantitative cross-case analysis shows how important organizational project management methodology contents are for private and public case organizations. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D4, and illustrated in Figure D4.

Table D4: Summary of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{priv} and M_{publ} . Bold typeface indicates the contents with greatest and smallest differences in between the focal groups; red and blue colors identify private and public data as illustrated in Figure D4.

Organizational project management methodology contents	n_{priv}	M_{priv}	SD_{priv}	n_{publ}	M_{publ}	SD_{publ}	ΔM	M_{all}
sales and marketing materials and instructions	22	6,45	2,66	20	4,80	2,46	1,65	5,67
change management materials and instructions	27	8,11	1,71	24	6,58	1,89	1,53	7,39
project management tools (or links thereto)	28	8,32	1,75	25	7,04	2,01	1,28	7,72
project (management) dashboards	26	7,73	2,30	22	6,45	1,75	1,28	7,15
information on stakeholders and customers	27	7,15	2,24	24	6,00	2,40	1,15	6,61
cost / budget management materials and instructions	27	8,26	1,40	25	7,20	1,88	1,06	7,75
methodology tailoring / applying instructions	28	7,96	1,38	22	6,91	1,35	1,06	7,50
schedule / time management materials and instructions	27	8,30	1,38	25	7,40	1,65	0,90	7,87
project management / methodology handbook / manual	26	7,38	1,92	22	6,59	1,97	0,79	7,02
document templates	28	8,86	1,06	25	8,08	2,02	0,78	8,49
expected phase inputs and outputs	26	7,77	1,76	23	7,00	1,22	0,77	7,41
decision-making materials and instructions	26	7,27	1,63	21	6,52	1,79	0,75	6,94
resource planning materials and instructions	27	7,22	1,66	24	6,50	1,96	0,72	6,88
risk management materials and instructions	28	8,11	1,35	25	7,40	1,52	0,71	7,77
health, safety and environmental materials	24	6,58	2,52	20	5,90	2,30	0,68	6,27
financing materials and instructions	23	7,48	1,53	22	6,86	2,26	0,61	7,18
project minimum / compliance requirements	26	8,15	1,38	22	7,59	1,15	0,56	7,90
training materials and instructions	28	7,96	1,88	25	7,44	1,77	0,52	7,72
methodology framework ("big picture")	27	7,74	1,84	25	7,32	1,83	0,42	7,54
contracting / billing / invoicing materials & instructions	27	7,59	2,11	21	7,19	2,30	0,40	7,42
project (management) calculation sheets	24	7,25	2,31	22	6,95	1,64	0,30	7,11
project (management) checklists	27	7,70	1,88	24	7,50	1,44	0,20	7,61
quality management materials and instructions	27	7,48	1,62	25	7,36	1,44	0,12	7,42
process descriptions and guidelines	28	8,46	1,18	25	8,36	1,49	0,10	8,42
project management / methodology quick guide	26	7,38	2,06	22	7,41	2,12	-0,02	7,40
role definitions and descriptions	28	8,04	1,55	25	8,12	1,37	-0,08	8,08
process diagrams	28	7,00	2,09	25	7,32	1,62	-0,32	7,15

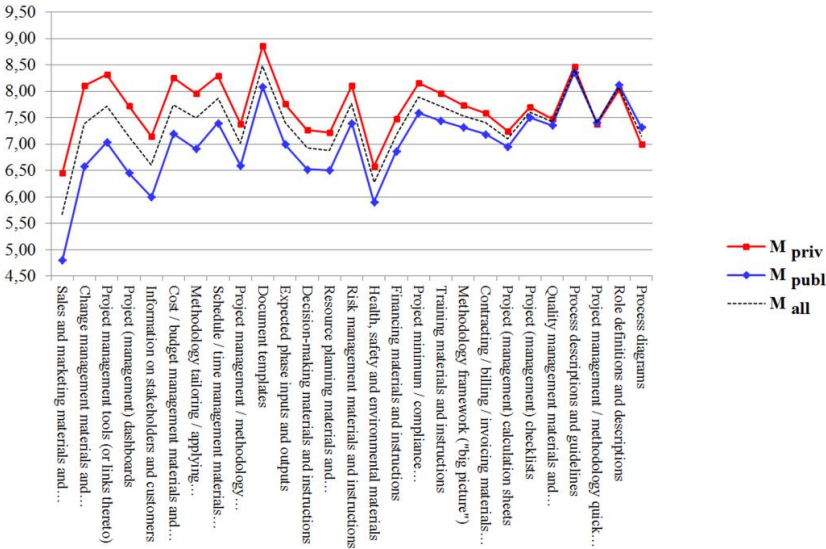


Figure D4: Illustration of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{priv} and M_{publ} .

From the quantitative data similarities and differences between the private and public case organizations can be identified:

The private and the public case organizations consider contents such as project (management) checklists, quality management materials and instructions, process descriptions and guidelines, project management / methodology quick guide, and role definitions and descriptions similarly important.

The private case organizations consider contents such as sales and marketing materials and instructions, change management materials and instructions, project management tools (or links thereto), project (management) dashboards, and information on stakeholders and customers more important than the public organizations.

The public case organizations consider contents such as process diagrams more important than the private organizations.

Finnish vs. other organizations

This quantitative cross-case analysis shows how important organizational project management methodology contents are for Finnish and other case organizations, which are referred here to as “non-Finnish”. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D5, and illustrated in Figure D5.

Table D5: Summary of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} . Bold typeface indicates the contents with greatest and smallest differences in between the focal groups; red and blue colors identify Finnish and non-Finnish data as illustrated in Figure D5.

Organizational project management methodology contents	n_{Fin}	M_{Fin}	SD_{Fin}	n_{nFin}	M_{nFin}	SD_{nFin}	ΔM	M_{all}
sales and marketing materials and instructions	26	6,77	2,22	16	3,88	2,42	2,89	5,67
health, safety and environmental materials	28	7,14	2,01	16	4,75	2,38	2,39	6,27
project management tools (or links thereto)	30	8,43	1,17	23	6,78	2,39	1,65	7,72
information on stakeholders and customers	28	7,29	2,19	23	5,78	2,36	1,50	6,61
resource planning materials and instructions	29	7,34	1,51	22	6,27	2,05	1,07	6,88
project (management) calculation sheets	25	7,56	1,53	21	6,57	2,38	0,99	7,11
contracting / billing / invoicing materials & instructions	28	7,82	2,07	20	6,85	2,26	0,97	7,42
quality management materials and instructions	30	7,83	1,07	22	6,86	1,87	0,97	7,42
document templates	30	8,90	0,98	23	7,96	2,10	0,94	8,49
change management materials and instructions	28	7,79	1,45	23	6,91	2,34	0,87	7,39
project (management) checklists	29	7,97	1,16	22	7,14	2,12	0,83	7,61
risk management materials and instructions	30	8,10	1,22	23	7,35	1,66	0,75	7,77
decision-making materials and instructions	26	7,27	1,48	21	6,52	1,94	0,75	6,94
training materials and instructions	30	8,03	1,58	23	7,30	2,07	0,73	7,72
project management / methodology handbook / manual	26	7,35	1,36	22	6,64	2,48	0,71	7,02
cost / budget management materials and instructions	30	8,00	1,79	22	7,41	1,59	0,59	7,75
financing materials and instructions	26	7,42	2,12	19	6,84	1,63	0,58	7,18
schedule / time management materials and instructions	30	8,10	1,54	22	7,55	1,59	0,55	7,87
project management / methodology quick guide	27	7,63	1,89	21	7,10	2,29	0,53	7,40
project (management) dashboards	26	7,35	1,94	22	6,91	2,37	0,44	7,15
methodology framework ("big picture")	29	7,72	1,60	23	7,30	2,09	0,42	7,54
process descriptions and guidelines	30	8,57	1,20	23	8,22	1,47	0,35	8,42
process diagrams	30	7,30	1,62	23	6,96	2,18	0,34	7,15
project minimum / compliance requirements	26	8,04	1,19	22	7,73	1,42	0,31	7,90
role definitions and descriptions	30	8,20	1,19	23	7,91	1,74	0,29	8,08
expected phase inputs and outputs	26	7,50	1,37	23	7,30	1,78	0,20	7,41
methodology tailoring / applying instructions	29	7,24	1,43	21	7,86	1,42	-0,62	7,50

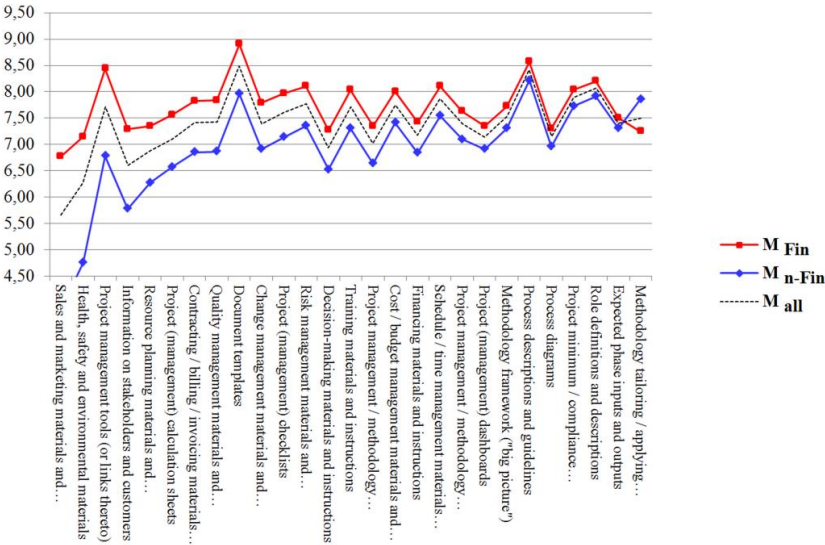


Figure D5: Illustration of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} .

From the quantitative data similarities and differences between the Finnish and the non-Finnish case organizations can be identified:

The Finnish and the non-Finnish case organizations consider contents such as process descriptions and guidelines, process diagrams, project minimum / compliance requirements, role definitions and descriptions, and expected phase inputs and outputs similarly important.

The Finnish case organizations consider contents such as sales and marketing materials and instructions, health, safety and environmental materials, project management tools (or links thereto), information on stakeholders and customers, and resource planning materials and instructions more important than the non-Finnish ones.

The non-Finnish case organizations consider contents such as methodology tailoring / applying instructions more important than the Finnish ones.

ICT vs. other organizations

This quantitative cross-case analysis shows how important organizational project management methodology contents are for ICT and other case organizations, which are referred here to as “non-ICT”. The analysis is based on quantitative data on a 1-to-10 scale collected by surveying 53 respondents, summarized in Table D6, and illustrated in Figure D6.

Table D6: Summary of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{ICT} and M_{nICT} . Bold typeface indicates the contents with greatest and smallest differences in between the focal groups; red and blue colors identify the ICT and non-ICT data as illustrated in Figure D6.

Organizational project management methodology contents	n_{ICT}	M_{ICT}	SD_{ICT}	n_{nICT}	M_{nICT}	SD_{nICT}	ΔM	M_{all}
process descriptions and guidelines	24	8,58	1,11	29	8,28	1,48	0,31	8,42
methodology tailoring / applying instructions	23	7,57	1,41	27	7,44	1,50	0,12	7,50
document templates	24	8,46	1,76	29	8,52	1,52	-0,06	8,49
project minimum / compliance requirements	22	7,77	1,41	26	8,00	1,21	-0,23	7,90
process diagrams	24	7,00	2,06	29	7,28	1,72	-0,28	7,15
expected phase inputs and outputs	24	7,21	1,80	25	7,60	1,30	-0,39	7,41
change management materials and instructions	24	7,17	2,19	27	7,59	1,68	-0,43	7,39
methodology framework ("big picture")	23	7,26	1,94	29	7,76	1,74	-0,50	7,54
role definitions and descriptions	24	7,79	1,58	29	8,31	1,32	-0,52	8,08
resource planning materials and instructions	22	6,45	2,27	29	7,21	1,35	-0,75	6,88
quality management materials and instructions	23	7,00	1,82	29	7,76	1,16	-0,76	7,42
decision-making materials and instructions	21	6,48	2,01	26	7,31	1,38	-0,83	6,94
training materials and instructions	24	7,25	1,76	29	8,10	1,83	-0,85	7,72
risk management materials and instructions	24	7,29	1,67	29	8,17	1,15	-0,88	7,77
project management tools (or links thereto)	24	7,21	2,14	29	8,14	1,74	-0,93	7,72
project management / methodology handbook / manual	24	6,50	1,96	24	7,54	1,87	-1,04	7,02
schedule / time management materials and instructions	23	7,26	1,72	29	8,34	1,27	-1,08	7,87
cost / budget management materials and instructions	23	7,13	2,03	29	8,24	1,25	-1,11	7,75
financing materials and instructions	19	6,53	2,26	26	7,65	1,52	-1,13	7,18
project (management) checklists	23	6,96	1,97	28	8,14	1,19	-1,19	7,61
project (management) dashboards	24	6,50	2,25	24	7,79	1,85	-1,29	7,15
project management / methodology quick guide	22	6,68	2,01	26	8,00	1,96	-1,32	7,40
sales and marketing materials and instructions	16	4,81	3,32	26	6,19	2,06	-1,38	5,67
project (management) calculation sheets	21	6,19	2,26	25	7,88	1,39	-1,69	7,11
contracting/billing/invoicing materials & instructions	19	6,21	2,78	29	8,21	1,19	-2,00	7,42
information on stakeholders and customers	23	5,43	2,62	28	7,57	1,64	-2,14	6,61
health, safety and environmental materials	17	4,53	2,28	27	7,37	1,83	-2,84	6,27

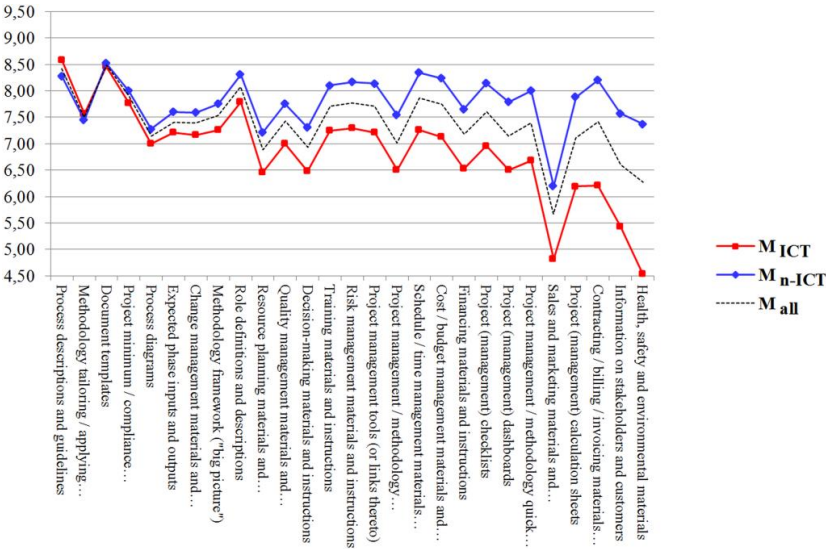


Figure D6: Illustration of responses to question “How important are following contents for your organizational project management methodology?” in a decreasing order of ΔM , the difference between M_{ict} and M_{n-ict} .

From the quantitative data similarities and differences between the ICT and the non-ICT case organizations can be identified:

The ICT and the non-ICT case organizations consider contents such as methodology tailoring / applying instructions, document templates, project minimum / compliance requirements, process diagrams, and expected phase inputs and outputs similarly important.

The ICT case organizations consider contents such as process descriptions and guidelines more important than the non-ICT ones.

The non-ICT case organizations consider contents such as sales and marketing materials and instructions, project (management) calculation sheets, contracting / billing / invoicing materials & instructions, information on stakeholders and customers, and health, safety and environmental materials more important than the ICT ones.

How important are reasons to use an organizational project management methodology for groups of organizations?

Private vs. public organizations

This quantitative cross-case analysis shows how important reasons to use an organizational project management methodology are for private and public case organizations. The analysis is based on quantitative data on a 1-to-10 scale collected from 53 respondents, summarized in Table D7, and illustrated in Figure D7.

Table D7: Summary of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM , the difference between M_{priv} and M_{publ} . Bold typeface indicates the reasons with greatest and smallest differences in between the focal groups; red and blue colors identify private and public data as illustrated in Figure D7.

Reasons to use organizational project management methodologies	n_{priv}	M_{priv}	SD_{priv}	n_{publ}	M_{publ}	SD_{publ}	ΔM	M_{all}
it shows reputation and assists sales & marketing	25	6,92	2,02	20	4,85	2,57	2,07	6,00
it enables quick "on-boarding" of new project staff	28	8,07	1,65	25	6,60	1,90	1,47	7,38
it enables exchanging and sharing of project staff	27	6,93	1,94	24	6,08	2,10	0,84	6,53
it avoids "re-inventing the wheel"	28	8,43	1,05	25	7,60	1,39	0,83	8,04
it recycles best practices and lessons learned	28	7,82	1,42	25	7,12	1,31	0,70	7,49
it enhances reporting & information sharing	28	7,89	1,42	25	7,36	1,29	0,53	7,64
it enhances keeping of customer promises	28	7,32	1,85	25	6,88	1,70	0,44	7,11
it provides common project language / vocabulary	27	8,44	1,29	25	8,04	1,31	0,40	8,25
it prevents chaos in projects	28	7,43	1,82	25	7,08	1,81	0,35	7,26
it allows evaluating & comparing of project issues	28	6,71	2,22	25	6,48	1,55	0,23	6,60
it enhances reaching of agreed targets	28	7,79	1,70	25	7,56	1,27	0,23	7,68
it standardizes projects and provides consistency	28	8,39	1,11	25	8,24	1,14	0,15	8,32
it enhances cost management	28	7,39	1,63	25	7,28	1,89	0,11	7,34
it enhances quality of project deliverable	28	7,46	1,50	25	7,36	1,23	0,10	7,42
it enhances communications & information exchange	28	7,25	1,81	25	7,24	1,27	0,01	7,25
it provides structure to projects	28	8,32	1,14	25	8,32	1,41	0,00	8,32
it develops project staff project management skills	27	7,52	1,52	25	7,60	1,33	-0,08	7,56
it enhances chances of project success	28	7,75	1,24	25	7,84	1,05	-0,09	7,79
it provides a common way of working	28	8,79	1,05	25	8,96	1,11	-0,17	8,87
it enhances risk management	28	7,82	1,69	25	8,08	1,29	-0,26	7,94
it enhances project (implementation) efficiency	28	7,25	1,81	25	7,56	1,47	-0,31	7,40
it enhances schedule management	28	7,54	1,66	25	7,88	1,24	-0,34	7,70
it eliminates project unpredictability & randomness	28	6,89	1,97	25	7,28	1,56	-0,39	7,08
it enhances organizational project management	27	7,78	1,64	25	8,28	1,22	-0,50	8,02
it enhances quality of project management	28	7,89	1,52	25	8,48	0,98	-0,59	8,17
it enhances project (planning) effectiveness	28	7,43	1,74	25	8,08	1,47	-0,65	7,74
it optimizes use & management of project resources	27	6,30	1,88	24	7,04	1,74	-0,75	6,65

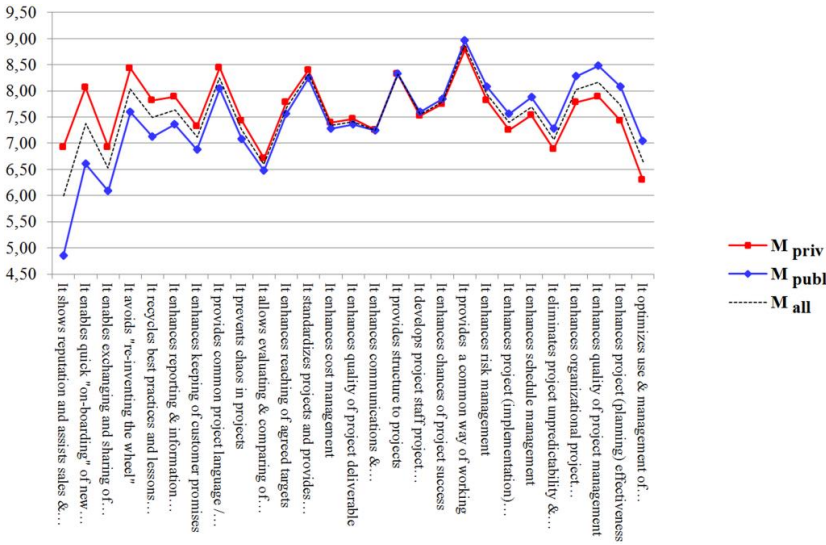


Figure D7: Illustration of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM, the difference between M_{priv} and M_{publ}.

From the quantitative data similarities and differences between the private and public case organizations can be identified:

The private and the public case organizations consider reasons such as it enhances quality of project deliverable, it enhances communications & information exchange, it provides structure to projects, it develops project staff project management skills, and it enhances chances of project success similarly important.

The private case organizations consider reasons such as it shows reputation and assists sales & marketing, it enables quick "on-boarding" of new project staff, it enables exchanging and sharing of project staff, it avoids "re-inventing the wheel", and it recycles best practices and lessons learned more important than the public ones.

The public case organizations consider reasons such as it eliminates project unpredictability & randomness, it enhances organizational project management, it enhances quality of project management, it enhances project (planning) effectiveness, and it optimizes use & management of project resources more important than the private ones.

Finnish vs. other organizations

This quantitative cross-case analysis shows how important reasons to use an organizational project management methodology are for Finnish and other case organizations, which are referred here to as “non-Finnish”. The analysis is based on quantitative data on a 1-to-10 scale collected from 53 respondents, summarized in Table D8, and illustrated in Figure D8.

Table D8: Summary of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} . Bold typeface indicates the reasons with greatest and smallest differences in between the focal groups; red and blue colors identify Finnish and non-Finnish data as illustrated in Figure D8.

Reasons to use organizational project management methodologies	n_{Fin}	M_{Fin}	SD_{Fin}	n_{nFin}	M_{nFin}	SD_{nFin}	ΔM	M_{all}
it allows evaluating & comparing of project issues	30	7,23	1,58	23	5,78	2,04	1,45	6,60
it enhances keeping of customer promises	30	7,63	1,74	23	6,43	1,64	1,20	7,11
it enhances quality of project management	30	8,67	0,87	23	7,52	1,53	1,14	8,17
it shows reputation and assists sales & marketing	27	6,41	2,11	18	5,39	2,89	1,02	6,00
it enhances reaching of agreed targets	30	8,10	1,22	23	7,13	1,68	0,97	7,68
it enhances schedule management	30	8,03	1,33	23	7,26	1,57	0,77	7,70
it enhances project (planning) effectiveness	30	8,07	1,31	23	7,30	1,92	0,76	7,74
it enables exchanging and sharing of project staff	30	6,83	2,02	21	6,10	2,04	0,74	6,53
it enhances quality of project deliverable	30	7,70	1,00	23	7,04	1,68	0,66	7,42
it enhances project (implementation) efficiency	30	7,63	1,30	23	7,09	2,00	0,55	7,40
it eliminates project unpredictability & randomness	30	7,30	1,75	23	6,78	1,82	0,52	7,08
it enhances risk management	30	8,17	1,53	23	7,65	1,46	0,51	7,94
it develops project staff project management skills	30	7,77	0,88	22	7,27	1,91	0,49	7,56
it enhances cost management	30	7,50	1,93	23	7,13	1,48	0,37	7,34
it standardizes projects and provides consistency	30	8,47	0,99	23	8,13	1,26	0,34	8,32
it recycles best practices and lessons learned	30	7,63	1,17	23	7,30	1,65	0,33	7,49
it enhances organizational project management	30	8,13	1,48	22	7,86	1,46	0,27	8,02
it provides structure to projects	30	8,43	1,02	23	8,17	1,52	0,26	8,32
it enables quick "on-boarding" of new project staff	30	7,47	1,78	23	7,26	2,07	0,21	7,38
it prevents chaos in projects	30	7,33	1,74	23	7,17	1,93	0,16	7,26
it avoids "re-inventing the wheel"	30	8,10	1,25	23	7,96	1,33	0,14	8,04
it enhances reporting & information sharing	30	7,70	0,94	23	7,57	1,81	0,13	7,64
it enhances chances of project success	30	7,83	1,07	23	7,74	1,26	0,09	7,79
it provides a common way of working	30	8,87	0,99	23	8,87	1,19	0,00	8,87
it provides common project language / vocabulary	29	8,24	1,13	23	8,26	1,51	-0,02	8,25
it optimizes use & management of project resources	29	6,59	1,73	22	6,73	2,00	-0,14	6,65
it enhances communications & information exchange	30	6,97	1,43	23	7,61	1,69	-0,64	7,25

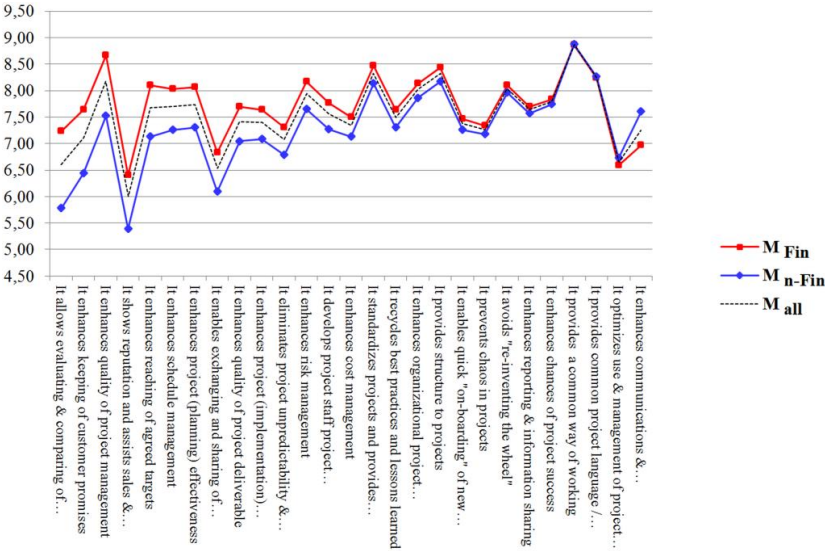


Figure D8: Illustration of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM , the difference between M_{Fin} and M_{nFin} .

From the quantitative data similarities and differences between the Finnish and the non-Finnish case organizations can be identified:

The Finnish and the non-Finnish case organizations consider reasons such as it avoids "re-inventing the wheel", it enhances reporting & information sharing, it enhances chances of project success, it provides a common way of working, and it provides common project language / vocabulary similarly important.

The Finnish case organizations consider reasons such as it allows evaluating & comparing of project issues, it enhances keeping of customer promises, it enhances quality of project management, it shows reputation and assists sales & marketing, and it enhances reaching of agreed targets more important than the non-Finnish organizations.

The non-Finnish case organizations consider reasons such as it optimizes use & management of project resources and it enhances communications & information exchange more important than the Finnish ones.

ICT vs. other organizations

This quantitative cross-case analysis shows how important reasons to use an organizational project management methodology are for ICT and other case organizations, which are referred here to as “non-ICT”. The analysis is based on quantitative data on a 1-to-10 scale collected from 53 respondents, summarized in Table D9, and illustrated in Figure D9.

Table D9: Summary of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM , the difference between M_{ICT} and M_{nICT} . Bold typeface indicates the reasons with greatest and smallest differences in between the focal groups; red and blue colors identify ICT and non-ICT data as illustrated in Figure D9.

Reasons to use organizational project management methodologies	n_{ICT}	M_{ICT}	SD_{ICT}	n_{nICT}	M_{nICT}	SD_{nICT}	ΔM	M_{all}
it provides a common way of working	24	9,25	0,88	29	8,55	1,13	0,70	8,87
it enhances organizational project management	23	8,17	1,17	29	7,90	1,67	0,28	8,02
it provides common project language / vocabulary	24	8,38	1,22	28	8,14	1,38	0,23	8,25
it enhances communications & information exchange	24	7,29	1,43	29	7,21	1,69	0,08	7,25
it avoids "re-inventing the wheel"	24	8,04	1,27	29	8,03	1,30	0,01	8,04
it enables quick "on-boarding" of new project staff	24	7,38	1,93	29	7,38	1,90	0,00	7,38
it enables exchanging and sharing of project staff	23	6,43	2,18	28	6,61	1,95	-0,17	6,53
it provides structure to projects	24	8,21	1,35	29	8,41	1,19	-0,21	8,32
it standardizes projects and provides consistency	24	8,17	0,99	29	8,45	1,22	-0,28	8,32
it eliminates project unpredictability & randomness	24	6,92	2,14	29	7,21	1,45	-0,29	7,08
it enhances reporting & information sharing	24	7,46	1,12	29	7,79	1,56	-0,33	7,64
it recycles best practices and lessons learned	24	7,29	1,59	29	7,66	1,21	-0,36	7,49
it enhances quality of project deliverable	24	7,21	1,53	29	7,59	1,22	-0,38	7,42
it prevents chaos in projects	24	7,00	1,85	29	7,48	1,77	-0,48	7,26
it enhances quality of project management	24	7,88	1,36	29	8,41	1,25	-0,54	8,17
it enhances chances of project success	24	7,46	1,12	29	8,07	1,11	-0,61	7,79
it enhances project (implementation) efficiency	24	7,04	1,81	29	7,69	1,46	-0,65	7,40
it enhances project (planning) effectiveness	24	7,38	1,68	29	8,03	1,56	-0,66	7,74
it develops project staff project management skills	24	7,13	1,39	28	7,93	1,36	-0,80	7,56
it enhances risk management	24	7,46	1,50	29	8,34	1,42	-0,89	7,94
it enhances schedule management	24	7,21	1,47	29	8,10	1,37	-0,90	7,70
it enhances reaching of agreed targets	24	7,17	1,67	29	8,10	1,21	-0,94	7,68
it enhances keeping of customer promises	24	6,54	1,96	29	7,59	1,50	-1,04	7,11
it optimizes use & management of project resources	22	6,05	1,94	29	7,10	1,65	-1,06	6,65
it enhances cost management	24	6,63	1,80	29	7,93	1,48	-1,31	7,34
it allows evaluating & comparing of project issues	24	5,88	1,94	29	7,21	1,71	-1,33	6,60
it shows reputation and assists sales & marketing	17	4,65	2,72	28	6,82	1,95	-2,17	6,00

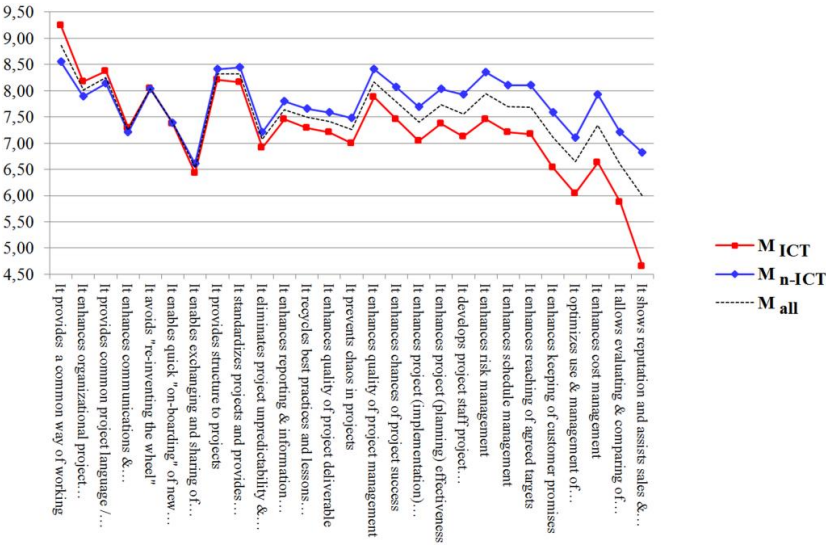


Figure D9: Illustration of responses to question “How important are following reasons to use a project management methodology for your organization?” in a decreasing order of ΔM , the difference between M_{ICT} and M_{n-ICT} .

From the quantitative data similarities and differences between the ICT and non-ICT case organizations can be identified:

The ICT and the non-ICT case organizations consider reasons such as it enhances communications & information exchange, it avoids "re-inventing the wheel", it enables quick "on-boarding" of new project staff, it enables exchanging and sharing of project staff, and it provides structure to projects similarly important.

The ICT case organizations consider reasons such as it provides a common way of working, it enhances organizational project management, and it provides common project language / vocabulary more important than the non-ICT ones.

The non-ICT case organizations consider reasons such as it enhances keeping of customer promises, it optimizes use & management of project resources, it enhances cost management, it allows evaluating & comparing of project issues, and it shows reputation and assists sales & marketing more important than the ICT ones.

Structures, contents, and reasons to use project management methodologies used in quantitative data collection

Structures

Project management structure: A project management methodology high-level system for organizing structures related to project management

Program management structure: A project management methodology high-level system for organizing structures related to program management

Portfolio management structure: A project management methodology system for organizing structures related to portfolio management

Product processes / connection to product processes: Structures coordinating and organizing the processes related to producing the project deliverable

Business processes / connection to business processes: Structures coordinating and organizing the processes related to running the project business

Phase – gate / stage – gate structure: Structure coordinating and organizing a sequence of project phases and decision-making gates

Modular methodology structure: Structure establishing a modular system of using and re-using methodology structures and contents

Scalable methodology (e.g. “light” & “standard”): Structure allowing methodology requirements to be scaled down for projects with limited complexity and complicatedness

Choice of project life cycles (e.g. “waterfall” & “agile”): Structure allowing the most suitable project life cycle to be selected for each project

Project (management) (complexity) evaluating system: Structure allowing evaluation of project complexity and complicatedness

Tailorable / applicable structures and contents: Structure expecting organizations to tailor methodologies according to organizational needs, and project management staff to adaptively apply methodologies according to project needs

Standard (PRINCE2, PMI) methodology approach: Structure adopted from a public-domain or a commercial project management standard

Methodology development & maintenance system: Structure coordinating and organizing methodology development and maintenance

Project staff training & on-boarding system: Structure coordinating and organizing the training and introducing of project management staff in to a new project environment

Methodology use / project auditing system: Structure coordinating and organizing how and to what extent a methodology is used, and how the projects being management with the methodology are progressing

Best practices & lessons learned recycling system: Structure coordinating and organizing the collection and dissemination *best practices* and *lessons learned*

Reporting, communications & information system: Structure coordinating and organizing reporting, communications, and informatics

Experience & knowledge sharing system / events: Structure coordinating, organizing and enhancing collection and dissemination of experience and knowledge

Project support (e.g. “master” & “apprentice”) system: Structure coordinating and organizing on-the-job knowledge and experience transfer from senior to junior project management staff

Issue / risk / decision register system: Structure coordinating and organizing the managing of issues, risks, and decisions

Customer feedback / satisfaction / care system: Structure coordinating and organizing customer feedback, satisfaction, and care

Benefits tracking / management system: Structure coordinating and organizing benefits tracking and benefits management

Risk management system: Structure coordinating and organizing risk management

Schedule / time management system: Structure coordinating and organizing schedule and time management

Cost / budget management system: Structure coordinating and organizing cost and budget management

Quality management system: Structure coordinating and organizing quality management

Stakeholder management system: Structure coordinating and organizing stakeholder management

Other (please specify): Respondents were encouraged to suggest structures not included in the provided list

Contents

Document templates: Contents assisting project management staff in delivering project documents

Process descriptions and guidelines: Contents assisting project management staff in understanding and performing of project activities

Process diagrams: Graphical contents assisting project management staff in understanding and performing of project activities

Methodology framework (“big picture”): Graphical content assisting project management staff in understanding project phases and project management subject areas, and in performing project management activities

Training materials and instructions: Contents assisting project management staff in enhancing project management knowledge

Role definitions and descriptions: Contents assisting project management staff in understanding project management roles and responsibilities

Project minimum / compliance requirements: Contents assisting project management staff in understanding required project activities

Project (management) calculation sheets: Contents assisting project management staff understand and perform project calculations

Project (management) checklists: Contents assisting project management staff understand and check required activities

Project (management) dashboards: Contents assisting project management staff understand status of one or many projects

Project management / methodology handbook / manual: Contents assisting project management staff perform project management and understand the project management methodology

Project management / methodology quick guide: Abridged contents assisting project management staff perform project management and understand the project management methodology

Methodology tailoring / applying instructions: Contents assisting project management methodology development staff in tailoring the methodology, and project management staff in adaptively applying the methodology

Project management tools (or links thereto): Contents assisting project management staff perform project management activities

Information on stakeholders and customers: Contents assisting project management staff in identifying and understanding project stakeholders and customers

Health, safety and environmental materials: Contents assisting project management staff in understanding and performing project HSE activities

Expected phase inputs and outputs: Contents assisting project management staff in understanding expected project phase inputs and outputs

Contracting / billing / invoicing materials & instructions: Contents assisting project management staff in understanding and performing of project contracting, billing, and invoicing

Decision-making materials and instructions: Contents assisting project management staff in understand and making decisions

Change management materials and instructions: Contents assisting project management staff in understanding and performing change management

Sales and marketing materials and instructions: Contents assisting project management staff in understanding and performing project sales and marketing

Resource planning materials and instructions: Contents assisting project management staff in understanding and performing project resource management

Risk management materials and instructions: Contents assisting project management staff in understanding and performing project risk management

Schedule / time management materials and instructions: Contents assisting project management staff in understanding and performing project schedule and time management

Cost / budget management materials and instructions: Contents assisting project management staff in understanding and performing project cost and budget management

Quality management materials and instructions: Contents assisting project management staff in understanding and performing project quality management

Financing materials and instructions: Contents assisting project management staff in understanding and performing project financing

Other (please specify): Respondents were encouraged to suggest contents not included in the provided list

Reasons to use project management methodologies

It provides a common way of working: Organizational project management methodology enables a common way of working

It recycles best practices and lessons learned: Organizational project management methodology enables transfer of knowledge and experience

It avoids “re-inventing the wheel”: Organizational project management methodology enables accumulation of knowledge and experience

It enhances reaching of agreed targets: Organizational project management methodology enables project management staff reach agreed targets

It provides structure to projects: Organizational project management methodology enables enhanced project organization and project structures

It prevents chaos in projects: Organizational project management methodology enhances project control

It shows reputation and assists sales & marketing: Organizational project management methodology demonstrates organizational capability to deliver projects

It enhances communications & information exchange: Organizational project management methodology enhance communication and information exchange

It enhances reporting & information sharing: Organizational project management methodology enhance reporting, information collection, and information dissemination

It enhances organizational project management: Organizational project management methodology enhances organizational project management in general

It develops project staff project management skills: Organizational project management methodology enhances project management staff project management skills

It enables quick “on-boarding” of new project staff: Organizational project management methodology enhances the training and introducing of new project management staff into a new project environment

It allows evaluating & comparing of project issues: Organizational project management methodology enhances project and project management commensurability

It enables exchanging and sharing of project staff: Organizational project management methodology enables exchanging and sharing of project management staff

It enhances risk management: Organizational project management methodology enhances project risk management

It enhances quality of project management: Organizational project management methodology enhances quality of project management

It enhances quality of project deliverable: Organizational project management methodology enhances quality of project deliverable

It enhances keeping of customer promises: Organizational project management methodology enhances focusing on and keeping customer promises

It standardizes projects and provides consistency: Organizational project management methodology standardizes projects and provides consistency

It enhances project (planning) effectiveness: Organizational project management methodology enhances project planning and effectiveness

It enhances project (implementation) efficiency: Organizational project management methodology enhances project implementation and efficiency

It provides common project language / vocabulary: Organizational project management methodology provide sa common project language and a common project vocabulary

It optimizes use & management of project resources: Organizational project management methodology enhances use and management of project resources

It enhances chances of project success: Organizational project management methodology enhances chances of project success

It enhances cost management: Organizational project management methodology enhances project cost management

It enhances schedule management: Organizational project management methodology enhances project schedule management

It eliminates project unpredictability & randomness: Organizational project management methodology eliminates project unpredictability and randomness, and enhances project predictability and certainty

Other (please specify): Respondents were encouraged to suggest reasons not included in the provided list

Organizations use organizational project management methodologies - structured collections of project management knowledge and experience - to enhance project effectiveness and efficiency, and to improve the chances of project success. Regardless of their widespread use, research into organizational project management methodologies is scarce.

This thesis describes a mixed-method multiple case study among ten project-based organizations: Qualitative data are collected from 57, and quantitative data from 53 respondents.

The findings show key structures and contents organizations use in organizational project management methodologies, and the specific reasons why organizations use such methodologies.



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