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Information Systems Success

An empirical study on the appropriate
success criteria and the real value of critical
success factors

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Abstract

Success is a complex concept, that people have been trying to understand for some time. Extensive research has been conducted in order to improve our understanding, and thus increase our chances for achieving success. However, as projects still continue to fail, the real value of this research seems unclear. This thesis emphasizes the distinction between variables that may *cause* success (success factors), and variables that are *part of* success (success criteria). Success is not a 'black and white' concept, in that different viewpoints may produce different evaluations, due to different underlying criteria. Hence, the same IT project may be considered successful from one viewpoint, while a failure from another. In addition, the context affecting IT projects will differ from project to project, both within and between organizations. This thesis suggests that this context can not be limited to a certain set of dimensions. The difference in context produces differences to the appropriate definition of success between projects. Hence, no general ultimate list of success criteria for all projects seems to exist. This thesis therefore makes an effort to investigate whether dynamic selections of success criteria are applicable, through two qualitative case studies. However, both of the dynamic selections investigated came up short in the cases studied. Hence, the appropriate success criteria seems to remain a matter of definition, that needs to be concluded and agreed upon by each respective project team.

Some research has attempted to reduce success down to lists of what they refer to as *critical success factors*. However, as context will differ from project to project, no ultimate list of success factors seem to exist. The lists of critical success factors are in addition unfortunately sometimes presented with an indication of a guaranteed success. One would therefore be tempted to believe that it is relatively easy to achieve success. However, this study demonstrates that the possible value of a mere list of factors seems limited, by investigating how user involvement, one of the most heavily discussed and recognized success factors, is dealt with by project teams in practice. The thesis concludes that the challenges related to user involvement goes beyond the question of whether to involve users or not, and correspondingly that listing user involvement as a critical success factor in itself has little value.

Sammendrag

Suksess er et sammensatt begrep som man har forsøkt å forstå over lengre tid. Omfattende forskning har forsøkt å utbedre vår forståelse av suksess, og dermed øke sjansene våre for å kunne lykkes. Ettersom prosjekter imidlertid likevel fortsetter å mislykkes, er den reelle verdien av denne forskningen uklart. Denne avhandlingen understreker skillet mellom variabler som kan *forårsake* suksess (suksessfaktorer), og variabler som er *del av* suksess (suksesskriterier). Suksess er ikke ”svart og hvitt” konsept. Ulike synspunkter kan gi ulike evalueringer, på bakgrunn av ulike underliggende kriterier. IT prosjekter kan derfor betraktes som en suksess fra en side, samtidig som det betraktes som en total fiasko fra en annen. I tillegg vil konteksten som påvirker IT-prosjekter variere fra prosjekt til prosjekt, både intern og eksternt mellom organisasjoner. Denne forskjellen forårsaker forskjeller i hva som regnes som en passende definisjon av suksess. Denne kontekstforskjellen kan ikke begrenses til et bestemt sett av dimensjoner. Derfor kan man tilsynelatende konkludere at en generell og statisk liste over suksesskriterier for alle prosjekter ikke kan eksistere. Denne avhandlingen gjør derfor et forsøk, gjennom to kvalitative case-studier, på å undersøke om dynamiske utvalg av suksesskriterier kan være aktuelt. Begge de dynamiske utvalgene som ble undersøkt kom imidlertid til kort som grunnlag for valg av suksesskriterier. Utvalget av passende suksesskriterier ser dermed ut til å forbli et definisjonsspørsmål, som må avklares av hver respektive prosjektgruppe.

Noe forskning har også forsøkt å redusere suksess ned til lister over hva de refererer til som *kritiske suksessfaktorer*. Men ettersom kontekst vil variere fra prosjekt til prosjekt, er det tilsynelatende sikkert å anslå at det heller ikke eksisterer noen generell liste over suksessfaktorer. Listene over kritiske suksessfaktorer blir i tillegg dessverre noen ganger presentert med en indikasjon på en garantert suksess. Man skulle derfor være fristet til å tro at det er relativt enkelt å oppnå suksess. Denne studien viser imidlertid at den faktiske verdien av en ren liste over faktorer virker veldig begrenset. Ved å undersøke hvordan brukerinvolvering, en av de mest tungt diskutert og anerkjent suksessfaktorene, behandles av prosjektgrupper i praksis, konkluderer denne avhandlingen med at utfordringene knyttet til brukerinvolvering går lengre enn spørsmålet om brukere skal involveres eller ikke, og at brukerinvolvering kun som en kritisk suksessfaktor i seg selv har liten verdi.

Preface

This master's thesis is submitted to the Norwegian University of Science and Technology (NTNU) as the final part of the five-year Masters degree in Computer Science, at the Department of Computer and Information Science.

I would like to thank my supervisor Eric Monteiro for valuable comments and guidance throughout this work. I would also like to thank all participating organizations and all the interviewees who took the time to participate in the case studies. Their contributions have been invaluable to this thesis.

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1

Introduction

1.1 Motivation

Gartner Worldwide IT Spending Forecast predicts an enormous total global annual spending of more than \$3.5 Trillion US Dollars this year [1], and it is quite safe to claim that a significant amount of these investments are not successful. Information Technology (IT)¹ and Information Systems (IS) projects frequently fail, at least according to several sources [2, 3]. Project failures have been the topic of numerous articles and studies over the last decades, and still seem to be widely discussed. The Standish Group² has published a series of reports named *the CHAOS manifesto*, which focuses on IT project success and failure rates including indicators for the different outcomes. Their original report was published in 1995 [4], and shockingly reported that "Overall, the success rate was only 16.2%, while challenged projects accounted for 52.7%, and impaired (canceled) for 31.1%." [4]. Even though their study was conducted over 15 years ago, and only involved projects in the United States, it provided a strong indication that success in IT projects might be challenging in general. The CHAOS manifesto will be discussed further in subsequent chapters of this thesis.

Information Systems are now part of almost everything we do, and in some situations, tasks simply can not be completed in their absence. In Norway, we have become so dependent on such systems that we simply cannot function without them. Dagens it³ specifically wrote an article last year stating that "Norway stops without Altinn⁴" [5], and this is not out of the ordinary. Dagbladet.no wrote an article no more than a few months ago considering how the evolution of IT has created a patchwork of systems in Norwegian organizations, almost too complex to handle [6]. This evolution has over time

¹Information Technology is the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware - ITAA99

²The Standish Group describes themselves as "a group of highly dedicated professionals with years of practical experience in assessing risk, cost, return and value for Information Technology (IT) Investments" - www.standishgroup.com

³Dagens it is an online biweekly newspaper covering the IT business sector - <http://www.dagensit.no/>

⁴Altinn is a portal for electronic dialogue between businesses and the public authorities in Norway - <http://www.altinn.no/>

made IT projects become the interest of everyone, and not only IT professionals.

Furthermore, IT projects may have high investment costs, even when they are canceled prior to completion, and failures may therefore have serious economic consequences. If we are to believe the media, numerous Norwegian companies have come to experience this the hard way. Aftenposten.no wrote an article last summer about an IT project in Statoil⁵ that had accumulated costs of about half a billion NOK before being abandoned [7]. In 2009, Dagens it wrote about another Norwegian project sharing a similar faith; The project was also abandoned before completion, due to missing delivery, with total expected costs of 417 million NOK [8]. These numbers are for most of us too large to grasp, but they serve as a valid indication that IT project success is critical. IT projects are in fact so important that the *Norwegian Agency for Public Management and eGovernment* (Difi) has established a recommended project model for the implementation of digital change projects, to support public agencies.

More recent reports have shown improved success rates [9], however there is unfortunately little doubt that projects still fail to succeed.

1.2 Research Problem

The question of why projects fail, is in fact ambiguous. The actual question, is why projects fail to satisfy what we consider to be success? Hence, the answer to the original question in fact has two parts; What do we consider to be a success, and why do projects fail to comply with this definition? However, before exploring these aspects of success in depth, it seems essential to clarify some related terms that have been used interchangeably and inconsistently in the literature.

1.2.1 Success Factors and Success Criteria

When discussing success, it is important to separate variables that may *cause* success from variables that are *being part of* success. Some have explained these variables as independent and dependent respectively [10], but success factors and success criteria (Lim and Mohamed (1999) [11]) not only seems more appropriate, but also more intuitive. Even though Lim and Mohamed considered engineering and construction projects, these terms apply for projects in general. Lim and Mohamed pointed to the definition of the two terms in The Concise English Dictionary⁶, in which a criterion was defined as "a principle or standard by which anything is or can be judged", whereas a factor "any circumstance, fact or influence which contribute to a result". Intuitively this may be applied to projects in that factors *contribute* towards the outcome of a project, while criteria *identify* the outcome of the project. An example of a factor could be user involvement, while an example of a criterion could be user satisfaction. One might notice that some (e.g. user satisfaction) may both *contribute* towards success and *identify* success, and may thus be

⁵Statoil is a Norwegian oil and gas company - <http://www.statoil.com/>

⁶Hayword, A. L. and Sparkes, J. J., The Concise English Dictionary. New Orchard, 1990

considered both a factor and a criterion. However, it is important to acknowledge that, even though they seem similar, they are distinct.

Success factors and criteria are related in that factors may contribute towards the achievement of the criteria; user involvement may contribute towards user satisfaction. As such, both categories might be considered equally important. Failure to fulfill a success criterion implies failure to achieve success, while failure to fulfill a success factor may have been one of the reasons why we did not fulfill the criterion in the first place. However, it is important to emphasize that there is no absolute relationship between factors and criteria; a success factor does not necessarily guarantee the achievement of a success criterion. Both factors and criteria will be discussed throughout this thesis, but the relationship between them has not been the focus of the study *per se*.

1.2.2 Research Question

The answers to the different parts of the original question of why projects fail, is clearly related to the distinction between criteria and factors.

- What do we consider to be success? (Success criteria)
- What contributes towards such success or failure? (Success factors)

The first part is all about gaining an understanding of how and why some projects are perceived as successes, rather than failures, both explicitly and implicitly, in both research and in practice. The second part on the other hand, considers the study of factors that contribute towards such success or failure.

It is important to demonstrate the motivation for understanding what defines success. Would it not be adequate, and if so, more effective to focus directly on the second part; Understanding what contribute towards such success (i.e. how to achieve it)? First of all, "The measurement of information systems (IS) success or effectiveness is critical to our understanding of the value and efficacy of IS management actions and IS investments." [12]. However, measuring success may often be associated with the purpose of directing blame in cases where things go wrong. It is therefore important to emphasize that the real value of success criteria is not necessarily related to the measurement of the outcome in the aftermath. On the contrary, the real value may be based on the idea that having an understanding of what a project is meant to achieve in itself, may contribute significantly to project management success (i.e. it may be considered a success factor) [13]. Recognizing this, one might also acknowledge that, agreeing on success criteria before project start, and at several points during the project's life cycle should be considered good project management practice [14]. Additionally, without a proper understanding of what constitutes success, we will not know which criteria to satisfy in order to achieve the success we are seeking. Only when the success criteria have been defined, one can consider the appropriate factors to deliver those criteria [15]. One might therefore say that the second question provides no actual value without an answer to the first. Altogether, both knowledge of the appropriate success criteria and the factors to achieve

this success represents critical pieces in the puzzle that makes up our understanding of success.

By understanding what defines success and how to increase the chances of achieving it, project teams should apparently improve their ability to execute projects effectively. At the same time, customers should be given the opportunity to understand their responsibilities with respect to providing optimal underlying conditions for the project team. Hence, an extensive amount of research has been performed in both of these areas, and we now have numerous suggestions on the appropriate success criteria, as well as several lists claiming to reveal the factors that are critical to such success [4].

However, despite this large number of studies, projects undoubtedly still fail to succeed. This indicates that success might not be that straightforward, and that the actual value of all this research is yet to be proved. We apparently seem to know why projects fail, and how to prevent their failure - so why do they still fail?⁷

This thesis takes the approach of a more complex reality than what seemed to be assumed by previous research. It is suggested that the context affecting IT projects is a composite structure that can not be limited to a finite set of dimensions, and hence that an ultimate and finite set of success criteria for all projects, does not exist. Correspondingly, as success factors are highly dependent on the appropriate success criteria (Ref: Sec. 1.2.1), a general list of factors can not be found. With that being said, little research seems to investigate dynamic selections of the appropriate success criteria, and this study will therefore first attempt to determine whether such selections are applicable.

The lists of success factors presented in the CHAOS reports are primarily based on quantitative surveys of IT executive managers [4], and in general this idea that success may be reduced down to a general list of factors, corresponds to a quantitative mindset. However, the notion that no ultimate list of factors or criteria can be found, indicates the need for a qualitatively oriented thinking in order to ever be able to complete our understanding. Hence, a qualitative approach has been taken in this thesis in an attempt to provide some answers to the questions asked.

Based on a literature review and the findings of two case studies, this thesis discusses whether project objectives and stakeholder satisfaction may be applied as context sensitive and dynamic selections of the appropriate success criteria. In addition, this thesis attempts to further investigate the real value of success factors by understanding how *user involvement*, one of the most heavily discussed and recognized critical success factors, is dealt with by project teams in practice.

⁷Also known as *Cobb's Paradox*: Martin Cobb, Treasury Board of Canada Secretariat

1.3 Report Structure

This thesis is organized into six chapters. This first chapter gives an introduction to the research problem and the motivation behind this thesis. The second chapter attempts to combine the findings of existing literature and provide an overview of the difficulties of finding the appropriate success criteria. Subsequently, the second chapter provides an introduction to the current literature on user involvement, including briefly the impact of agile methodologies. Based on this theoretical platform, the third chapter describes the design and implementation of the two case studies; a public transport ticketing project in a Norwegian county, and three parallel projects in a modernization program in a Norwegian agency responsible for housing politics. The third chapter also evaluates potential weaknesses following this choice of method. The fourth chapter then presents the findings of each of these case studies, while the fifth chapter discusses these findings in the light of the theoretical overview provided in chapter three. The last chapter concludes on this discussion and suggests potential areas of further research.

1.4 Limitations

The findings of this study can not be used as basis for any generalization. They provide indications for the value of critical success factors and the challenges of defining the appropriate criteria. However, they are exclusively based on the interpretations of two case studies, and may therefore not be representative for projects in general. In addition, the findings and discussion are based on subjective interpretations of observations, and can not be considered facts. My background as a student, and my missing practical experience, have without doubt affected and put limitations to the analysis, and in so the results of the study.

2

Theoretical Background

The purpose of this chapter is to serve as an overview of the current available literature on IT project success. The chapter is divided with respect to the research problem identified in Section 1.2. The first part considers our different understandings and hence difficulties of agreeing on success criteria, while the last part attempts to cover some of the literature on one specific success factor, *user involvement*.

2.1 Success Criteria - Our Understanding of Success

Thomas and Fernández (2008) provide empirical evidence supporting the idea that companies who formally define and effectively measure success have more overall confidence in the benefits of their IT projects [16]. Furthermore, their findings indicate that simply defining and measuring project success, regardless of how effective the actual measurements are, may positively impact project outcomes. In this context, they consider the effectiveness of measurements to be their capability to produce positive outcomes from their evaluation practices [16]. In addition, Wateridge (1997) observed a greater agreement on success criteria between project managers and end users on successful projects [15]. Unless success criteria is agreed upon, stakeholders will find themselves traveling in different directions until ultimately and inevitably one or more of them will perceive the project to be a failure [15]. Hence, if there can be greater convergence of the criteria by all parties in the project, the chance of success will increase [15]. These results suggest that formally defining and measuring the success of projects should be considered good project management practice [14]. But how do we define and measure success? Numerous studies consider evaluation for research purposes, but the literature in general seems to lack really valuable reflections and advises on evaluation in practice [17]. Thus, through this section, an effort has been made to provide actual value in practice. It is important to emphasize that the number of general studies on project success is extensive, but IS/IT projects are quite different from other projects [15], hence an attempt has been made to focus explicitly on literature specifically targeting such projects.

Success or failure?

The studies claiming high failure ratios on information system projects have all evaluated

the selected projects after some criteria, but what exactly is considered a project failure, and what is considered a success? Do we have projects that fall in between? Some projects may fail to meet the expected deadlines, budget costs and features or functionality, while others may be finished on time, but the resulting systems never used. Partly due to the large number of various project outcomes there are so far no one common criterion, and there probably never will be. "It is unlikely that any single overarching measure of I/S success will emerge; and so multiple measures will be necessary, at least in the foreseeable future" [10].

Category	Description
Project Success	The project is completed on-time and on-budget, with all features and functions as initially specified.
Project Challenged	The project is completed and operational but over-budget, over the time estimate, and offers fewer features and functions than originally specified.
Project Failed	The project is canceled at some point during the development cycle.

Table 2.1: The Standish Group Report Project Categories

The Standish Group's original report divided projects into three distinct categories as shown in Table 2.1. This grouping is a good foundation for discussing project outcome, as it acknowledges that some projects may not be considered either success or failure. Success in IT projects is not necessarily a 'black and white' concept, and systems may not always be seen as completely successful or complete failures [15]. However, Standish' classification ignores, or at least it does not show, that projects may not easily fit into one distinct category due to subjective evaluations originating from different perspectives given by various evaluator viewpoints [18]. Hamilton and Chervany (1981) described at least three valid viewpoints to all information systems (users, developers and management), and additionally the evaluations within each of these viewpoints tend to deviate due to subjective perceptions of system objectives, and experiences with system performance in accomplishing organizational goals [18]. As everyone will have different expectations to a project, their criteria for project success will differ [11]. Thus, success and failure are difficult to define and measure, as they mean different things to different people [16]. It has been stated that such challenges with defining success cause a lot of projects to be initiated without a clear understanding of success [19]. As such, we need a way to provide us with an understanding of success that incorporates the appropriate criteria. However, as the research on success measures is far more exhaustive, and as success measures and criteria are quite tightly connected, the first part of this section has been devoted to success measures.

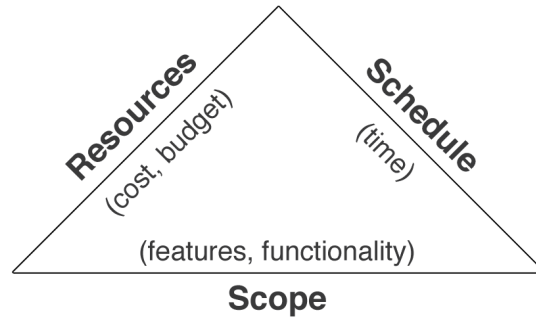


Figure 2.1: The Iron Triangle [20]

2.1.1 Information System Success Measures

In the search of a framework for success measures, one realizes quickly that there are a large number of different ways to measure and evaluate the success of an outcome, and the same goes for Information Systems. The Standish Group’s original report based their evaluation on what is known as “the iron triangle”, which has been known as the common assessment of information systems and information technology success [15], and seems to have been used widely both in research and practice. The iron triangle (cost, time and functionality) is shown in Figure 2.1. Later, this triangle has also been known as the *project management triangle*¹. However, this is far from the only measure(s).

As DeLone & McLean (1992) [10] points out, almost every study on information systems success seem to have their own measurement. “There seems to be no conclusion on the success criteria” [15]. Even though previous studies had conducted extensive reviews of the research literature on IS success, DeLone & McLean seems to have given the first valuable categorization of the different measurements used in IS research. In an effort to find what they call the *dependent variable* for Information Systems success, they studied a total of 100 empirical research studies related to the subject from the period 1981 to 1988, and came up with an idea to separate success measures based on the different levels of information defined by Shannon and Weaver (1949) [21]. This resulted in six distinct categories or aspects of information systems that may be used to describe success; System quality, information quality, use, user satisfaction, individual impact, and organizational impact. The categories reflect the differences in research focus, ranging between the system itself, the information it generates, the use of the system, and the effects (“impact”) of the system on decisions and performance. A summary of the different categories and the corresponding measures is listed in Table 2.2. Their work is often considered to be one of the pillars in the process of forming a structure to the diversity of measures, and have been widely discussed and debated since then (e.g. [22]). From Table 2.2 it is evident that the number different aspects of information systems have created a huge number of measures, and that we need a way to combine the appropriate ones.

¹http://en.wikipedia.org/wiki/Project_management#Project_management_triangle

The Role of Context

DeLone & McLean (1992) argued that when measuring information systems success, "researchers should systematically combine individual measures from the IS success categories" [22]. However, their study exclusively targeted prior empirical research, and accordingly such an approach may not necessarily apply in practice. As mentioned earlier, a variety of subsequent research questioned their approach, including the work of Seddon et. al (1999) [22]. They validly pointed out that different measures are appropriate depending on the particular context of the system in question, and that a "systematic

Category	Measures	Description
System Quality	Resource utilization, investment utilization, reliability, flexibility, response time, turnaround time	The quality of the system performance
Information Quality	Information accuracy, output timeliness, completeness, relevance (usefulness), precision, currency, formatting (readability), informativeness, credibility, accessibility	The quality of the information that the system generates / produces
Use	Computed use, reported use, user connect time, frequency, amount or fraction of functionality utilized, who are the users, use through others, levels of use (purpose of the use), appropriate use	The actual amount of use
User Satisfaction	Overall satisfaction, enjoyment, software and hardware satisfaction, top management satisfaction, information satisfaction, development project satisfaction, graphical interface satisfaction, user complaints	The users subjective opinion and satisfaction with the system and the information that is generated
Individual Impact	Improved performance and productivity, better understanding, influence on decision-making (e.g. effectiveness), change in user-activity, change in perception of usefulness of information systems, learning value	The effect of information on the recipient
Organizational Impact	Cost reduction, increased revenue, productivity and efficiency, extent to which it is applied to critical or major problem areas of the firm, Return on Investment (ROI), innovation, product quality, contribution towards achieving organizational goals, staff reduction, change in industry structure	The effect of information on organizational performance

Table 2.2: DeLone & McLean Information Systems Success Measure Categories

combination” as DeLone & McLean suggested, would not be sufficient [22]. ”There are important differences deriving from organizational, user, and system variations which can modify the view as to which attributes (success measures) are important” [23]. Seddon et. al. instead proposed a two-dimensional space for structuring success measures in research, creating a space of 30 different categories based on these two dimensions. They suggested that the space should be defined by *system type* and *stakeholder* of which perspective the evaluation was being made. The classification of each of their dimensions is given in Table 2.3 and Table 2.4. The incentive for such a division was to provide a platform to be able to identify appropriate measures given a particular context, which they claimed was not clear in the literature at the time. In particular, Seddon et al. criticized the original paper by DeLone & McLean in that it ”does not recognize explicitly that stakeholders in an organization may validly come to different conclusions about the success of the same information system” [22]. They accordingly provided a study illustrating how subtle differences in stakeholder perspective can produce significantly different evaluations of the same system, and argued that it seems obvious and that their classification shows, that very different measures are necessary for measuring information systems effectiveness in different contexts.

However, limiting system context to these two dimensions seems like an invalid simplification. Some research efforts seem to implicitly state that information systems are deemed to be effective only if they contribute to organizational effectiveness (Thong and Yap, 1995). Others have claimed that information system effectiveness, popularly has been defined as the extent to which a given information system actually contributes to achieving organizational goals, i.e. its effect on organizational performance [24]. Cameron and Whetten (1983) goes as far as to claim that no universal set of links between variables and effectiveness can ever be known because the meaning of the dependent variable continually changes due to the dependency to the model of organizational effectiveness used [25]. Cameron (1980) had at the time already stated that evaluating organizational effectiveness requires selection of the most appropriate criteria, which would differ from organization to organization [26].

To understand the significance of organizational context on information technology, we do not even need to consider different types of organizations. Robey and Sahay (1996) [27] provided a comparative study of the implementation of a particular information system in two quite similar and comparable organizations. Based on social interpretations of different stakeholders, they show that similar (i.e. almost identical) technologies may produce different social consequences, even in comparable organizational settings. They ground their theory on earlier studies that have supported the commonly assumed conclusion that organizational context influences the consequences of information technology, and in turn that social interpretations of these technologies are related to this organizational context and the social processes surrounding the implementation. Their results strongly indicate that organizational aspects form an important part of the context that affects information systems.

In addition, measures within each category may apply differently when considering different projects. Project management (stakeholder group 4) in two different projects both evaluating a single IT application (system type 2) may, possibly due to different contexts, validly select different criteria as basis for their evaluation. In addition the

System Type
(1) an aspect of IT design or use (e.g. algorithm, query language, or user interface)
(2) a single IT application in an organization
(3) a type of IT or IT application (e.g. data warehouse)
(4) all IT applications used by an organization or sub-organization
(5) an aspect of a system development methodology (including reengineering)
(6) an IT function (or its management) in an organization

Table 2.3: Seddon et. al System Types

Stakeholder Group
(1) Independent observer
(2) Individual
(3) Group
(4) Management or owners
(5) Country

Table 2.4: Seddon et. al Stakeholder Groups

authors admit, like DeLone & McLean, that the choices of categories were not always clear cut, in that some measures did not fit nicely into one single category [22].

Hence, context seems to have an unknown number of dimensions, and consequently that it can not be limited to some predefined set. Accordingly, it seems difficult to find a framework that is sufficient enough to provide us with an explicit way of determining the criteria or measure. Hence, it seems more appropriate to investigate how dynamic selections of criteria supports satisfies our purpose. However, it seems necessary to clarify the boundaries of the concept success first.

2.1.2 System Success vs. Project- and Project Management Success

Altogether, the work of both DeLone & McLean and Seddon et. al. made a great contribution towards a structure in the space of research on success measures. However, they both considered and emphasized on measures of system effectiveness, rather than measures of project effectiveness, and the role of IT has clearly been refined multiple times since then. Already, there is no such thing as pure IT projects [28]. Regardless of whether investments are more IT-intensive or less so, they are all business projects [28]. Projects are increasingly part of programs or portfolios these days [14], and such IT portfolios must not only enable an organization’s business strategy, but contribute to it [29]. Originally, information systems was considered operational rather than strategical, but due to the recent shift in IT ”from a technical support to a business ally” [29], the role of information systems has drastically changed over the time.

Scott Morton (1991) argued that all organizations, in order to be effective in the future, would need to be transformed with computer-based technologies [30], and accordingly, organizational transformation with information technology has become an important business objective to many organizations. In order to create business value, companies now strive to make projects help them move beyond positions of competitive disadvantage or parity [14]. Organizations often observe that traditional structures are

ineffective in producing the desired levels of productivity, customer service, employee welfare, and shareholder value, and appropriately seek transformation through IT [30]. In addition, Robey and Sahay (1996) concluded that organizational transformation is not accomplished through the mere installation of new systems with greater computational powers [27]. On the contrary, their results supported the idea that the success of technology-enabled organizational change and the associated social consequences depend upon its social meanings more than on its material properties [27]. Worth mentioning is that new information systems still have to meet demanding technical requirements and high performance standards, but for the success of today's systems it is rarely considered the dependent variable. Altogether, this indicates that IS/IT success may no longer be limited to the success of the system, as system effectiveness itself does not necessarily indicate success. Rather, measures of IT success need to incorporate the success of the project as a whole.

It is additionally worth mentioning that recognizing that pure IT projects no longer exist, does not in any way imply that all projects are IT projects. Hence, the term *IT project* is still valid, as we still need to separate IS/IT projects from projects that have no relations to IT. Consequently, the term will be frequently used throughout the remainder of this thesis to refer to projects that in some way involves changes to information systems or information technology.

The Project- and Product Life Cycles

Literature on project success has claimed that our view on success has been polluted due to our narrow focus on the *project life cycle*, rather than the *product life cycle* [14]. For IT projects, the product will typically correspond to the system, and the product life cycle will therefore last until the system is no longer in use. The PMBOK[®] *Guide* (2004) [31]² describes the project life cycle as a subset of the product life cycle, with the product life cycle typically including additional phases after project termination [14]. Jugdev and Müller (2005) state that measuring success by looking exclusively at the *project phases* only gives a partial impression, and that a more holistic understanding of success can be achieved by also measuring success during the remaining product life cycle phases, when effectiveness measures are taken into account and input from different stakeholders is included [14]. However, the *PMBOK[®] Guide* considers projects in general, and their results do not seem to apply just as much to IT projects. In contrast to the other industries, the software development life cycle often include the operations phase and, hence, represent a better connection to the product life cycle [14, 15]. Hence, for IT projects, looking at project success instead of system success seems valid. An illustration of the product and project life cycles can be seen in Table 2.2.

²Guidelines, rules and characteristics for project, program and portfolio management provided by the Project Management Institute (PMI) global standards.

PHASES		OTHER	SOFTWARE DEVELOPMENT
Product Life Cycle	Initial Phase: Conceptualization, Planning	Feasibility	Proof of Concept Cycle
	Intermediate Phase: Production / Implementation	Planning and Design	First Build Cycle
		Production	Second Build Cycle
	Final Phase: Handover	Turnover and Start Up	Final Cycle Including Testing Final Build
	Operations: Utilization		Deployment
Decommissioning: Closedown			

Figure 2.2: Overview of the project and product life cycles (PMBOK[®] *Guide* [31])

Project Management Success

Jugdev and Müller (2005) also makes a distinction between *project success* and *project management success* [14]. De Wit (1988) discusses the concept of project management success in terms of the iron triangle (time, cost and scope), and indicates that project success involves broader objectives from the viewpoints of stakeholders throughout the project life cycle [32]. De Wit claims that most project management literature advocates that project management has three major objectives: a project must be managed on time, within budget and to quality/performance specifications. Their rationalization for a distinction is based on a research concluding on the irrelevance of these project management characteristics (*time and cost*) to the perceived success and failure of 650 completed projects in the USA [33]. Correspondingly, Cooke-Davies (2002) concretised a formal distinction between the two:

- *Project management success*, being measured against the traditional gauges of performance (i.e., time, cost and quality)
- *Project success*, being measured against the overall objectives of the project

Apparently, these terms are not the same, but the appropriate place to draw the line between them seems to remain confusing. Who would be responsible for striving after project objectives if not project management? Jugdev and Müllers even seems to be inconsistent in their distinction between the two. So; do we really need both of these two terms? De Wit (1988) states that:

If one defines success in terms of the achievement of objectives, then the answer depends on whether the objectives for the project and for the project management activity are the same or not.

In general, the answer depends on what we consider to be the responsibility of the project management function. Unlike the literature referenced by De Wit (1988), Wikipedia³ states that "The primary challenge of project management is to achieve all of the project goals and objectives [34], while honoring the preconceived constraints [35]", and that "The primary constraints are scope, time, quality and budget [31]". This latter approach

³http://en.wikipedia.org/wiki/Project_management

to project management seems more intuitive, and furthermore appealing as it reduces the possibility for limiting project managers' responsibilities to the *project life cycle* and in so discourage attitudes of "that's not my problem" [36]. However, this is still dependent on our definition of project management, and as such, one of the keys to an answer to this question seems to be deciding on what we really want project management to be.

To come up with a reasonable answer of what we want project management to be, it seems important to have a basic understanding of the evolution of project management over the years. Fortunately, Jugdev and Müller (2005) provide us with a retrospective look at our evolving understanding of project success over the last 40 years [14]. They studied the main contributions to the research on project management from the 1960s until today, and came up with a four period scheme as shown in Figure 2.3. Below the figure is a brief summary of the retrospective.

PROJECT LIFE CYCLE					
PROJECT LIFE CYCLE					
Conception	Planning	Production / Implementation	Handover	Utilization	Close Down
		Period 1: Project Implementation and Handover (1960s - 1980s)			
Period 2: CSF Lists (1980s - 1990s)					
Period 3: CSF Frameworks (1990s - 2000s)					
Period 4: Strategic Project Management (21st century)					

Figure 2.3: Overview of project management success retrospective across the project and product life cycles (Jugdev and Müller [14])

Period 1 During the *first period* (1960s - 1980s) the project managers focused on getting a project done, making sure it worked, and getting it out the door. Both practice and literature from this period promote the iron triangle as the foundation of project management. As we can see from the figure, project management at this time would typically only cover the *production / implementation* phase, and as the implementation phase is efficiency-oriented, project management was only considered operational. This narrow *project-centric* view of success has later been referred to as *traditional project management practices* [36].

Period 2 In the second period, the core of project management was focused on developing CSFs ("*Critical Success Factors*"). The literature started to emphasize the importance of stakeholder satisfaction as an indicator of project success, but success was a rarely agreed-to construct. Some pointed out that users often were concerned with the satisfaction criteria, rather than the completion criteria. However, well into

this period, the iron triangle continued to be used to describe project management success. Project management was still considered operational, and concepts like organizational effectiveness and change management were barely mentioned.

Period 3 The third period was characterized by the emergence of CSF frameworks, and the entire literature now seemed to acknowledge that success is stakeholder-dependent. Some addressed that success is both subjective and objective, and that success varies across the project and product life cycle. However, the CSFs were still limited to the project life cycle itself, and project management was at first still considered operational. Wateridge (1997) noted that successful projects were more likely to emphasize product success, whereas unsuccessful projects often emphasized on the traditional time, cost and scope [15]. He also pointed out that time and cost constraints often made project managers focus on user requirements but ignore user satisfaction. Correspondingly, project success expanded during this period to include more than just the project life cycle. Additionally, the area of strategic project management literature emerged during this period. Interestingly, this was the time of the first CHAOS report, in which success was based on the *iron triangle*, a concept that for the most part no longer was considered the dependent variable of success.

Period 4 In the fourth period, one really started to acknowledge that it was desirable for project managers to take responsibility for project outcomes contributing towards achieving overall business objectives, despite challenges that arise due to the temporary nature of projects. Accordingly, some started to emphasize the responsibility of the project owner to implement an organization's strategy through projects. Hence, the understanding of project management as a strategic asset, became a key criterion for project success. As such, an era where project managers could deliver whatever was contracted without caring about the acceptance and usability of the project deliverables, had ended [14].

Jugdev and Müller (2005) stated that project and project management success are inextricably interlinked, and that success should be considered a combination of them [14]. They argued that we all know projects which have not been managed well from a project management perspective, but yet have been regarded as successful, and drew parallels between such examples and an oft-heard saying that "the operation was a success, but the patient died." However, this in general seems to be equivalent to saying that the project achieved what it was supposed to do (i.e. its objectives), but whatever we attempted to do in some broader context (e.g. with respect to organizational strategy), failed. Project management has therefore matured from being considered a purely operational function to be regarded as a strategic key to organizational success. Hence, as the purpose of the project management function now is clearly related to achieving project objectives, maybe even those that are aligned to the organizational strategy, the motivation for making a general distinction seems unclear. Altogether, it seems appropriate to look at project success and project management success as the same for the general case, and rather distinguish between them in cases where it appear to be necessary. Thus, there will be no distinction between the two during the remainder of this thesis, and *project success* will be used to refer to both.

2.1.3 The Appropriate Success Criteria

Until now, numerous different measures have been mentioned, and the general concept of success has been discussed. We know that different contexts generate different success criteria and in so the need for different measures. We also know that success must be considered in the context of the project, rather than in the context of the system, and that no ultimate conclusion on the appropriate criteria can be drawn. Hence, there seems to be a need to explore dynamic selections of success criteria that takes the differences of context into account and that incorporates project success rather than system success, and then to discuss how these specific selections suit our purpose.

Effectiveness vs. efficiency

Initially, simple metrics were used to measure success, such as the iron triangle (time, cost and scope) [14]. Such measures have widely been referred to as *efficiency measures*, as opposed to *effectiveness measures*. Generally, efficiency is known as "doing things right", while effectiveness is known as "doing the right things" [14]. The two have been distinguished in that efficiency is about maximizing output for a given level of input and has been described as *tangible*, whereas effectiveness means achieving goals or objectives and has often been considered *intangible* [14]. Others have named these measures *hard* or *quantitative*, and *soft* or *qualitative*, respectively [37]. Interestingly, *effectiveness* is generally considered more challenging to measure, and often takes longer to determine [14]. Consequently, effectiveness measures have often been left out from evaluations [14]. However, efficiency measures further establish project success as an operational concept, whereas effectiveness measures benefit in establishing project success strategically. Hence, it seems valid to claim that efficiency measures like time, cost and scope no longer are sufficient alone to define success, and that effectiveness measures are needed. That said, it seems that research mainly agree that both efficiency and effectiveness measures in some way should be included [14]. Nevertheless, it has been recommended to measure a few measures well, rather than having numerous measures without addressing them properly [14]. However, projects have been considered successful regardless of cost and time overruns, while projects also have been considered failures even though cost and time constraints have been maintained [14]. Success may by reasoning appear to be affected by, but not dependent on efficiency-oriented measures like time and cost. Altogether, effectiveness seems to be critical to project success, while efficiency on the other hand seems less critical. Hence, the appropriate selection of success criteria seems to be *effectiveness-oriented*, while complying with *efficiency-oriented* constraints like time and cost may more appropriately be considered success factors.

Stakeholder Satisfaction

User satisfaction has been considered the most useful assessment of information systems *effectiveness* [18], and also the most widespread effectiveness success measure [10, 12]. This is reasonable, as "it is hard to deny the success of a system which its users say that they like" [10], and furthermore that a "good" system perceived by its users as a "poor" system, is in fact a poor system [38]. However, user perceptions of the system

represent only one viewpoint to the multiple dimensions of the system's impact [18]. Additionally, as we now need to recognize project impact rather than system impact, and as users are not the only interested parties in a project [15], it seems clear that the users' satisfaction is not the only interest to consider. Baker et al. claimed that all people involved in the development process need to be satisfied with the outcome of the project [33]. Similarly, success has been defined as "where the stakeholders are satisfied with the outcomes" [39], and as "where the stakeholders perceive an information system to be successful" [40]. Accordingly, the importance of stakeholder input when considering success has been emphasized by others as well [15]. Altogether, this implies that the one true criterion for success is what we refer to as *stakeholder satisfaction*⁴.

But we have already stated that no ultimate selection of criteria or measures can be made. So why are we considering this specific criterion? Stakeholder satisfaction is in fact a dynamic selection of multiple measures that incorporates the underlying success criteria of all the stakeholders. Hence, the elemental context of each specific project is possibly maintained by the stakeholders' expectations to the project.

However, this selection of subjective measures has been rejected widely due to irrational stakeholder perceptions. Thomas and Fernández (2008) claimed that stakeholders may perceive a project as partial failure due to unrealistic expectations, even though the project in fact was successful in achieving near-optimal results [16]. Their reasoning was rooted in that perceptions may be influenced by expectations which again may be unrealistic [42], justified by the observation that optimistic and unrealistic expectations may be considered regular human psychological behavior under uncertainty [43]. Yet, projects are also about managing expectations [14], and by successfully agreeing on what a project is meant to achieve at the outset of the project, stakeholders should know what to expect from the project, or at least what not to expect [15]. Thus, stakeholder satisfaction, despite its weaknesses, seems to have the potential of a highly valid measure for success, as long as necessary precautions are taken.

Nevertheless, when put up against our main purpose for defining success criteria, stakeholder satisfaction seems to be invalid. Agreeing on 'stakeholder satisfaction' as success criteria at the outset of the project, does not enhance the convergence of success criteria between project parties, as they will still be left with their own expectations as basis for their own satisfaction. Unfortunately, this observation seems to be missing from the current literature. Regardless, stakeholder satisfaction, despite seemingly being the most appropriate success measure, apparently is insufficient as the agreed criteria for what a project is meant to achieve. Thus, one needs to agree on some other more appropriate criteria.

Project Objectives

Other than stakeholder satisfaction, project objectives has also been suggested as the most appropriate criterion, and that the degree to which these objectives have been met determines the success or failure of a project [32]. In the same way as with stakeholder

⁴Stakeholder: For the purpose of this paper, a project stakeholder is any entity within or outside an organization who has an interest in the project as defined by Wikipedia [41].

satisfaction, each objective corresponds to one or more specific measures, making the project objectives another dynamic selection of criteria. However, each objective may be considered a criterion or a measure, and in the same manner it has been observed that *efficiency-oriented* and easily quantified objectives are employed, while *effectiveness-oriented* and qualitative objectives are ignored [24]. In addition, it is stated that objectives often do not represent the real objectives, and that underlying aims of involved personnel go unstated, as project management does not wish to state them explicitly (Alter, 1975) [24, 44]. Finally, project objectives are often set prior to project start in order to obtain funding [14], and may thus be constructed to increase these chances, rather than actually stating the desired destination.

Altogether, project objectives may thus seem totally unfit, both for measuring success and as selection of success criteria. However, apart from when stated on untrue or unreasonable basis, project objectives, like stakeholder satisfaction, seems to capture context in a way that no other success criteria is capable of matching. In addition, effectiveness has actually been defined as "achieving goals or objectives" [14]. As a result, project objectives appear to be the most appropriate selection of success criteria, if carefully and thoughtfully defined. Yet, more research is needed to assess whether project objectives still are immature in practice.

2.1.4 Evaluation of Information Systems

It has been suggested previously in this thesis that the real value of defining success may first of all be related to the effects of agreeing on expectations as to what a project is meant to accomplish. However, "The measurement of information systems (IS) success or effectiveness is critical to our understanding of the value and efficacy of IS management actions and IS investments." [12]. In addition, *evaluation* has been identified as one of four major issues (strategy, evaluation, design and development, and implementation) within the information systems discipline [45]. In addition, it has been stated that performing an intermediate or post-completion evaluation is a valuable exercise. Not so much to determine the success or failure in absolute terms, but to identify what went right and what went wrong in order to improve future projects [32]. Hence, evaluation of information systems will be briefly visited in this section.

As stated earlier, there is no such thing as pure IT projects. Very often the introduction of new information systems is related to organizational changes (Ref: Sec. 2.1.2). Hence, the evaluation of IT projects may be seen in conjunction with the evaluation of organizational change. Walsham (1993) indicated how the evaluation of information systems also could be split into *formative* and *summative* practices [45], as originally defined by Scriven (1963). Formative evaluation aims at systematic continuous feedback to designers and implementers during the process, while summative evaluation is concerned with assessing the outcomes compared to the initially specified success criteria in the aftermath [46]. It has been suggested that interpretive evaluation methods may be more vulnerable to manipulation by powerful interest groups, as this interpretive approach is open for multiple realities which again may help the powerful impose their own interpretations [47]. On the other hand, formal evaluation against a predetermined criteria may

be dangerous as decision-makers potentially may formulate non-real objectives [45]. This is among the lines of our previous discussion on project objectives as success criteria.

Information systems may be evaluated at various stages. Early stage evaluations, ongoing evaluations during the design and development process, and post-implementation evaluations are examples [45]. Many approaches to these evaluations have been suggested in the literature, however common for all of them is that information systems evaluation is difficult [45]. It has been suggested that evaluation should concentrate on the human and social aspects, rather than the mere technical aspects [45]. However, the benefits of information systems are often intangible, uncertain, and extremely difficult to quantify in a meaningful way [45]. It has been emphasized though, that effective evaluation means taking seriously and understanding the perspectives of individual stakeholders and interest groups [45]. Additionally, it has been stated that the evaluation process should be regarded as a means to encourage the involvement and commitment of stakeholders [45], and also that measures like ROI (*Return on Investment*) may under some circumstances be highly deficient in generating a real understanding of the costs and benefits of information systems investments [45]. Thus, stakeholder satisfaction may seem very appropriate as a measure for outcomes in formal evaluations.

2.2 Success Factors - A Formula to Success?

Various authors have identified, either from experience or research, a number of what they claim to be the critical factors that are important to project success [32]. Furthermore, every now and then, new lists of such critical success factors arise. It has already been suggested that no ultimate list of critical success factors can be found, and as such that the value of these lists is limited. However, the real value of these lists may be further limited by looking at what they really offer for project teams in practice.

The CHAOS reports provided by the CHAOS research project mentioned earlier, are among the sources of such lists. Their first report compared IT projects to construction projects and claimed that, "in the computer industry, failures are covered up, ignored and/or rationalized", as opposed to construction industry, in which failures were investigated and reports written on the cause of the failure [4]. Regardless of how valid this comparison happens to be, it was used as a rationale to make the focus of the research group to identify; (1) the scope of software project failures, (2) the major factors that cause failure, and (3) the key factors that can reduce project failures.

Their original report indicated that only 16.2% of all projects are completed on-time and on-budget, with all features and functions as initially specified, and came up with a list of success factors, based on a survey among IT executive managers' opinions on why they thought projects succeed. Since then, the research group has continuously published these reports, and the equivalent list of success factors from 2009 is compared to the original one in Figure 2.4. As we may see from the figure, *user involvement* and *executive support* seems to remain the two factors considered most important by IT executive managers. *Clear business objectives* seems to have been increasingly emphasized, while *clear statement of requirements* no longer seems to be considered one of the most important factors. This supports the observation that business aspects of IT projects are being considered increasingly more important, as opposed to the mere technical properties of the ending system(s). Worth commenting is also the weighting of an *agile process*. The rest of the list forms a mix of brand new factors and factors that in some way or another correspond to one or more elements from the 95' list. The CHAOS reports have repeatedly been criticized for lacking validity⁵, but as their figures and reports have attracted tremendous attention over the years [48], they serve as a good foundation for discussing their actual value in practice.

User involvement may be considered most important, but may also be considered one of the more, if not the most, complex aspect of IT projects [49, 50]. Hence, user involvement will serve as an example of how intricate each of these factors may be. It is essential to emphasize that user involvement in the CHAOS report is what we may refer to as *user participation*. Barki and Hartwick (1994) made a clear distinction between the two [51], however, there seems to be no consistent distinction between the two in subsequent literature. Hence, user participation and user involvement will be used interchangeably in the remainder of this report.

⁵The flaws of the CHAOS reports will be examined in the Discussion chapter (5)

The CHAOS report – Critical Success Factors

	1995	2009	
#1	User Involvement	User Involvement	-
#2	Executive Management Support	Executive Support	-
#3	Clear Statement of Requirements	Clear Business Objectives	↑#9
#4	Proper Planning	Emotional Maturity	NEW
#5	Realistic Expectations	Optimization	NEW
#6	Smaller Project Milestones	Agile Process	NEW
#7	Competent Staff	Project Management Expertise	NEW
#8	Ownership	Skilled Resources	↓#7
#9	Clear Vision & Objectives	Execution	NEW
#10	Hard-Working and Focused Staff	Tools & Infrastructure	NEW

Figure 2.4: CHAOS Critical Success Factors - 1995 vs. 2009

2.2.1 User involvement

User involvement was considered the most important success factor in 1995, and still in 2009. However, what does this observation actually tell us? Does it mean that user involvement is simply about the choice of involving users or not? Does it mean that the more you involve users, no matter how you do it, your chances of success are increased? These questions hopefully illustrate that user involvement may not necessarily be that straightforward. It has been stated that user involvement will enhance both system usage and user satisfaction, whereas user satisfaction again will lead to greater usage [52]. However, determining when, how much, and even if, user involvement is appropriate, is far from obvious [53]. Some have even stated that a lot of research indicating the benefits of user involvement have been poorly grounded in theory and methodologically flawed [53].

Throughout the history of IT projects, the emphasis on user satisfaction and user involvement has varied greatly. The early literature showed that project managers originally were focused on getting a project done and making sure it worked, with little customer contact and no long-term follow-up [14]. However, because of the competitive marketplace and attention to service and quality, customer satisfaction became increasingly important [14]. Hence, as user satisfaction is considered one aspect of quality [54], users started to receive more attention. The literature also started to focus on the importance of stakeholder satisfaction, including user satisfaction [14]. Baroudi et. al (1986) tentatively concluded that user involvement in system development leads to increased user information satisfaction, and increased system usage [52]. Barki and Hartwick (1994) concluded that users who participate in the development process were likely to develop beliefs that the new system is important, personally relevant, and actually that the system is good [51]. As they validly point out, through involvement users may develop feelings of ownership, and also a better understanding of how the system may support them in their everyday [51]. Indications that it may be more difficult to influence user perceptions about a system after implementation [51], also contribute towards an emphasis on user involvement during the development process. Consistently, user participation has been considered an important way of improving software quality and increasing user

satisfaction and acceptance [55].

User Centredness

The term *user centredness* has been used to indicate the level of emphasis on users during the design process [50]. *Weak* user centredness involves considering the users' needs during the design process, whereas *strong* user centredness implies active participation of users during the process [50]. The incentives for strong user centredness seems conclusive. Software designers often have little knowledge of the users' work tasks, and only users really seem to understand their own needs [50]. Moreover, transferring this knowledge to the designers may be considered complicated, as the designers often do not have the time or motivation to get to know the users, and as users may not be able to communicate their needs effectively [50]. Hence, involving the users directly into the design process may seem to be the best way to establish the consistent flow of knowledge that is needed [50]. Various approaches to this *strong user centredness* have been suggested. The Scandinavian Participatory Design approach for one, connects the development of high quality systems to continuous user participation [56].

However, it has been demonstrated that high user satisfaction may be achieved despite minimal user participation, and conversely that users may not be satisfied, despite high user participation [55]. Hence, more user participation may not be better in all cases [55]. Accordingly, an important question was raised; what other consequences does user participation have? [51]

Heinbokel et al. (1996) empirically showed that projects with high user participation experienced lower overall success, fewer innovations, less flexibility, and lower team effectiveness [50]. In addition, their results indicated that such negative consequences of user participation may be hidden at first and then become evident later in the process. Due to the differences in background, developers and users often share different and sometimes conflicting interests [49]. User participation therefore may increase interests to be balanced, and the number of relationships to be managed. Hence, Heinbokel et al. concluded that user participation may actually generate additional problems, and that the smooth functioning of software projects is more likely to be impaired. However, their measures were exclusively based on software designer evaluations. Hence, their results do not reject user centredness as a factor towards usability, functionality, nor user satisfaction [50]. On the contrary, their results indicate that user participation may negatively influence project performance in that the process itself may be more difficult, lengthy, and less effective [49].

User and Developer Satisfaction

However, subsequent research contradicts these results, and suggests that users may not be the ones gaining benefits from user participation as claimed earlier [49]. Subramanyam et al. (2010) conducted a study of user and developer satisfaction for both new and maintenance projects, measured against the degree of user participation [49]. The results of their questionnaire are given in Figure 2.5.

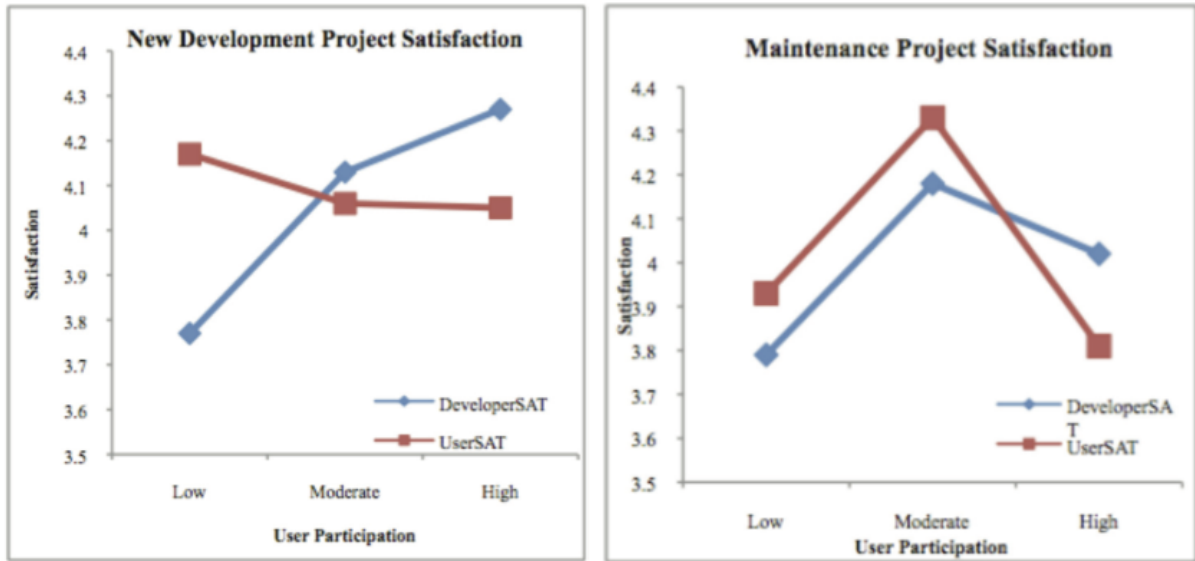


Figure 2.5: User and developer satisfaction in new and maintenance projects respectively (Subramanyam et al. [49]).

For *new development projects* (left), these results indicate, as opposed to Heinbokel et al. (1996), that developer satisfaction actually is correlated to user participation. They also indicate that user satisfaction and user participation on the other hand, is negatively correlated. Under circumstances of minimal user participation, developers were likely to find it difficult to resolve requirement ambiguities, while users were less likely to expect or demand as much, and thus ended up being more satisfied with the ending result [49]. With moderate user participation, both users and developers shared relatively high and similar levels of satisfaction, giving a minimal gap between their perceived satisfaction. Although neither users nor developers reached their maximum satisfaction with moderate user engagement, they seemed to reach a common ground in such projects [49]. However, when users engaged heavily, their expectations may have increased correspondingly, making them unrealistic and thus very unlikely to be satisfied [49]. Developers, on the other hand, seemed to appreciate high user participation in new development projects, possibly due to the complexity of new projects [49].

For *maintenance projects* (right), on the other hand, their results suggest a higher correspondence between user and developer satisfaction measured against user participation. However, nor in development projects did high user participation generate the highest average satisfaction. In cases of moderate user participation, both users and developers seemed most satisfied. On the contrary, users and developers seemed less satisfied in cases of lower and higher user participation. The deviations between user satisfaction in new and maintenance projects with low participation may be rationalized by the users' expectations. Due to users' knowledge and perceptions of the already existing system, they may also have opinions and theories related to potential opportunities of improvement. These opinions may again generate expectations, which may arise even without any involvement in the process. The reduced user and developer satisfaction in cases of high participation, may be explained by the increased number of conflicts arising due to different interests [49].

Overall, these results indicate that for both types of projects, moderate user participation generates the highest average satisfaction levels. That said, this may not necessarily be what to strive for. The real value of these results seems to be related to the observation of potential trade offs between achieving utmost satisfaction while minimizing potential user-developer conflicts [49]. However, to evaluate the trade-offs the figures need more accurate investigation. The graphs in Figure 2.5 may manipulate the perception of the results, as the lower parts of the scales are left out. Hence, the variance in satisfaction levels may actually seem more extreme than they really are. In reality, the actual decrease in user satisfaction in new development projects between low and high participation, is only close to 5%. The increase in developer satisfaction between the same cases on the other hand, is approximately 10%. Thus, the actual weighting of the importance of each groups' satisfaction, pose the real key to determining what really is desirable.

Another interesting observation is that user expectations seems to be the most significant influential factor for user satisfaction. In almost every case, low user satisfaction is partly justified by high user expectations [49]. For developers on the other hand, low satisfaction is either interpreted as difficulties with ambiguous requirements, or due to conflicting interests between users and developers. Hence, managing user expectation, and avoiding any unnecessary user participation, while still supporting developers in struggling with ambiguous requirements, seem to be one strategy to higher satisfaction. In this respect, the introduction of agile development methods and its consequences on user involvement may be of great interest.

The Evolution of IT projects - The Impact of Agile Methods on User Involvement

Traditionally, plan-driven methodologies with life-cycles like *the waterfall model* have dominated the software development arena [57]. However, suggestions on how *agile software development* improved the process initially entered the literature over ten years ago [58], and seem to have made a huge impact on software development since then [59].

The traditional methodologies focus on processes, while agile methodologies are centered around people [57]. In traditional development, customer input during specification development is important, but participation is minimal in other activities [57]. In agile development on the other hand, developers typically work in small teams with active team members from the customer, representing the system users, and attending in collaborative decision making [57]. Collaborative decision making involving stakeholders with diverse backgrounds and goals, jointly agreement on features to be implemented, and the critical role of customer representatives, is thus characteristic for agile development [57]. Hence, researchers have found that the customer involvement enabled by agile methodologies provides an arena for discussions, which have resulted in better collaboration [59]. This theory of improved collaboration between costumer and developer has been supported widely [59].

Agile methodologies in general seem to limit unnecessary user involvement, in that only selected customer representatives participate in the agile team(s), and constitute

the role of an intermediary between users and developers [57]. As a result, agile methodologies seem to contribute towards the limitation of user expectations that arise due to participation, while at the same time actively supporting developers in decision-making. Hence, agile development methodologies offer benefits over traditional development which makes them very attractive.

However, nothing is perfect. A central concern for agile methods is to attend to the real needs of the customer, which are often not stated explicitly in a more or less complete requirements specification [59]. Literature has also suggested that introducing agile development methods likely will pose potential challenges in organizations tightly coupled with traditional methods [57]. Neither culture, nor the mind-sets of people can easily be changed, and the change of norms related to decision-making, distribution of authority, tacit knowledge, etc., may be difficult to handle for everyone [57]. Altogether, agile methodologies may be considered demanding, and it has been emphasized that little evidence suggest that agile principles will be successful in the absence of competent and "above-average people" [57]. It has also been suggested that the use and results of plan-driven and agile software development methods both yield the same levels of customer satisfaction [60], and hence that both philosophies serve their own purpose. Regardless, it is undeniable that the agile methodologies seem to have become increasingly popular, both among developers, customers and students [59].

Altogether, even though agile development enforces principles that are attractive with respect to user involvement, awareness of challenges related to their involvement still seems critical. In the absence of a unified agile approach, organizations must decide on which approach that best serves their organizational context [57], and be aware that none of them eliminate all challenges related to user involvement.

Ethical Issues

Some of the challenges that remain complex with agile development, are the ones related to *ethical issues*. System development for supporting work, may require that some social norms, values, priorities, and positions are explicitly stated in an unambiguous form, to generate basis for design decisions [61]. However, explicitly stating such implicit political and possibly conflicting and competing interests may generate problems [61]. Such problems may also involve deciding whether requirements demanded by some are more worthy of attention than others' because of their education, social background, etc., which brings up the discussion of system designers' and developers' role in this process [61]. Wagner (1993) illustrated the importance of awareness related to these issues, described by her as the *social context*, and pointed out how system designers and developers are not spared from making their own judgments and opinions.

User Involvement in Practice

The literature on user involvement is exhaustive. However, the literature is far from conclusive. We have numerous studies contradicting the results of each other, indicating that user involvement is far from straightforward. However, insufficient amounts of literature

seems to investigate how modern project teams struggle to involve their users. Hence, investing efforts in understanding how project teams and organizations attempt to cope with these inconclusive opinions on user involvement in practice, seems reasonable.

3

Research Method

This chapter describes the case studies in detail. The first section is dedicated to the purpose and design of the studies. Subsequently follows a detailed description of the cases studied, and lastly an evaluation of potential weaknesses following the choice of method.

3.1 Research Design

3.1.1 The Purpose of the Study Revisited

In order to present the design of the research it seems important to revisit the purpose of the study. Hence, this section makes an effort to concretize the discussion of research question from the introduction.

The Appropriate Selection of Success Criteria

Based on the theoretical background provided in Chapter 2, project objectives may have the potential of being the most appropriate selection of success criteria, as the selection will differ between projects, and in some ways possibly capture the context that surrounds them. Yet, research has questioned the quality of objectives in practice, and hence suggested that they may not be sufficient. Thus, there is a need to further investigate what is needed to make the use of project objectives as success criteria a viable option, if possible. Furthermore, it seems appropriate to investigate whether the achievement of project objectives is emphasized at all when success is assessed by various project stakeholders, and if not, what criteria they consider basis for their assessment. These matters will correspondingly be the first purpose of this study.

User Involvement in Practice

Furthermore, the real value of lists of critical success factors (CSFs) has been questioned even further, as there is more to each factor than just stating them. An example is the recurring explication of user involvement as the most important factor. The literature is

providing us with conflicting results regarding almost every aspect of user involvement, which makes it very challenging to conclude on how to best involve users in IT projects. User involvement is therefore clearly like success not a 'black and white' concept. Hence, merely stating that user involvement is an important factor to success apparently seems to have little value. However, little research seems to investigate how project teams attempt to cope with these conflicting results in practice, and how this affects the users. Hence, understanding user involvement in practice may provide us with a better platform to evaluate the value of the CSF lists, and will be the secondary purpose of this study.

3.1.2 An Interpretive Study

Research may be classified into different research paradigms. A paradigm has been defined as "a broad view or perspective of something" [62], "a set of shared assumptions or way of thinking about some aspect of the world" [63], and as "patterns of beliefs and practices that regulate inquiry within a discipline by providing lenses, frames and processes through which investigation is accomplished" [64]. Hence, the various paradigms are characterized by methodological differences in their approaches to conceptualizing and conducting research [64]. Orlikowski and Baroudi (1991) identified three dominant paradigms in modern literature on information technology [65]; positivist, interpretive and critical research. The main differences between these paradigms is listed in Table 3.1.

Characteristic	Purpose	Beliefs
Positivist	Conclude on universal laws, patterns and regularity	<ul style="list-style-type: none"> • One truth exists • Objectivity is critical
Interpretive	Understand phenomena through the meanings that people assign to them	<ul style="list-style-type: none"> • Multiple truths and realities • Different people have different perceptions, needs and experiences
Critical	Contradict existing theories and norms	<ul style="list-style-type: none"> • Fundamental contradictions exist • An objective reality exists

Table 3.1: Research Paradigm Differences [63, 65, 66]

This study acknowledges that multiple perceptions of the reality exists, and attempts to provide a better understanding of these different viewpoints, rather than concluding on one universal truth. Neither does this research attempt to prove the incorrectness of existing literature. On the contrary, this study embraces the heterogeneity of the results in information technology research, and makes an effort to enhance our understanding of this diversity. Hence, this research takes the approach of the *interpretive*

paradigm. In interpretive tradition, there are no correct and incorrect theories, but there are interesting and less interesting ways to view the world [45]. Interpretive methods of research are based on the idea that our knowledge of reality is a social construction by human actors that applies equally to researchers, and hence that no objective reality can be discovered [45]. These interpretive methods have been identified as suitable in research aimed at producing an understanding of the context of information systems, and the process in which information systems influences and is influenced by its context [45].

In interpretive research, the researcher's background and values will affect both the process and the results. Hence, an explanation of how data were collected, and reasoning on how they were interpreted, is critical to this type of research.

3.1.3 A Qualitative Study

Information Systems research has been conducted with a wide range of various research methods (i.e. methods for collecting and analyzing data). Each method has its respective advantages and disadvantages over the others, depending on the desired approach of the study. The process of selecting between the different methods is therefore an important part of every research as it will in every way affect the results. Two distinct studies may have totally different approaches to the same research problem, and the suitable methods for each of the studies may therefore differ a lot.

In essence, research approaches may be divided into two categories; Qualitative & Quantitative. In broad terms, they have mainly been separated by the objective or purpose of the research. The purpose of qualitative research is often to gain insight and understanding of the underlying reasons and motivation, to be able generate ideas or hypotheses about a certain problem or question, while the purpose of quantitative research is often to quantify data to be able to generalize the results, sometimes related to testing existing hypotheses. Naturally, the qualitative methodology shares its philosophical foundation with the interpretive paradigm, while the quantitative methodology shares the foundation of the positivist paradigm [64]. Hence, in modern practice, interpretivism may be equated with qualitative research, whereas positivist research may be considered more quantitative. As such, the qualitative methodology clearly seems most appropriate for this study.

This choice of methodology may be further demonstrated by looking at what each approach has to offer. Examples of qualitative methods are interviews, discussion groups and observation, usually representing a small number of case studies. Examples of quantitative methods on the other hand, are surveys / questionnaires and short on-street or telephone interviews, often representing a large number of randomly selected respondents or participants. It is important to emphasize that this is the prevalent division, but methods that normally would belong to one category may be used to supplement the results of methods from the other category. The actual differences may first arise when selecting an approach for analyzing the data. It is also important to notice that one of the categories are not essentially better than the other, they are just appropriate for different purposes. We need both types of studies, as one of them is not enough. Qualitative studies are too time-consuming to test and generalize hypotheses in practice, but we won't be able

able to get a full understanding based on surveys and short interviews. As a result, both approaches are equally important.

The purposes of this study was to provide a better understanding of project objectives as basis for evaluation of success, and in parallel how user involvement is carried out in practice. It was therefore natural to select a qualitative research approach. If a quantitative approach was to be selected, and the understanding was to be based on responses to a survey, the results would probably be more confusing than informing. The results would most certainly both support and contradict some existing literature, however due to the short time frame of the study, the results would probably not be sufficient to make any conclusions. Performing one or more case studies, on the other hand, allows for the possibility of discovering something valuable to improve our understanding.

However, there is explicitly one observation that makes the qualitative approach the only applicable choice for this study. The idea that success can be reduced down to one specific set of criteria and factors, stems from a quantitatively oriented thinking. It is based on quantitative studies that have resulted in this generalization. Hence, as this study is based on the hypothesis that no such generalization exists, the qualitative approach was needed, and correspondingly selected.

3.1.4 A Case Study

Qualitative studies may be divided into different research types. Cresswell (1994) distinguished between five of them; The Biography, Phenomenology, Grounded Theory, Ethnography and Case Study [67]. Due to the nature and available time of this study, the *case study* was in fact the only applicable alternative. However, it has been pointed out that the most appropriate method for conducting empirical research in the interpretive tradition is the in-depth case study [45]. Hence, the choice of case studies as research method was obvious.

3.2 The Study

The study was performed over a period of approximately 8 months, in which two cases were investigated. Both cases were selected independently, and they were studied separately, in that they did not overlap. However, a report was produced in the aftermath of the first case study, on which basis this thesis and the second case study was constructed.

3.2.1 The Cases

In this section the choice of cases and the each specific case is presented. However, in order to reduce the complexity experienced by the reader, some irrelevant details have been left out in addition to some simplifications that have been made.

The Choice of Cases

The research problems that I wanted to investigate were quite general, and hence I wanted to obtain a realistic understanding through a *typical case*. I predicted that the results would depend highly on the projects, regardless of industry or type of system. Thus, no projects were considered more optimal than others. However, possible weaknesses of the selected cases is discussed later in this section, when the actual role of each case is discussed.

Originally, a project in the health sector was selected, but the project manager eventually did not see the value of participating. Instead, the first case (A) was the implementation of a public transportation ticketing system, while the second case (B) was three parallel projects that were part of a modernization program in a government agency responsible for housing politics.

Case A

The first case study was conducted on the implementation of an information system for electronic ticketing on public transportation by bus in one specific county. In this specific county, an organization owned by the county had the administrative responsibility for the development, operation, and coordination of public passenger transportation. This organization, as required by law, announces a tendering for driving bus in the different zones of their county. As such, a large amount of external operators of various sizes and with different levels of experience collaborated on providing public transportation services within the same county. However, as the passengers should perceive the public transportation as one common service, the same electronic ticketing system needs to be used by all operators. The county had a population of about 250 000 people, which is about average (Exact average 265 856¹). The public transportation was at the time of this study limited to bus. Railroads also existed, but as they stretched across counties, they were administrated by a national company, and did not explicitly compete for passenger transportation within the county.

The project was officially started in 2007, but planning was initiated as early as in 2005. At the time of project initiation, the public transportation was administrated by a private company as part of a cooperation with two neighboring counties. However, in 2009, this collaboration was ended, and the county formed a new organization by itself, to take care of the administration. Due to these structural changes, the project had a change of manager after approximately two years. The resulting outcome, a new electronic ticketing system, was *deployed in April 2011*. Hence, when this study was conducted, the project was in warranty, and no further development was done, other than error correcting and bug fixing. The system had first been tested in one part of the county, before it was rolled out completely some time later. As indicated earlier, electronic ticketing was already in place, so this was not the first system to be deployed.

The system is described conceptually in Figure 3.1. The system roughly consisted of four modules; A ticketing machine, a customer service module, a module for driver

¹Statistics from SSB, 1. januar 2013.
http://www.ssb.no/befolkning/artikler-og-publikasjoner/_attachment/114573?_ts=13ed599ab50

management, and a module for inspecting transactions. In addition, the system provided a transaction log to the accounting department, and an extensive number of reports to different entities. However, the reporting part of the system did not become a part of this study.

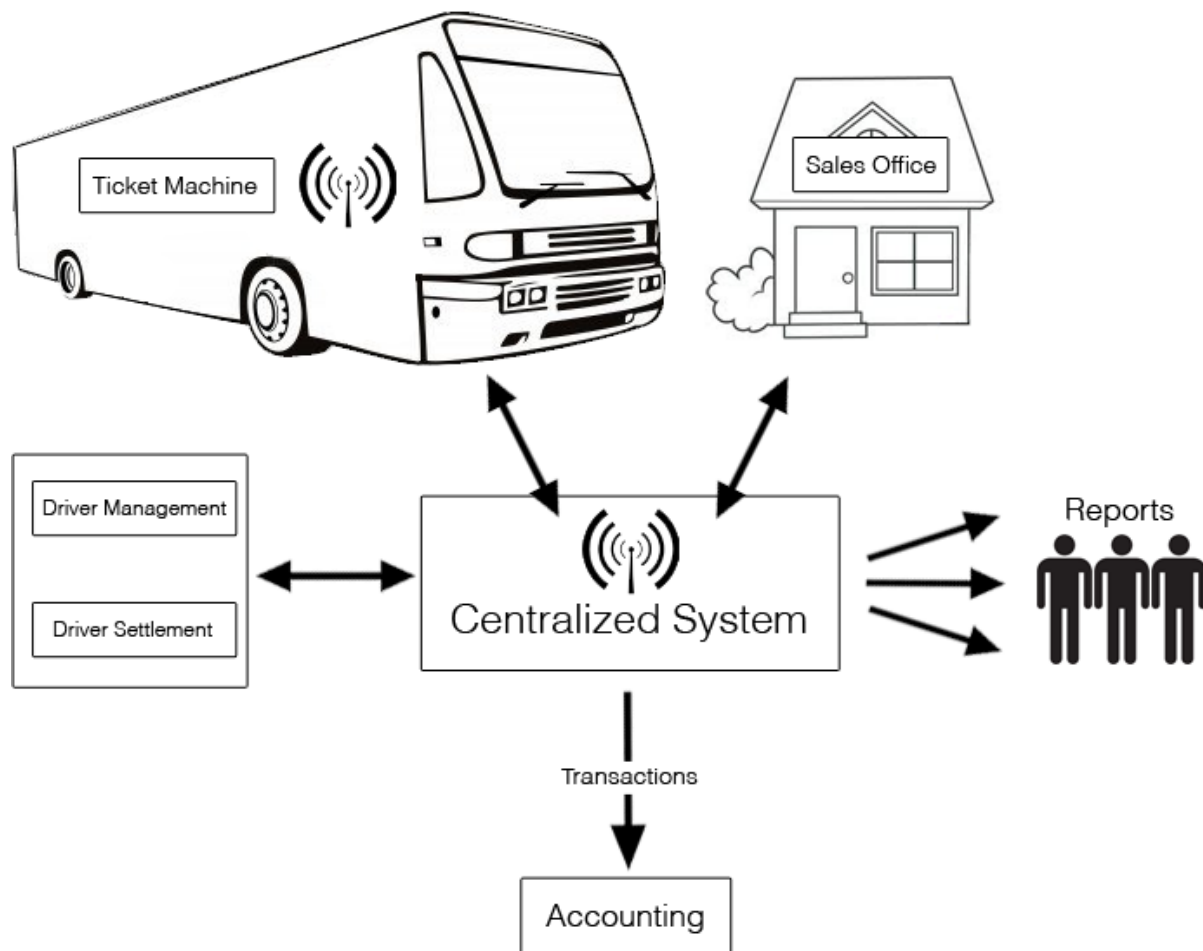


Figure 3.1: Case A: System Description

The Ticketing Machines

The ticketing machines were placed inside each bus, and additionally some were placed at the sales offices. Accordingly, the bus drivers were the primary users. When they started a route, they logged into the ticket machine by swiping their card, and when they were done they logged out the same way. The passenger tickets no longer required physical contact with the machines, in that the passengers no longer needed to put their card into a reader, but rather swipe their card on top of the reader. In addition, the ticket machines were now connected to a GPS² receiver, which kept track of the current stop at each time. Earlier, the bus drivers themselves had to update the machine to the current stop.

²The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth (...). It is maintained by the United States government and is freely accessible to anyone with a GPS receiver. (Wikipedia, 11.30.2012)

Customer Service

The customer service modules were placed at the sales offices. The sales offices allowed customers to check the current status and update their ticket cards. With the exception of the buses, this was the only place to buy tickets. The customer service modules were operated by the sales office employees, and as such, customers had no direct interaction with the system. Unfortunately, I did not succeed in getting in touch with any of the sales office representatives, but it was indicated that the sales offices did not previously have a customer service module.

Driver Management

One person was responsible for interacting with the solution for *managing drivers*. This module was used to register new drivers in the system, issue new driver cards, remove/replace old cards, etc.

Driver Settlement

When the drivers had finished their routes, they could make settlement back at the station. Each time they logged out of a ticket machine, they received a receipt confirming the transactions since they had logged in. When the drivers made settlement, they would fill out a piece of paper, on which they would staple their receipts. Then they would pay the accumulated amount in a banking terminal that was not integrated with the ticketing system.

Transaction Viewer - Settlement Inspection

Sometimes, either due to system errors or because the drivers forgot to log out when leaving the bus, the transaction log in the system would not match the drivers' receipts. To discover any such inconsistencies, settlements had to be crosschecked to confirm that they matched. As such, they had a solution for *inspecting the transactions* of each driver.

Case B

The second case study was conducted on a modernization program in a government agency responsible for housing politics. The agency provides housing support in terms of financial assistance to economically disadvantaged people in the society. Inhabitants themselves have to apply for such assistance through the municipals, and depending on the type of assistance applied for, the agency or the respective municipal processes the application.

The first phase of this modernization program had been started up mid 2012, and was expected to be completed in 2014. In advance, a pilot project had been conducted to derive a complete set of projects for the program, including the subsequent phases until 2020, when the program was expected to be finished. At the time of this study, the program roughly consisted of three main projects as shown in Figure 3.2, which had received highest priority from the steering committee, and was thus carried out first. A conceptual description of the projects is shown in Figure 3.4. As opposed to the first case, these systems were developed in-house by an internal development department.

Fortunately, all projects happened to be focused on the same *financial product* (i.e.

support scheme) - *housing allowance*. This allowed for a more complete understanding of everything. Housing allowance is a government-financed support scheme for partial coverage of housing expenses for households with low income, and is paid out each month.

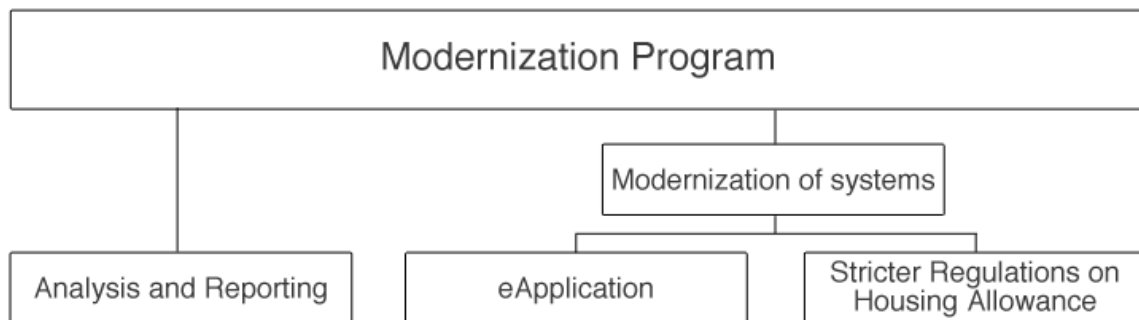


Figure 3.2: Case B: Program Description

Analysis and Reporting

The pilot project had showed significant indications that today's routines and solutions were lacking flexibility, data availability and data quality for satisfactory analysis and reporting, both internally and externally. Hence, it was concluded that an improvement was needed to provide a better framework for assessing the value of initiatives and efforts, and to provide better management information, in order to improve their housing politics. Consequently, a system for analysis and reporting was considered one of the most important projects to start with. However, it was concluded that developing analytics for all *financial products* would be impractical at the same time. Thus, housing allowance was chosen to begin with.

eApplication

The original application process for housing allowance is illustrated in Figure 3.3. The applicants had to fill out a paper-based application form, which then manually had to be entered into the system by municipal employees. This routine was considered both cumbersome and inefficient, and hence, electronic applications was concluded an important improvement.

Stricter Regulations on Housing Allowance

In Figure 3.3, it may be observed that applicants themselves had to report changes to the reported information. However, around the initiation of the modernization program, the national regulations on housing allowance were changed. These changes introduced new requirements regarding automatic and continuous inspection and control of reported data, and also stricter requirements to consent for collecting personal data. Consequently, this became first priority, even though it was not part of the original plan.

The Purpose of the Different Cases

Despite the cases being selected independently, they ended up serving the same, while at the same time quite different, purposes. The first case was originally supposed to be the only case for the thesis. However, it turned out to be too static at the time of the study,

	Case A	Case B
Type of Organization	Public	Public
Size of Organization	Small	Medium
Projects	One	Multiple
Current phase	Operational	Development
Stakeholder groups	Few	Many
Program	No	Yes
Development	External provider	In-house
Methodology	Waterfall	Scrum

Table 3.2: Comparison of Case A & B

and it was therefore concluded that another case was needed in order for the study to have sufficient value. Hence, the first study was in many ways considered a pilot, although not by design. Correspondingly, experiences could be generated from the first case, in order to improve the second. Nevertheless, the two cases ended up complementing each other quite nicely. A brief overview of a comparison between the two cases is shown in Table 3.2. The two organizations had chosen remarkably different approaches. Additionally, the fact that the projects were at very different stages at the time of the study provided an opportunity of focusing on different aspects.

Case Weaknesses

As stated earlier, no projects were initially considered more optimal than others. How-

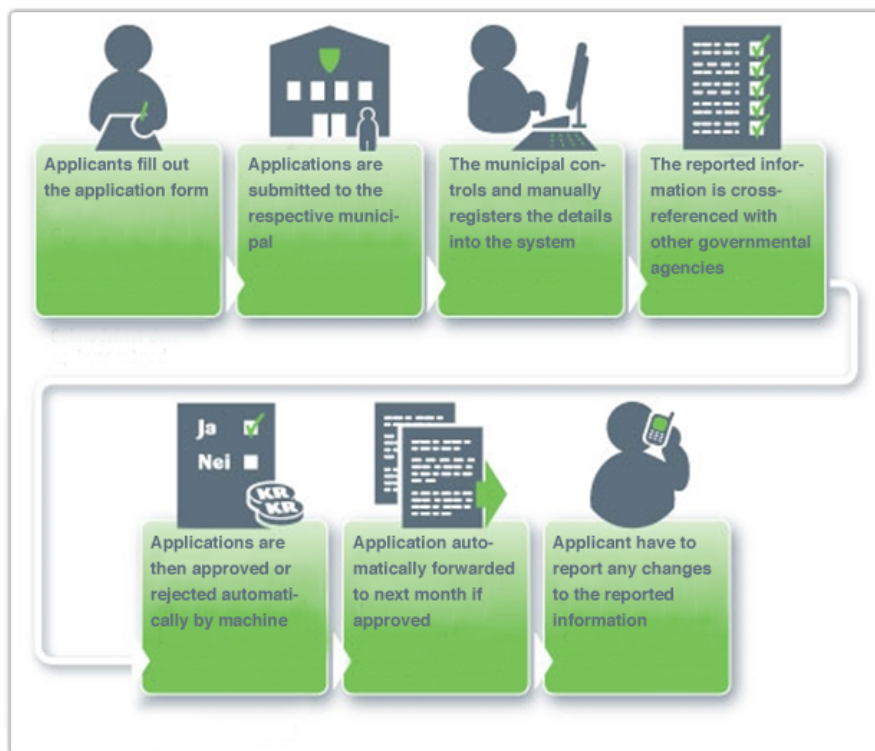


Figure 3.3: Case B: Original Application Process for Housing Allowance

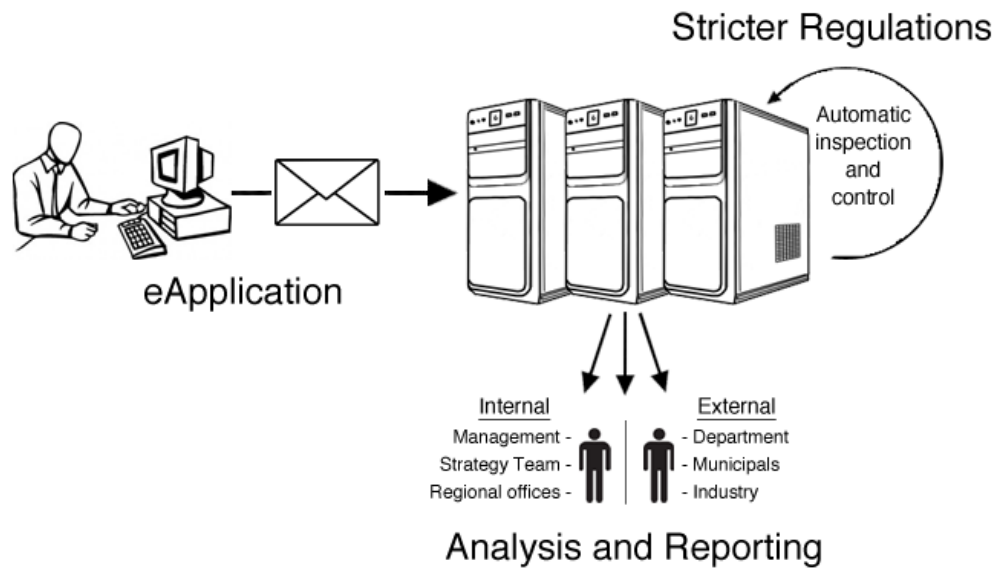


Figure 3.4: Case B: Conceptual system and project description

ever, that does not imply that all cases would generate the same, or optimal results. Hence, the weaknesses of the selected cases are briefly discussed.

The cases represent very different projects in terms of industry and type of system(s) to be implemented. However, both of the cases were from the public sector, which may be quite different from the private sector. Most government organizations are non-profit and therefore naturally have different motivations for investing in technology. The focus of technology projects in government organizations are often related to service quality improvement while equivalent projects in the private sector often are driven by a different desire. As a result, projects in the different sectors may be quite different, and hence executed on quite different premises. It is clear that differences exist, and some claim that the failure rate of IT projects in government organizations is higher than in private organizations [68], while others claim that the typical reasons for failure are quite different in the two sectors [69]. Regardless, it is quite safe to conclude that important differences between organizations in the two different sectors exist.

None of the cases were studied through all the stages, and hence none of them had the ability to provide a complete understanding. During my study of the the first case I missed the opportunity to follow the project during the development phase, which could have provided a more complete understanding. In the same manner, for the last study I was unable to supplement my understanding with opinions on the final outcome, which in the end may be considered quite important.

The study could have benefited from an extension of the number of cases studied for comparison. The qualitative approach does not constrain the researcher to one single case without possibilities for comparison. However, the case studies conducted were quite demanding in terms of time, and an expansion could have been at the expense of the understanding of each case.

3.2.2 Collecting Data

In this section, the data collection process of both cases is presented. However, the actual results will be described in the next chapter (Chapter 4).

Case A

As the system(s) in the first case already were deployed some time ago, there was little daily activity in the project. Hence, document reviews and interviews were the only data collection methods available. Unfortunately, the county was not close by, and I had to travel for some time to get there. Thus, I scheduled one specific week in which I would conduct the study.

Document Review

Due to the change of project manager, getting hold of valuable documents was not straight forward. Altogether, I was given a document describing the system specification process, the project schedule and an overview of project goals and objectives. The system specification process and project schedule provided me with an overview of the project, however, they were not explicitly relevant to the purpose of the study.

Interviews

The stakeholders of interest were initially assumed to be:

- Project owner
- Project team
- Users
- Passengers
- Developers

However, through the interviews it became clear that there were few signs of an apparent project owner. The county's Department of Transport and Communications was officially the owner, but in all sense, other than receiving occasional reports from the project group, the department did not seem to be very involved. In addition, the development of the system was outsourced to an external system provider, which was positioned abroad. Hence, interviewing the developers, or anyone else directly included in the development process became impracticable. As a result, the stakeholder groups of interest were limited to; the project team, the users of the system(s), and the passengers.

The idea was to perform one-hour semi-structured interviews with selected members of the project team and some shorter interviews with representatives from the various user groups. An information letter (Appendix A.1) was prepared for the interviews, primarily in order to prepare the interviewee on practical details, and to inform about the confidentiality and the processing of personal data with respect to privacy. Printed and signed versions were given to the interviewees to ensure their comfort. The interviews were captured by notes and were supported by audio recording.

Unfortunately, my domain knowledge of public transportation where quite minimal in advance, and the design of the interviews had to be shaped continuously as I obtained

a better understanding. In light of this, not everything was possible to account for when planning, and it was critical to adapt accordingly. The guides to the interviews (Appendix A.2) had to be formed on basis of documents and information gathered through the former interviews, as was the case for the selection of interviewees. It seemed important to mask the real objective of the interviews from the interviewee to prevent them from answering what they thought to be the right answer. Hence, a vast part of the interview was dedicated to a general understanding of the project, rather than explicitly targeting the research questions. In addition, in qualitative research, the whole picture contributes towards the final understanding / interpretation. Thus, spending time on general questions were considered time well spent.

Furthermore, to gain a brief understanding of the passengers' experience of the project outcome, I wanted to conduct very short structured interviews with people while they were waiting for the bus.

The Project Team

The study started out with a two-hour semi-structured interview with who was assumed to be the project manager. This interview was supposed to provide an overview of the project and the ending system, and at the same time identify the practices of the project team. The interview guide for the project manager is attached in Appendix A.2 ("*Intervjuguide - prosjektleder*"). The main topics of the interview therefore included:

- Personal introduction - To understand the personal background and establish an atmosphere of trust
- The Project - To understand the project everyday, including outstanding challenges
- The System - To identify users to be interviewed later
- Evaluation - Both evaluation practices and personal opinions on success criteria

The current project manager was not the first, due to the structural organizational changes, and could correspondingly only provide insight to the last part of the project, in addition to documents that had been passed on to her. The interview provided valuable information, including an overview of the project group. The project group originally consisted of 4 people, of which two of the members had been brought in from one of the major external operators due to extensive experience with electronic ticketing. One of them was responsible for user involvement and user representation, while the other one provided insight to various IT aspects. The representatives both had extensive experience as bus drivers, which was where they originally had started out. The last member of the project team was representing the system provider. Later on, the team was extended with a person responsible for user training.

The two members from the external operator were selected for further interviews. Their interviews focused on giving an overview of their opinion of the process, primarily to build a more complete understanding, but also to create an opportunity for comparison. The interview guide for the project team is attached in Appendix A.2 ("*Intervjuguide - prosjektgruppen*"). The main topics of these interviews included:

- Personal introduction - To understand the personal background

- The Project - To improve the understanding of the project, including user involvement
- Evaluation - Both evaluation practices and personal opinions on success criteria

The Users

The system was to be used by people in all the various external operators, and this was where I would find most of the users. In fact, it turned out from the former interviews that one of the major external operators actually was the owner of the former ticketing solution that had been used in the county. Hence, this operator possessed valuable experience with such systems. In addition, some of the minor external operators did not use all of the system modules themselves. Hence, this major operator seemed altogether an obviously preferable choice. A group of users were invited to a short twenty-minute interview. In total, 6 users were interviewed, three of which represented bus drivers, one responsible for driver management and transaction inspection, and one from the accounting department. These interviews focused on how they were included in the project, their perception of project goals, how the project had changed their everyday, and how they would evaluate the project. The interview guide for the users is attached in Appendix A.2 ("*Intervjuguide - brukere*"). The main topics of their interviews included:

- Personal introduction - To understand the personal background in the company
- The Project - To understand how they had been included in the project, and how the projects had changed their everyday
- Evaluation - To improve the understanding of evaluation practices and personal opinions on success criteria

Some of the interviewees had a lot of opinions and experiences, and did not seem to be bothered by spending some time. As a result, the length of the interviews varied from 15-50 minutes. For most of the user groups there were only a few relevant people to question, and the selection was therefore close to predetermined. The drivers were selected by one from the middle management who knew their schedule, and the interviews took place in regular hours next to their cafeteria so that their wasting of time would be minimal. All of the drivers interviewed were men, and had over 20 years of experience as drivers. Some of them also possessed additional personnel responsibilities.

The Passengers

When planning the study, it was assumed that the passengers interacted with the system through some sort of ticket vending machine. However, this was not the case, as the customers bought tickets through sales offices or directly at the bus. As a result, the passengers themselves did not interact directly with the system, and since an electronic ticketing solution already existed, their everyday was assumed not to have changed remarkably. Nevertheless, I wanted to extend my understanding of the project with the opinions of the passengers. Hence, a superficial study of passengers was conducted. The strategy was to approach the passengers with semi-structured interviews through short conversations. However, I quickly discovered that the passengers had few opinions, and that short two-minute structured interviews seemed more effective. In total, 15 people were interviewed. It was a sound mix of men and women, all ages were fairly represented

(youth, adults, and seniors), customers from all product categories seemed to be represented (youth cards, value cards, season tickets, and single tickets). Even non-Norwegian speaking passengers were included. The sample was randomly selected from the people available at the bus stop. However, it should also be mentioned that a lot of people declined to participate.

Case B

As opposed to the first case, all of these projects were still ongoing at the time of the study, and no functionality had actually been deployed yet. Hence, the study was limited to the users' preliminary experiences with the process of requirement analysis³ (i.e. the requirements specification process), and expectations to the ending outcome, rather than experiences with an actual system. On the other hand, the fact that the projects were still ongoing allowed me to extend the study to include some observation as well.

In the same way as with the first case, this agency was not close by. Hence, I had to schedule the study in advance. The original plan included three sessions as shown in Table 3.3, in which each session would last for 1-2 weeks. In addition, I planned to participate as an observer at anything of interest that would happen during these sessions.

However, it quickly became clear that people of value rarely had the opportunity the same period of time. Correspondingly, I ended up splitting the study into five sessions over a period of three months. In addition, the structure that I once had planned became almost neglectable, except for the first presentations.

Session	Purpose
1	Introductory presentations to get an overview of the project
2	Interview members from the different project teams
3	Interview users and other stakeholders involved

Table 3.3: Case B: Originally planned sessions of the study

Document Review

Unlike case A, I quickly got hold of a large number of relevant documents. The program and each of the projects had their own mandate, specifying goals and objectives, roles and responsibilities and plans for execution. In addition, the project mandates specified plans for both quantifiable and non-quantifiable benefits realization, as well as a risk analysis. Furthermore, I got access to project plans and descriptions of system architecture.

Interviews

Altogether, eight interviews were conducted. Four of these were with those responsible for the process of identifying needs (i.e. requirements) in each project, which were the

³The process is about determining needs, or "gaps" between the current and the desired situation. The ending result of this process is often a specification of requirements

respective project owners. One interview was dedicated to one person responsible for documenting this process across projects. The purpose was to create a framework which could provide a standardized methodology for this process in future projects. The remaining three interviews were with users that had been interviewed and participated in workshops as part of this requirements specification process through the *Analysis and Reporting* project.

As it would highly benefit the diversity of data for the analysis, I made an effort to get interviews with users and stakeholders that had participated in the other projects as well. Unfortunately, all of the people that had been involved in these projects were from external partners. Hence, contacting them was not straight forward. Permissions were required before I was allowed contact any of them, and when I was allowed to make contact none of them responded to the requests. Hence, I concluded to focus the efforts elsewhere.

From the first case I learned that audio recording complicated the interviews, and that transcribing them afterwards took huge amounts of time. In addition, I got the impression that the interviewees felt constrained by the recording. Hence, I decided to rely entirely on notes during these interviews. In fact, during the interviews I recognized that the short breaks that sometimes occurred between questions due to note-taking, allowed the interviewees to think for some seconds and quite often follow up with extended answers. I developed interview guides for all of the interviews with cleared space for note-taking, ranging from 2-4 pages. However, during the interviews I learned that the cleared spaces were insufficient, and the notes from each interview ended up at lengths around 4 pages. In short time after the interviews I went over the notes to see if everything made sense in aftermath. Some researchers review their notes and structure them further by using annotations or similar instruments, however my notes seemed to be fairly structured due to the guides, and I considered this structure to be sufficient.

As the previous case had been mainly focused on project objectives, evaluation of the outcome and outcome satisfaction, and as the time available for interviews was fairly constrained, the focus of these interviews became the process of involving users and other stakeholders.

Project Owners

The interviews with the project owners were 60-90 minutes semi-structured interviews. These interviews were aimed at understanding how they had conducted their process of identifying requirements, and what they had done differently. In addition, I wanted to understand what each of them had perceived as their major challenges with this process. The interview guide for the project owners is attached in Appendix B.2 ("*Intervjuguide - Behovskartlegging*"). The main topics of their interviews included:

- Project Introduction - Understanding how they had been introduced to the project, and to establish a common frame of reference.
- Requirement Analysis - To understand how they had involved the users and other stakeholders in the process of identifying needs.
- Stakeholder Involvement - Improve the understanding of how they were selected, detect any prioritizing of specific groups, and how these stakeholders had been followed up in the aftermath.

As with the interviews from the first case I attempted to mask the real objective from the interviewees, and spend some time on general questions.

Users and other stakeholders

The interviews with the stakeholders involved in the *Analysis and Reporting* project were 15-20 minutes structured interviews. The rationale for selecting structured interviews as opposed to semi-structured was grounded on the prediction that these interviewees had less to share, which would create a need for a more strict agenda. The interviewees belonged to various stakeholder groups, and as they were spread all over the country, the interviews had to be conducted over telephone. Each of them received an information letter (Appendix B.1) in advance. The purpose of these interviews was mainly to investigate how each of them had experienced their own involvement, but also to understand their criteria for project success. The interview guide for the project owners is attached in Appendix B.2 ("*Intervjuguide - Brukere*"). The main topics of their interviews included:

- Project involvement - Investigate how they perceived their own involvement. Thoughts on follow-up and any demonstrations or presentations they had attended.
- Evaluation - Understand their perception of success and expectations to the outcome.

As no system(s) had been deployed, opinions of users and stakeholders that had not been involved in the needs identification process were limited to the fact that they had not been involved. Hence, I predicted that such interviews would be demanding without giving that much in return, and concluded to exclude it from the study.

Observation

During the sessions I also attended various meetings and presentations to get a deeper understanding of the practices. All projects practiced *scrum*, an agile software development framework. Hence, I attended a sprint review meeting in the *Analysis and Reporting* project, and the corresponding sprint retrospective. I also attended a presentation of the functionality that had been developed during this particular sprint, however none of the users / stakeholders showed up, and the presentation was canceled. In addition, I attended a joint presentation of the results of the entire program at that point, open to the whole agency including all regional offices and branches over teleconference.

At the outset of the study I also hoped to be able to participate as an observer to some parts of their needs identification process, but unfortunately all of the projects had completed this process already.

Seminars

During the second case study I attended two seminars arranged by Difi⁴. The first seminar was a whole-day presentation and course in a project model to be used by organizations in the public sector called "*Prosjektveiviseren*"⁵, while the second was a

⁴Difi: Agency for Public Management and eGovernment (Difi) aims to strengthen the government's work in renewing the Norwegian public sector and improve the organisation and efficiency of government administration. - www.difi.no, 01.06.2013

⁵Prosjektveiviseren: <http://www.prosjektveiviseren.no>

two-hour lunch seminar on a newly published public report on the success criteria of digital change projects created by a research group within Difi. Both of these seminars were attended in an attempt to capture additional input on the challenges organizations face in practice, and also improve my understanding of how success criteria are perceived in practice. During the seminars I attended discussions like the other participants, but made an effort to maintain my role as an observer. Hence, I made no attempt to turn the discussions towards areas of my interest.

3.3 Method Evaluation

Klein & Myers (1999) propose a set of seven principles for conducting and evaluating interpretive field studies on information systems [70]. They emphasize that the scope of their paper is limited to interpretive field studies, but states that their evaluation criteria apply to both case studies and ethnographies, as long as the underlying philosophy is interpretive. Hence, I feel confident that these principles may be applied to this study as well, even though it is stated that their principles apply mostly to research of an hermeneutic nature. In addition, Myers and Newman (2006) examine the state of the art of qualitative interviews, summarizing problems and pitfalls of such interviews into specific *guidelines* [71]. Together, these papers form the basis for this evaluation of the method.

First of all, it is important to recognize that the data used in this interpretive study is mainly collected through the interaction between the researcher and the subjects. Most of the interviewees had no prior knowledge of me, and their reasons for trusting me was therefore completely relying on the credibility of the information letters. During the second case study it became clear to me that the purpose of my involvement had not been sufficiently clarified. One of the project owners told me she was under the impression that I had been interviewing them in an effort to determine whether their projects was a success or not. Hence, some of them may have thought of me as an inspector, and thus questioned my integrity. Due to this potential lack of trust, their answers may correspondingly have been biased. Some may for instance have refused from revealing their real opinions, to ensure themselves from any undesired effects. In addition, as people usually want to appear knowledgeable, the interviewees' answers may have been constructed to sound logical and consistent. Beware of this I made an effort to minimize formalities and make them feel comfortable. Furthermore, language always embed some degree of ambiguity, and because of the need to appear knowledgeable, interviewees may pretend to understand questions including terms that they actually did not recognize. Likewise, what appears to be the same question, may be interpreted multiple different ways, depending on the receiver. In addition, one needs to remember that even if the answers actually were honest, no human memory is perfect. For Case A, some time had passed since the system was deployed, and the actual perceptions may have been influenced by others through discussions and conversations. For Case B, numerous interviewees specifically had to focus for a short pause of reflection to recall details. Hence, the interviewees may even simply have recalled certain aspects incorrectly.

Moreover, the sample of participants were in both cases selected explicitly by their

managers or the ones responsible for their involvement, or because their name came up during discussion in other interviews. Hence, an overweight of the data may have come from well-informed, *high-status* informants. Correspondingly, data from less articulate, *lower-status* informants may have been poorly represented. Such lower-status informants may have totally different perceptions than the high-status informants, and their opinions should have been equally appreciated. In the same way, the drivers from case A should have been a more even distribution of experienced and novice drivers, representing both male and female drivers.

Lastly, the structure of interviews was inevitably to some extent influenced by preexisting perceptions. Thus, the questions may unconsciously have been designed to fit hypotheses and theories.

4

Findings

This chapter presents the findings of the data collection process described in section 3.2.2. These findings will then be discussed in next chapter, the light of the background provided earlier.

4.1 Case A

4.1.1 Project Objectives

Actual Objectives

The objectives for case A were specified in an eleven slides (i.e. pages) long presentation, dated September 21, 2007. One of the most interesting observations related to the project objectives, was that 8 out of 11 pages was a word for word exact copy of the general objectives of electronic ticketing as defined by the *Norwegian Public Roads Administration*¹ [72]. Two of the remaining pages described general objectives and requirements of electronic ticketing, while the last page contained five bullet points of objectives specifically targeting the project. Altogether, 5 out of 61 stated objectives were clearly linked to the purpose of the project, as opposed to electronic ticketing in general. An exact overview of how the objectives were differently focused is shown in Table 4.1

The project goals were specifically:

- Implement a complete ticketing system on time, fully operational no later than April 1, 2007
- Deliver the system within the budgeted cost limits
- The project should deliver optimal functionality to all future users of the system
- The project should ensure best possible flow of information to all those involved with the ticketing system
- The project should increase overall expertise on electronic ticketing for all involved participants

¹Also known as "Statens Vegvesen", <http://www.vegvesen.no/en/Home>

# of Objectives	Focus / Perspective
7	The customer
14	The operators
8	The government and authorities
5	Coordination of national electronic ticketing
4	Purpose of electronic ticketing
8	Requirements to electronic ticketing
5	This specific project

Table 4.1: Case A: The focus of objectives

With respect to these objectives, it is worth commenting that the stated deadline (April 1, 2007), is prior to the stated date of the objectives document. Additionally, as the system was deployed in April 2011, there is no doubt that they failed to achieve that particular objective. Also worth mentioning, is the fact that some objectives were stated multiple times (e.g. "Electronic ticketing must have a high degree of certainty"), and that a large part of the goals were vague, unclear and hard to measure. Examples of measures that might be considered hard to measure are; "It should be simple to use public transportation", "Simplified ticket inspection" and "Increase the number of travelers".

Perceived Objectives

Trying to understand the different stakeholders' perceptions of the project objectives produced some interesting discoveries. First of all, it was no universal conception of objectives. Several of the people interviewed stated that they believed the project goals were to improve and simplify the passenger experience. This was specifically the case for the stakeholders outside the project team, of which 4 out of 5 explicitly stated simplification as what they thought to be one of the major goals. Some of these stated that the simplification also included the process of driver settlement. In addition, increased flexibility and efficiency was mentioned by a few, while one of the interviewees stated that the new system was supposed to be "*better*" and "*newer*".

Surprisingly, the perceptions of the objectives within the project team were also fairly inconsistent. One of the project team members stated that the main purpose of the project was to comply with the specific set of standards defined by the Department of Transportation and Communications in "Handbook 206", as mentioned earlier. However, this was not even mentioned by any of the other team members, neither by any of the other stakeholders. Another team member claimed that the main purpose was to be able to solve tasks that could not be solved in the previous system, that it was important for them to be able to do some programming themselves, and that the mobile systems in the buses were updated automatically and wirelessly.

Altogether, none of the people interviewed seemed to have a clear and complete overview of the project goals. It should be noted, however, that this might be expected, at least when recognizing that more than 18 months had passed since the system was deployed. Nevertheless, it was also quite surprising to notice that some of the specified project goals specifically involved stakeholders that we had interviewed, and that these stakeholders themselves seemed to have no knowledge about those goals. An example

would be "The goal of electronic ticketing is to streamline collecting, accounting and monitoring of ticket sales", of which the representative from the accounting department had no knowledge.

Communication of Objectives

Some of the stakeholders outside the project team reported that they had been provided with documents specifying the project goals, while others claimed they had never seen or heard anything related to objectives. A few even stated that they believed their main source of information about the project was what they heard from others, and that they had received no official information about the project goals at all. Altogether, it was the most common opinion that the focus on project objectives had been minimal, and that the communication of these objectives outside the project team had been non-existent. The fact that they all reported quite different objectives, even within the project team, and that none of them actually seemed to have a complete overview of the objectives, supports this theory.

4.1.2 User Involvement

Project Methodology

To understand how users had been involved, it seemed important to understand how the project team had been working throughout the project. Due to the outsourcing of the development, the project actually had two distinct project teams, as shown in Figure 4.1.

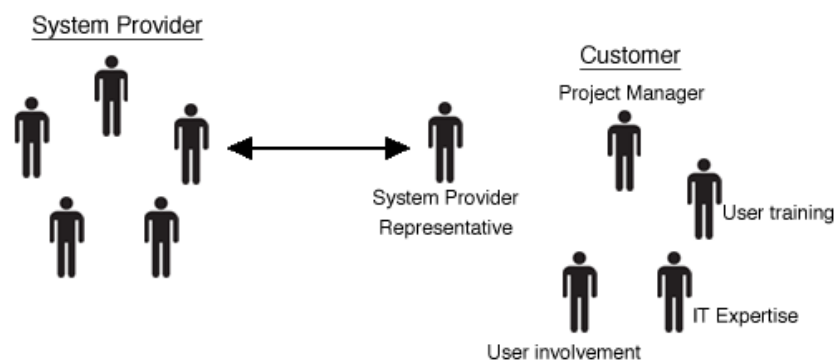


Figure 4.1: Case A: Overview of the project teams

The system provider had their own project team, and the communication between the two teams was handled by a system provider representative that was part of the customer project team. However, as the system provider team was positioned abroad, the developers were not included in this study. The ending system was a customized version of an already existing product from the provider. Hence, the requirements specification was defined in terms of "gaps" between the already existing solution and the desirable result.

Altogether, it seemed like the methodology was largely decided by the system provider, as the customer did not have their own methodology. In all sense, the method-

ology seemed like pure waterfall. The project was roughly divided into three phases. The first phase consisted of three main tasks; hardware ordering, gap identification workshops, and a gap analysis finalization. This phase ended with a formal approval of the selected change proposals. The second phase contained eight main tasks; hardware delivery, software development, factory acceptance testing (FAT), software rework, installation, software acceptance testing (SAT), rollout, documentation, and training. The last phase was the operational phase, also known as the warranty phase. The customer project team had conducted weekly or biweekly meetings throughout the project, in which they informed about progress and discussed any problems and challenges that had occurred.

User Involvement

From the Project Team Perspective

One of the project members had been involved from the major external operator as part of the project team explicitly to be responsible for handling the users. In order to identify requirements for the new solution, they had for some time gathered a variety of operators regularly throughout the country to what they called "user meetings". At these meetings they discussed best practices and attempted to reach consensus on requirements. The motivation was that several of these operators were at the time acquiring the same system. Hence, they created an arena to exchange knowledge. In addition, trade unions had been involved, representing the bus driver as a user group, both prior to and during the development. Lastly, they claimed that different stakeholders had been involved in different phases of the process, either when they wanted to gather input on experiences with the current system or suggestions for the new systems. Altogether, the project team seemed satisfied with their effort to involve users, and confident that their user involvement had been sufficient. One of the project team members explicitly expressed confidence regarding proper involvement of bus drivers.

With that being said, it did not seem like the project team had a common definition of stakeholder priorities. When they were asked whether their prioritization of the different stakeholders was intentional, they all agreed that the priorities had been rather arbitrary. One of them even retrospectively revealed that one of the stakeholder groups probably had been given too low priority. This indicated actual differences in priority of the different stakeholder groups, even though they were not decided explicitly. Another example would be the passengers, which seemed have been completely left out, despite being considered an important stakeholder if we are to consider the stated objectives.

From the User Perspective

Interestingly, most of the people interviewed claimed that they wanted to be more deeply involved than they had been. One explained that they felt their involvement had declined heavily over the time of the project, while another felt they were included way too late. Within the group of drivers, there seemed to be a common opinion that there had been few opportunities to contribute with experiences and thoughts, both before and under the development. They seemed to agree that little effort and initiative had been made from the project group to collect their opinions. One of the drivers complained about the

team's lack of self-awareness, and made references to their outdated experiences. When referencing the project team members, he specifically stated that:

- *"Those ancient guys over there don't know anything about driving bus"*

He also indicated that this was something he had discussed with other drivers as well.

Training

Even though user training was not explicitly related to our research questions, it became an interesting topic in many of the interviews, and actually seemed to be a large part of the stakeholders' idea of involvement. One of the drivers claimed that he had received practically no information about the system prior to the training, and that his first real introduction actually was through the user manual. Several drivers stated that there had been little involvement prior to the training, and that this was their first opportunity to contribute with feedback. However, it was added that this was too late, as only some simple issues had been corrected, while the more challenging and fundamental ones had been left out.

The project team seemed to express confidence in that they had adequately facilitated user training. The drivers on the other hand, were split into different views, even though they agreed on the actual amount of training provided. The drivers had been paid for a couple of hours of training, but multiple ticket machines had been left available afterwards to those that felt the need for more. A group of experienced drivers had been selected as superusers, and were supposed to facilitate the other drivers during their training. Some of the drivers were satisfied, and emphasized that the new system, in many ways, was quite similar to the previous system, which had eased their transition. However, one of the drivers expressed remarkable dissatisfaction with the extensiveness of the training. He claimed that the training had been too short, and that one could not expect people to practice outside work hours, even though they were given the opportunity. This was backed up by similar comments from others. The same driver also commented that it was difficult to produce all the challenging cases that could happen in practice, and hence indicated that the training was pointless.

The other stakeholders on the other hand, apparently seemed to be satisfied. Some even specified that they had been able to ask for assistance later on, if there were something they had failed to understand or forgotten since the training.

Stakeholder Satisfaction

Routines

The impressions from the interviewees indicated a smooth transition, with no major problems in the transition phase.

The bus drivers reported some changes to their everyday due to the new system, even though they already were used to electronic ticketing systems. The drivers reported the swiping of cards as a remarkable efficiency increase when loading passengers. Automatic GPS tracking was also reported as an improvement. However, all of the drivers reported

that the steps to select the passengers' end zones when selling tickets had become much more cumbersome. They stated that the former machines had a list of zone numbers, but that they now had to remember all the numbers. In addition, some of them reported that certain updates of ticket cards demanded numerous keystrokes, and considered it an efficiency-constraint.

The drivers reported inconsistent perceptions of how the changes of the new settlement routine had affected their everyday. Some of the drivers expressed great dissatisfaction with the new solution, claiming that the new routines demanded unnecessary and time consuming work. On the other hand, others reported that the new settlement routines were much simpler and less time consuming.

Interestingly, the passengers seemed to be either unaware of the introduction of the new ticketing system, or satisfied with the results. Only a few of them complained, and it was all about the same product (prepaid cards). Earlier, the passengers had received a receipt when swiping their cards, providing them with information about their current balance. With the new system, no receipt was printed, and the passengers claimed that it was difficult to see their balance on the screen. With that being said, some of the other passengers stated that they were very pleased that they no longer had to take "that stupid receipt". In addition, it is worth mentioning that none of the passengers reported any problems with the transition to the new system.

Systematic Evaluation

The interviewees were asked whether there had been any sort of organized evaluation of the project. One of the team members claimed that the drivers had answered a questionnaire, however, none of the other team members, nor the drivers themselves, confirmed this. All of the other interviewees stated that no evaluation had been organized. The project team did not seem to have discussed making evaluations, and naturally did not have an explanation of why it had been left out. One of the drivers added that there had been some discussions between the team leaders, but that such meetings only had been related to solving specific problems, rather than evaluating the project as a whole. The other users reported very similar experiences. None of the users outside the project team felt that they had been sought in an attempt to collect feedback.

The Underlying Criteria

The level of stakeholder satisfaction was very inconsistent. The evaluations were quite fairly distributed from total failure to complete success. However, in general the project team seemed to be more satisfied with the outcome than the rest of the stakeholders.

Correspondingly, they all reported different criteria for their evaluation, but there were some common factors; Each and every one of the stakeholders outside the project team seemed to evaluate the outcome based on the changes to their everyday. Most of them seemed to use the amount of problems they had experienced themselves as their criterion, while a few assessed the outcome based on their expectations to the system. Accordingly, those who had experienced any problems themselves, were least satisfied with the outcome. One of the interviewees based his evaluation by recalling how things were when he originally started out driving bus, approximately 30 years ago, while another

one emphasized his own contribution when assessing project success. Interestingly, one of the drivers stated that the project was a failure, even though he altogether seemed to be satisfied with the outcome, and the changes to his everyday. He even stated about the system that:

- *"All in all, it's actually fairly good"*

It seemed like his frustration was based on his perception that the drivers themselves had not been asked to share from their experience, and hence that he was unhappy about the process, rather than the outcome.

Altogether, the project manager was the only one who seemed to evaluate the project from a fairly objective reference point, as the rest of them were apparently looking at the outcome entirely from their own perspective. However, *none* of them even considered the project goals, or what they believed to be the project goals, when assessing the outcome, not even the project manager.

4.2 Case B

4.2.1 Project Objectives

Program Objectives

As opposed to the first case, the objectives of the program and the individual projects were stated clearly. The agency had taken concrete steps in order to position their projects ahead of sudden needs for upgrades to their IS portfolio, which earlier had been the main driver for new IT projects. One of these steps had been to establish the pilot program, that later led to the modernization program, in which they systematically investigated where improvements would best benefit the organization.

The main objectives of the program were to modernize the organization's application portfolio, and ensure appropriate progress of the projects included as part of this modernization. However, the program also aimed towards increased internal human resource development within the agency, and to establish a common framework in order to obtain sustained improvement of their project implementation quality.

Project Objectives

All *project mandates* included a list of project objectives, divided into two clearly distinct categories describing the objectives at different levels. The first set of objectives described the desired long-term effects of the project, both organizational and social, while the second described the desired specific results that were assumed to produce these effects. The objectives that referred to desired effects were in general less measurable than objectives specifying the actual outcome, which were really precise.

Benefits realization

However, in addition to these two sets of objectives, each mandate specified both quantifiable and non-quantifiable benefits or gains that one should expect to be able to extract

from the project outcome. With that being said, the actual differences between the objectives and expected benefits were unclear from the mandate. As with objectives, benefits also included society and end users outside the agency.

4.2.2 User Involvement

Project Methodology

As opposed to the first case, all of these projects were implemented *in-house*. Hence, the gap between the project teams and the developers was significantly reduced in comparison with the first case. The composition of the project teams is shown in Figure 4.2.

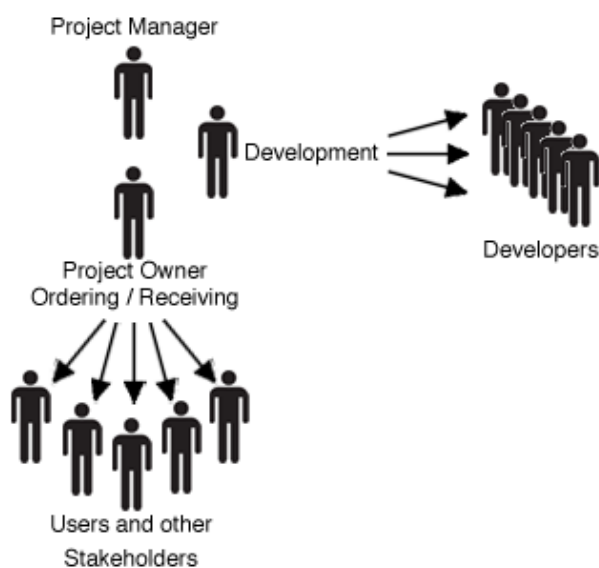


Figure 4.2: Case B: Overview of the project teams

Each project had at least a project manager, a project owner responsible for ordering and receiving the system, and someone responsible for the development team(s). Some projects had more than one project owner engaged in different parts of the deliveries, or multiple development managers due to multiple development teams collaborating on the deliveries. In addition, as all projects were practicing scrum, the project team, including the developers, would meet for standup every day. Hence, the developers may be considered part of the project team as well.

As part of the framework aimed at contributing towards sustained improvement of project implementation quality, the agency had established a common project model to be used in their projects. The model was based on a public model created by the Norwegian Agency for Public Management and eGovernment (Difi) called *Prosjektveiviseren*, however tailored to fit the organization's needs more properly. Hence, all the projects followed this model. Members of the program management emphasized that establishing their own model had been a deliberate choice to avoid becoming deeply invested into project models of an external part (e.g. a supplier).

User Involvement

In the same manner as with the project model, the agency had established a framework for the requirements analysis and specification process. However, the agency recognized that they did not possess such knowledge internally, and had decided to hire a consultant to assist them. An interesting detail of this observation, was that instead of hiring consultants to conduct the requirements analysis themselves, they employed the consultant to assist them in creating the framework and in utilizing the framework afterwards. Hence, instead of purely receiving a requirement specification, the agency also increased their competency in accordance with their goal of sustained improvement of project implementation quality.

From the Project Team Perspective

The requirements analysis Process

The project owners represented the customers in the project teams, and were additionally the ones responsible for the requirements analysis. The whole process from identifying needs to a finished requirement specification roughly included four steps. To identify relevant needs, the project owners conducted interviews with selected stakeholders (1). Then, the feedback from these interviews was analyzed, resulting in a set of *user stories* (2). These stories were then presented, discussed, and prioritized through two subsequent workshops with the stakeholders involved in the interviews, and some developers (3). Finally, a requirement specification was established (4).

This process seemed to be fairly equal in the different projects. The project owners all reported that the consultant had participated in the first interviews to get them going, and that he later had assisted them in conducting the workshops, before they had completed the requirement specification. Interestingly, the project owners did not possess any prior knowledge about software implementation nor requirement specification, but rather extensive domain knowledge. However, every one of them emphasized that they considered the process quite straightforward to master, despite their lack of prior knowledge. With that being said, several of them appraised the experience and participation of the hired consultant to be crucial to the success of the process. Additionally, it was stated that the framework was not meant for everyone to use; some prior knowledge was required to make use of it.

One of the project owners stated that the main challenge with the requirements analysis process was to derive a comprehensive interview guide that would contain the correct answers, and emphasized how domain knowledge was crucial in this matter. She specified that certain aspects had remained unaddressed during the interviews due to their lack of knowledge regarding such aspects when developing the questions and guides. At the same time, very similar guides had been utilized for interviews with the different stakeholder groups, which had resulted in quite general questions.

The prioritization of the different stakeholder groups was according to all project owners highly intentional. Based on findings from the pilot project, stakeholder groups that seemed to be of interest were given priority. However, the actual choice of interview

wees within each stakeholder group seemed to be rather arbitrary. Several of the project owners admitted that they had chosen stakeholders close by to limit the time spent. They emphasized that resources (e.g. time) were limited, and that they had to make a choice, as including all users would be impractical or impossible. It was noted that a lot of common sense was applied to select the appropriate stakeholders for involvement.

The Development Process

The responsibilities of the project owners did not end with the requirement specification. It was the project owners' responsibility to represent the customer in the scrum team throughout the development process. Hence, the project owners needed to prioritize requirements in cases where multiple requirements conflicted or when a choice had to be made between various requirements because of time constraints. These priorities had to be based on the requirements analysis process just described, and a lot of the priorities made during the sprint planning meeting seemed to be based on mere guesses.

As opposed to the requirements analysis and specification process, the responsibilities through the development process generally seemed more troublesome for the project owners. During the sprint planning meeting, it was evident that a lot of time went by in an effort to clarify *user stories* that appeared to be ambiguous to the developers. One of the project owners specifically stated that one of the main challenges related to her responsibilities was her lack of ability to understand the technical aspects of the user stories, and as such, that she had no understanding of why certain tasks took such amounts of time. She claimed that identifying the technical aspects of the user stories had been one of the main reasons for involving developers at the last workshops, and hence that this certainly had failed. She stated that the purpose of these workshops had been to transform user stories more towards technical requirements, and emphasized that it all was very confusing to her. She had the impression from the developers that they had not seen the value of being present during these workshops, due to the general lack of focus on the technical aspects. Altogether, she was under the impression that the developers in general paid too little attention to the user stories.

In addition, incorrect estimates created huge differences between estimated hours and actual hours spent on a task. One of the project owners suggested that the incorrect estimates often were related to such unforeseen technological challenges, and that these challenges were what the developers invested most of their time in solving. During the sprint review meeting on the other hand, it became evident that unexpected complications due to new technology were one of the main reasons for underestimates. Hence, whether the developers' ignorance during the specification process, or simply their lack of expertise on new technology, caused the underestimates, was unclear.

From the User Perspective

Since no systems had actually been deployed yet, the feedback from the users involved was entirely based on their experiences with the involvement in the process.

All the users indicated that they were left with a positive perception of their involvement. One also commented that she thought the process had been both neat and orderly, while another stated pride in that their opinions had been taken seriously. They

all seemed to be relieved that they finally had been able to contribute with feedback that they had been thinking on for quite some time. Altogether, the users seemed very satisfied with their involvement. However, none of them felt that they had been encouraged to make an effort to represent the opinions of the remaining stakeholders in their group, but rather focus on their own conceptions.

Stakeholder Satisfaction

The users all indicated that the communication of the appropriate success criteria had been absent so far, and some specified that it had been left to their own initiative if they wanted to become familiar with such definitions.

The Underlying Criteria

In the same way as with the first case, the stakeholders' criteria for success were highly affected by their own jobs. Each and every one of them reported that their criteria for success were related to the improvement of their everyday. However, one of the users interviewed from the financial department also reported that she really hoped the projects would stay within the budgeted costs.

Worth mentioning is the observation that the users without doubt expected that all the functionality they had requested, would be implemented. Hence, there seemed to be little understanding within the group of users that time or cost constraints would prevent the project team from delivering all requirements. One of the users actually stated that:

- *"I am certain that we will succeed in delivering these requirements."*

5

Discussion

This chapter is an effort to concisely discuss the findings of relevance from the previous chapter in the light of the background provided in Chapter 2, with respect to the research questions in Section 1.2.2.

5.1 Success Criteria Revisited

5.1.1 The Traditional Measures

Early literature and practices considered time, scope, and cost to be the most appropriate measures for project success. However, recent literature has focused increasingly on the importance of *effectiveness measures* as opposed to these traditional *efficiency measures*. Effectiveness measures are often harder to measure and less quantifiable, like stakeholder satisfaction. The minimal emphasis on these traditional measures is supported by the observations made during this study.

Time altogether seems to be fairly irrelevant to the evaluations of project success made by various stakeholders. The first case required twice as much time as was originally planned in order to be completed, and was deployed in 2011 as opposed to 2009. However, none of the stakeholders even mentioned this when specifying what criteria they considered basis for their evaluation. As for the second case, none of the stakeholders interviewed seemed to emphasize on time constraints. With that being said, several of the interviewees for case A specified during conversation that the functionality delivered already was fairly outdated compared to public transportation services in other counties. Hence, despite the irrelevance of the time constraints to the perceived success, the overall timing of the delivered functionality seemed to be of significance.

Scope has also been considered one of the traditional measures for success. However, as scope changes are actually encouraged during agile development, and as *scope creep*¹ by definition can not exist in agile projects (ref: Agile manifesto [73]), scope can not be considered when success is measured in agile projects.

¹Uncontrolled changes or continuous growth in a project's scope

Cost on the other hand, seemed to be considered important. It was never mentioned by the interviewees of the first case, but was emphasized as critical by one of the interviewees of the second case.

Altogether, these findings are consistent with the literature claiming that projects have been considered successful despite overruns of these traditional criteria [14].

However, the report on success criteria in digital change projects published by Difi earlier this year, specifically considered successful projects to be those that had delivered within time and cost constraints, and with sufficient quality. Hence, it is evident that some still seem to follow this traditional definition of success.

Literature has claimed that there is a need to separate project success from project management success, in which project success have been defined by these traditional criteria. This would in many ways be the equivalent of separating process success from product success. However, during the first case study it was evident that some of the interviewed users apparently were satisfied with the outcome of the project, while disappointed with the process due to their lack of opportunities to contribute with their own valuable experiences, and then ended up considering the whole project as a complete failure. Hence, this study suggests that one should be careful when considering separation of project management success from project success.

5.1.2 Project Objectives

In both cases, there were a large number of objectives. Measuring the achievement of each of these objectives would therefore in both cases require an extensive number of different measures, which in the end be unfeasible in practice. Thus, one would either need to find some other way to measure the achievement of objectives, or conclude that project objectives simply does not qualify as an appropriate selection of criteria when measuring the success of an outcome. Compared to the literature, this is quite consistent with the work of de Wit (1988), who stated that problems arise when one attempts to list the objectives and discovers that there are quite a few more objectives than expected, and that these objectives often are structured into a complex hierarchy of stakeholders and project phases [32]. Hence, he claimed that believing in that one could possibly measure the success of a project objectively is somewhat an illusion [32].

Nevertheless, the cases studied illustrated what seems to be some positive properties of project objectives. As opposed to success criteria, stakeholders did not seem to consider project objectives entirely from their own perspective. Hence, project objectives, despite sometimes being impracticable as a selection of measures for evaluation of outcome, together with benefits realization plans or similar tools may provide a sound platform for an agreement on what a project is meant to achieve. Altogether, project objectives could serve as an agreed upon success criteria when the purpose is to manage and align stakeholders' expectations to the outcome.

However, some other weaknesses of project objectives were evident in the two cases studied. First of all, the project objectives were to a limited extent defined by the organizations themselves. In case A, the objectives were for the most part copied directly

from a public document on general objectives with electronic ticketing. In case B on the other hand, the project objectives were specified in mandates that had been written by consultants. Hence, the actual anchoring of the objectives in the organizations seemed unclear. Secondly, the quality of the objectives was very inconsistent. Some objectives were ambiguous in every aspect, while others were explicit and clear. Lastly, the general focus and attention on project objectives seemed quite minimal. None of the stakeholders seemed to consider project objectives as basis for their evaluation, and from case A it was clear that little communication of objectives had been present. Hence, if project objectives were to serve as a reference point of what a project is meant to achieve in the cases studied, the project teams would at least have to address these issues deliberately.

5.1.3 A Matter of Definition

No matter how one attempts to think about success, for all practical reasons, assessing and measuring the success of a project makes this assessment indistinguishable from *perceived success*. Success hence seems, in the end, a subjective concept no matter how one attempts to look at it. Correspondingly, it may be suggested that project objectives may serve as the agreed upon criteria between stakeholders, and that stakeholder satisfaction could be used when measuring the success of the outcome in the aftermath.

However, the findings of the case studies provided in this thesis indicate that finding one general selection of success criteria and success measures, even when considering dynamic selections, seems like an illusion. Both of the cases seemed unique in terms of strengths and weaknesses, and where some criteria were applicable, other criteria may not have been. Consequently, success in terms of criteria and measures seems to be a matter of definition, as recently suggested by Thomas and Fernández (2008) [16]. Hence, every project team should internally decide and agree on what they consider to be their success criteria. In addition, in cases where formal evaluation of outcomes is desirable, the project teams should agree on what measures they consider most appropriate.

Agreeing on success criteria may be very hard, as there undoubtedly will be conflicting interests between stakeholders [15]. There will inevitably be trade-offs [74], but these trade-offs must be agreed by all parties before the project is started [15]. Unless success criteria are understood and accepted by stakeholders there will be differences in expectations, and it will potentially be impossible to satisfy everyone. From the case studies it was evident that when success is not agreed upon, the stakeholders' perceptions of success were exclusively and highly dominated by how the project would affect themselves. Hence, regardless of how challenging it is to agree on the success criteria, it seems safe to claim that this is needed in order to align expectations.

5.2 User involvement

When studying literature on user involvement, one might easily be tempted to believe that those responsible for user involvement is largely a community of professionals, and that user involvement is part of their specialization. However, in both cases, the people

responsible for user involvement were not professionals. On the contrary, they were people with extensive domain knowledge. None of them had been involved with any requirement identification or specification process earlier, and had little or no experience with IT projects in general.

This is in alignment with the literature on agile development, in which the importance of skilled team members with solid domain knowledge has been emphasized; "without these kinds of persons, the chosen approach would probably have little possibility to succeed" [75]. Additionally, domain knowledge was pointed out by one of the interviewees in case B as what she considered to be most important in order to succeed with the process. In addition, all the interviewees in case B considered the process of requirements identification and specification quite trivial and easy to understand, further indicating that domain knowledge is more critical.

However, as domain knowledge often is what organizations naturally possess through their employees, knowledge about the process seems to be what they really lack. This idea seemed to be supported during the discussion groups attended, in which several participants expressed support to the public project model, but indicated that the real challenge was related to their ability to execute each of the steps described by the model, due to lack of internal skills and knowledge. The organizations studied approached this problem very differently. Case A relied on their own skills and conducted the requirements specification on their own. Case B, on the other hand, hired an external consultant in order to assist them in creating a company-wide methodology. This resulted in that the project team from the first case involved trade unions in an attempt to identify requirements and needs, whereas project teams in the second case deliberately involved selected users.

With that being said, the actual impacts of these quite different choices are unclear. During the first case study it became clear that several users were dissatisfied with the project due to their minimal involvement. However, users with minimal or practically no involvement existed in the projects of the second case study as well. The project owners acknowledged that they had deliberately selected users within each group, and that correspondingly some users had been excluded from participation. This is reasonable, as involving all users in most cases would not have been feasible due to time and resource constraints. However, this illustrates that several users never were involved directly in the process. These users were never interviewed as part of this study, but the project owners confirmed that little effort has been made to make sure that the requirements gathered from the selected participants corresponded to the needs of the user group as a whole. On the contrary, the focus had been on making sure the selected users felt confident enough to express their real needs, which seems reasonable.

Most literature seems to focus on the users that in some way have participated in the process, rather than those that have been involved to a lesser extent. However, in the end their satisfaction may be equally important to the satisfaction of those that have actively participated. The problems related to the needs of these users seem to be split into three main challenges. First of all, how do you select the appropriate users to involve? Secondly, how to ensure that the needs of those not involved are maintained in the same way as the people involved? Finally, how to make them understand that

one actually has attempted to consider their needs during the requirements specification process? Based on the results of the first case study one might question whether users who themselves feel that their involvement has been inadequate, seem more intolerant to errors than others. However, previous studies on user satisfaction suggest the opposite, in that users that have actively participated in the process have increased expectations and thus less understanding in cases where their needs have not been met.

Based on the theoretical background it was suggested that project teams should attempt to limit user expectations, and avoid any unnecessary user participation, while still support developers in their struggle with ambiguous requirements. Adding to this suggestion that project teams also should strive to make all users feel included, it becomes clear that successful *user involvement* in practice is anything but trivial.

5.3 Success Factors in General

The lists of critical success factors are unfortunately sometimes presented with an indication of a guaranteed success. One would therefore be tempted to believe that it is relatively easy to achieve success. Yet, as demonstrated with user involvement, each factor may have multiple aspects. Some of these lists do little more than stating that user involvement is an important factor. However, user involvement is like success not a 'black and white' concept. The projects studied all practiced user involvement to some extent. Hence, the challenges related to user involvement seemed to go beyond the decision on whether to involve users or not. On the contrary, user involvement seemed more appropriately considered a finely tuned gradient from most to least involvement as perceived by the various users. Some users that apparently seem to have been involved to the same extent may not feel that way. Thus, merely stating that user involvement is an important factor seems to have little real value, and seems a valid illustration of why a mere list of success factors seems insufficient in order to achieve success.

With that being said, these findings do not conclude that no lists of success factors have real value. Some of the lists are extended with reflections on valuable experiences related to each of the factors, and also why the authors have chosen each of these factors. In such cases, these reflections may be quite valuable for organizations or project teams investing an effort in improving their execution of projects. Altogether, lists of success factors may be dangerous if blindly accepted without further consideration, but may be of value when attempting to discover areas in which others have failed to succeed.

6

Conclusion

The findings of this study support the hypothesis that no ultimate selection of success criteria exists so far, even when considering dynamic selections in an attempt to incorporate context into the selection. The unique context that affects IT projects results in different appropriate criteria for various projects. Stakeholders' criteria and project objectives were investigated as dynamic selections, however, none of them seemed applicable for all projects. Various weaknesses were discovered with both approaches in the projects studied. Consequently, both project objectives and stakeholders' underlying criteria may serve as a valid selection of success criteria for some projects, however, an attempt of generalization was rejected. One might be tempted to suggest a generalization of the appropriate success criteria for each of the various stakeholder groups. However, the underlying criteria reported within each stakeholder group in these cases seemed to have few similarities. In the end, the appropriate success criteria and the corresponding success factors seems to be a matter of definition.

Additionally, as no ultimate selection of criteria seems to exist, nor does an ultimate list of critical success factors. Different criteria demand the need for different factors. The real value of critical success factors seems furthermore limited. User involvement is like success not a 'black and white' concept. However, user involvement may mistakenly be interpreted this way when considering lists of factors. The results of this study support the theory that user involvement is not limited to the choice of involving users or not. On the contrary, user involvement consists of multiple aspects that are anything but trivial to combine. Hence, merely stating that user involvement is an important success factor seems to provide little real value.

Further Work

Continuous research should be invested in understanding the context that affects projects, and in understanding pros and cons following the various selections of success criteria. The purpose would be to provide an optimal basis for selecting the appropriate criteria for each project. Unfortunately, little research seems to investigate whether different stakeholders actually is capable of accepting/agreeing on the criteria despite their interests, and what factors may contribute towards such acceptance. In addition, too much research seems to focus explicitly on user involvement in the light of highly-involved users,

as opposed to less involved users. Inevitably, some users will be involved less than others, and additional efforts should be made in order to understand how to safeguard the satisfaction of those users as well.

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Appendix A

Case A

A.1 Information Letter

Informasjon vedr. intervju i forbindelse med prosjektoppgave Høsten 2012

Takk for foreløpig positiv tilbakemelding vedr. intervju i forbindelse med prosjektoppgave denne høsten.

Jeg er masterstudent i Datateknikk på NTNU, og holder i den forbindelse på med en prosjektoppgave som en del av min fordypning. Temaet for oppgaven er suksess i IT-prosjekter, og jeg skal relatert til dette forsøke å kartlegge hvorfor IT-prosjekter fortsatt ikke går som planlagt, til tross for at vi i dag har mangfoldige lister på "kritiske suksessfaktorer". I den forbindelse vil jeg prøve å belyse hvorfor det ikke er så lett å følge disse som forskningslitteraturen skal ha det til. Nå i høst er jeg derfor interessert i å belyse forskjeller og likheter mellom evalueringer av samme IT-prosjekt blant forskjellige interessenter (brukere, prosjektleder(e), prosjekteier(e), initiativtakere, etc.), og hvordan disse blir ivare tatt i prosjektene.

For å finne ut av dette, ønsker jeg å intervju 3-5 slike interessenter i et prosjekt. Spørsmålene vil dreie seg om involvering i prosjektet, meninger om prosessen dersom man har vært involvert, meninger om det endelige utfallet av prosjektet, samt tanker om hva som burde vært annerledes. Jeg vil bruke båndopptaker dersom du tillater det, og i noen tilfeller også ta notater mens vi snakker sammen. Intervjuet vil ta omtrent en time.

Opplysningene som kommer frem gjennom intervjuet vil bli behandlet konfidensielt, og ingen enkeltpersoner vil kunne gjenkjennes i den ferdige oppgaven. Opplysningene anonymiseres og opptakene slettes når masteroppgaven er ferdig, innen utgangen av 2013. Det er frivillig å være med og du har mulighet til å trekke deg når som helst underveis, uten å måtte begrunne dette nærmere. Dersom du trekker deg vil alle innsamlede data bli fjernet.

Hvis det er noe du lurer på kan du ringe meg på 934 90 047, eller sende en e-post til skovly@stud.ntnu.no. Du kan også kontakte min veileder Eric Monteiro ved Institutt for datateknikk og informasjonsteknologi på epost eric.monteiro@idi.ntnu.no.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste (NSD).

Med vennlig hilsen

Jørgen Skovly
934 90 047
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A.2 Interview Guides

Intervjuguide - prosjektleder

Husk å alltid introdusere deg selv - din egen bakgrunn og hvorfor du gjennomfører akkurat dette casestudiet.

Introduksjon:

- Kan du forklare kort din egen bakgrunn før du kom til denne bedriften og dette prosjektet?

- Utdannelse
- Tidligere prosjekter
- Introduksjon for dette prosjektet

- Kan du forklare kort rundt kollektivtrafikken i Buskerud?

- Har samme firma ansvar for all kjøring i fylket?
- Hvor ofte er det anbud på kjøringen?
- Nå er det Nettbuss – hvem var før det?

Prosjektet:

- Introduksjon til prosjektet

- Når ble du introdusert for prosjektet?
- Hvordan ble du introdusert?
- Lignende erfaring fra tidligere prosjekter?
 - * Du nevnte at det ikke var vanlig med slike prosjekter hos dere?

- Hva var status på prosjektet når du kom inn?

- Hvor langt hadde prosjektet kommet?
- Hvorfor byttet de prosjektgruppe - byttet de bare prosjektleder?
 - > Sammenheng med Buskerud Kollektivtrafikk opprettet i 2009?
- Hvilke dokumenter fikk du tilgang på?
- Hva tok du utgangspunkt i når du begynte på arbeidet?
- Hadde du noen klar oppfatning av målsetningene med prosjektet?
 - * Ble dette kommunisert til deg?
- Hadde du en klar oppfatning av hva dere faktisk ønsket å oppnå med prosjektet?
 - > Leste en artikkel på Buskerud Fylkeskommune sine nettsider der det stod at det nye systemet var basert på norsk standard, som kunne forenkle samordningen med andre områder i fremtiden. Samt at billettmaskinene om bord var slitne og måtte byttes ut. Har du den samme oppfatningen?

- Hvordan var prosjekthverdagen?

- Hvor mye av din tid var det meningen at du skulle bruke på prosjektet?
 - Hvor mye av din tid brukte du på prosjektet?
 - Hvor ofte hadde dere møter?
 - * Hvem var med på disse møtene?
 - * Hvem valgte ut disse?
- > Dette vil avdekke hvorvidt de har tatt bevisste valg om hva de ønsket å prioritere i henhold til målsetningene for prosjektet.

- Kan du forsøke å ta meg kort igjennom prosjektprosessen fra du kom inn til prosjektet ble avsluttet?

- Hvordan jobbet dere? Iterasjoner?
- Møtte dere på noen utfordringer?

- Hva er status på prosjektet nå?

- Hvem drifter prosjektet?
- Ser dere på prosjektet som avsluttet?
- Hva er eventuelt planene deres videre med prosjektet?

Systemet:

- Kan du forklare sluttproduktet i store trekk?

- Systembeskrivelse som enkelt kan leses?
- Systemdeler -> Brukere
 - * Bussjåfører?
 - * Kundeservice?
 - * Billettsalg?
 - * Rapportering?
 - * Regnskap?

- Har du oversikt over hvilke endringer innføringen av systemet har medført?

- Hva var situasjonen før?
- Hvilke endringer har det gjort for brukerne?

Evaluering:

- Har dere hatt noen form for evaluering av prosjektet?

- Brukerundersøkelser?
- Har prosjektgruppen internt evaluert prosjektet?
 - * Hvorfor / hvorfor ikke?
- Andre stakeholders?

- Hva vil du legge til grunn for en evaluering av prosjektet?

- Suksess eller ikke suksess?
- Hva legger du til grunn for evalueringen?
- Var det avklart på forhånd hva som ville bety suksess, og hva som ikke ville bety suksess?

Intervjuguide - Prosjektgruppen

Husk å alltid introdusere deg selv - din egen bakgrunn og hvorfor du gjennomfører akkurat dette casestudiet. Presiser at alt er anonymt, og konfidensielt, slik at ingenting av de personen sier vil bli brukt direkte.

Introduksjon:

- Kan du forklare kort din egen bakgrunn før du kom til denne bedriften og dette prosjektet?

- Utdannelse
- Tidligere bedrifter / stillinger
- Tidligere prosjekter

Prosjektet:

- Introduksjon til prosjektet

- Når ble du introdusert for prosjektet?
- Hvordan ble du introdusert?
- Hva har vært din rolle i prosjektet?

- Hvordan var oppstarten i prosjektet for din del?

- Hva tok du utgangspunkt i når du begynte på arbeidet?
- Hadde du noen klar oppfatning av målsetningene med prosjektet?
- Hadde du en klar oppfatning av hva dere faktisk ønsket å oppnå med prosjektet?
 - * Ble dette kommunisert til deg?
 - * Var dette definert i noen dokumenter?

- Hvordan var prosjekthverdagen?

- Hvor mye av din tid var det meningen at du skulle bruke på prosjektet?
- Hvor mye av din tid brukte du på prosjektet?
- Hvor ofte hadde dere møter?
 - * Hvem var med på disse møtene?
 - * Hvem valgte ut disse?
- Hadde du noe ansvar for involvering av brukere?
 - > Hvordan involverte dere de forskjellige brukerne?
 - > Hadde dere en bevisst prioritering av de forskjellige brukerne?

- Hvilke utfordringer møtte dere på i løpet av prosessen?

- Hva er status på prosjektet nå?

- Hvem drifter prosjektet?
- Ser dere på prosjektet som avsluttet?
- Hva er eventuelt planene deres videre med prosjektet?

Evaluering:

- Har dere hatt noen form for evaluering av prosjektet?

- Brukerundersøkelser?
- Har prosjektgruppen internt evaluert prosjektet?
 - * Hvorfor / hvorfor ikke?
- Andre stakeholders?

- Hva vil du legge til grunn for en evaluering av prosjektet?

- Suksess eller ikke suksess?
- Hva legger du til grunn for evalueringen?
- Var det avklart på forhånd hva som ville bety suksess, og hva som ikke ville bety suksess?

Intervjuguide - brukere

Husk å alltid introdusere deg selv - din egen bakgrunn og hvorfor du gjennomfører akkurat dette casestudiet. Presiser at alt er anonymt, og konfidensielt, slik at ingenting av de personen sier vil bli brukt direkte.

Introduksjon:

- Hva er din stilling i bedriften?

- Hvor lenge har du jobbet her?
- Har du hatt samme stilling hele tiden?
- Hva har du jobbet med tidligere?

Prosjektet:

- Når og hvordan ble du introdusert for prosjektet?

- Har du noen oppfatning av hva målsetningene med prosjektet var?

- Har målsetningene blitt kommunisert til deg direkte?

- Hvordan føler du at du har blitt involvert i prosjektet?

- Indirekte / direkte?
- Gjennom representant for din gruppe?
- Føler du at du har fått være med på å bidra til å forme det endelige utfallet?
- Har du fått komme med tilbakemeldinger i forkant av prosjektet?

- Hvordan har prosjektet / systemet fått betydning for din arbeidshverdag?

- Hvordan var situasjonen før?
- Hvordan er situasjonen nå? Hvordan bruker du systemet i dag?
- Er du fornøyd med forandringen?

- Hvordan har opplæringen av systemet vært?

- Har du fått komme med tilbakemeldinger underveis / i etterkant av opplæringen?

Evaluering:

- Har du fått være med på noen form for evaluering av prosjektet?

- Hva vil du legge til grunn for en evaluering av prosjektet?

- Suksess eller ikke suksess?
- Hva legger du til grunn for evalueringen?
- Føler du at det var det avklart på forhånd hva som ville bety suksess, og hva som ikke ville bety suksess?

Appendix B

Case B

B.1 Information Letter

Informasjon vedr. intervju i forbindelse med masteroppgave Våren 2013

I forbindelse med min masteroppgave i Datateknikk ved NTNU, har jeg fått tillatelse til å kontakte deg vedr. forespørsel om intervju rundt involvering i prosjekter i [REDACTED].

Temaet for oppgaven min er overordnet *suksess i IT-prosjekter*, og jeg skal relatert til dette forsøke å kartlegge utfordringer i praksis, samt forskjellige måter å håndtere disse. Jeg har i den forbindelse fått muligheten til å få et innblikk i flere av de pågående prosjektene i [REDACTED], og er interessert i å belyse hvordan forskjellige interesser har blitt / blir ivaretatt i de forskjellige prosjektene, særlig gjennom å se på involvering av brukere.

Spørsmålene under intervjuet vil dreie seg om din involvering i forbindelse med behovskartleggingen og kravspesifiseringen, samt litt rundt generelle oppfatninger av prosjektet. Intervjuet vil som nevnt i epost bli gjennomført over telefon, og kommer til å vare alt fra 10-30 minutter, helt avhengig av hvor mye du ønsker å fortelle. Jeg kommer ikke til å benytte båndopptaker, men vil ta notater mens vi prater.

Ingen opplysninger som kan identifisere deg vil bli notert, og opplysningene som kommer frem gjennom intervjuet vil uansett bli behandlet konfidensielt. Enkelt personer vil derfor ikke kunne gjenkjennes hverken gjennom notater eller ferdig rapport. Notatene vil uansett slettes når masteroppgaven er ferdig, innen utgangen av 2013. Det er frivillig å være med og du har mulighet til å trekke deg når som helst underveis, uten å måtte begrunne dette nærmere. Dersom du trekker deg vil alle innsamlede data bli fjernet.

Intervjuene vil være veldig uformelle, og dersom det er noe du opplever som ubehagelig eller ikke ønsker å svare på, har jeg naturligvis full forståelse for det, og setter veldig stor pris på om du gir beskjed umiddelbart.

Hvis det er noe du lurer på kan du ringe meg på 934 90 047, eller sende en e-post til skovly@stud.ntnu.no. Du kan også kontakte min veileder Eric Monteiro ved Institutt for datateknikk og informasjonsteknologi på epost eric.monteiro@idi.ntnu.no.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste (NSD).

På forhånd takk for tiden din. Jeg ser veldig frem til en prat med deg!

Med vennlig hilsen

Jørgen Skovly
934 90 047
skovly@stud.ntnu.no

B.2 Interview Guides

Intervjuguide - Behovskartlegging

Husk å alltid introdusere deg selv - din egen bakgrunn og hvorfor du gjennomfører akkurat dette casestudiet. Presiser at alt er anonymt, og konfidensielt.

Prosjektet:

- **Kan du forklare litt hva selve prosjektet går ut på?**
 - Hva er hensikten / målsetningene med prosjektet?
 - Når startet det opp?
 - Hvor langt har man kommet nå?
 - Hva har vært / er din rolle i prosjektet?

Behovskartlegging:

- **Kan du fortelle litt om behovskartleggingen?**
 - Hvordan gjennomførte du / dere kartleggingen?
 - Hvem var med på kartleggingen?
 - Har dere hatt noen utfordringer?
 - > Utfordringer dokumentert eller evaluert på noen måte?
 - Hadde du/dere noen erfaringer med behovskartlegging fra tidligere?
 - Hva er mest nødvendig for å lykkes med behovskartleggingen sett fra ditt ståsted?

- Kan du fortelle litt om interessentene?

- Hvordan ble de plukket ut?
 - > Var noen med fra et eventuelt forprosjekt?
- Var det noen spesiell prioritering av interessenter, eller var det mer tilfeldig?
- Hatt noe fokus på at de som er intervjuet skal representere en større mengde?

- Evaluering i etterkant

- Har de involverte fått muligheten til å komme med noe tilbakemelding?
 - > På selve prosessen?
 - > På eventuelle resultater?
- Har de fått se noen resultater?

Intervjuguide - Brukere

Husk å alltid introdusere deg selv - din egen bakgrunn og hvorfor du gjennomfører akkurat dette casestudiet. Presiser at alt er anonymt, og konfidensielt.

Involvering:

- Hvordan oppleve du det å bli involvert i prosjektet?

- Intervjurunden:

- Kan du fortelle litt om hva syns du om det å være med? Positivt/negativt?
- Noe som burde vært gjort annerledes?
- Tenkte du noe på hvordan dine tilbakemeldinger skulle gjenspeile din brukergruppe sine interesser?

- Workshops:

- Totalt:

- * Har du hørt/sett noe i etterkant som har indikert hvordan det endelige resultatet blir? Fått komme med tilbakemeldinger på disse resultatene?
- * Hvilke forventninger har du til det endelige resultatet?
- * Har du noen oppfatning av når det endelige resultatet kan tas i bruk?

* Hvordan syns du oppfølgingen har vært i etterkant?

Evaluering:

- Hva vil du legge til grunn for en evaluering av prosjektet?

- Suksess eller ikke suksess?
- Hva legger du til grunn for denne evalueringen?
- Har det blitt kommunisert hva som vil regnes som suksess?
- Har målsetningene med prosjektet blitt kommunisert?