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How to manage the uncertain?

An exploratory case study of the challenges associated with defining success criteria for innovation projects

ABSTRACT

Ageing populations are globally putting pressure on policy-makers to invest in innovations that can improve and streamline healthcare practices. As these investments use scarce public resources policy-makers need to be able to justify the investments to various stakeholders in society. However, innovation as a phenomenon is characterized by several aspects, a high degree of uncertainty, a dependence on learning from failure and an unpredictable time frame, that imply it is not applicable or appropriate to evaluate using traditional project management methodologies. The purpose of this thesis is therefore to research to what extent traditional project management methodologies apply for assessing success in innovation projects. This is done through an exploratory case study on a healthcare innovation project within the scope of a public private partnership between the Karolinska University Hospital and Philips Healthcare. From previous project management literature we derive a theoretical framework with three dimensions of 'Project management', 'Project objectives' and 'Organizational benefit' that we analyze with an alternative perspective derived from innovation literature. A qualitative methodology is applied, consisting of an extensive pre-study and a main study of 16 interviews with project stakeholders with various interests and involvement in the project. We conclude limited support for assessing innovation projects in the dimensions of 'Project management' and 'Organizational benefits'. Instead, our analysis suggests healthcare innovation projects should be evaluated on the objectives the anticipated innovation is expected to lead to. The reasons for this can to a large extent be explained by the nature of innovation being uncertain, dependent on learning from failure, and associated with an unpredictable time frame. However, additional explanations, for instance that assessing success criteria is connected with a cost and effort that needs to be taken into account, are also presented and analyzed in this thesis.

Key words: Project Management, Success criteria, Success factors, Innovation, Healthcare.

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LIST OF ABBREVIATIONS, ACRONYMS & TERMS

PPP – Public Private Partnerships

PM - Project Management

HIT – Health IT

QoC – Quality of Care

RQ – Research Question

SRQ – Sub Research Question

ATQ – Analyzing Theory Question

Urology – The branch of medicine that focuses on surgical and medical diseases of the urinary tract system and the male reproductive organs

Oncology – The branch of medicine that deals with the prevention, diagnosis and treatment of cancer

Radiology – A medical specialty that uses imaging to diagnose and treat diseases seen within the body

Pathology – The scientific study of the nature of disease and its causes, processes, development, and consequences

1 INTRODUCTION

The global population aged 60 or above is expected to more than double from 841 million in 2013 to over 2 billion in 2050 (United Nations, 2013). An ageing population has major social and economic implications as the need for healthcare will increase and less resources will be available to distribute to various areas of society if fewer professionally active people must support an increasingly larger proportion of the population (Public Health Agency of Sweden, 2016). The Economist Intelligence Unit (EIU) (2014) has estimated global health spending in 2014 to be 10.3 percent of global GDP and projects it to accelerate by an annual average of 5.4 percent during 2014-2018. Meeting the increasing demand for healthcare services and reducing the rising costs of healthcare have become a tug-of-war that governments, healthcare delivery system providers, insurers, suppliers and consumers need to deal with (Deloitte, 2016). In this development the need for innovations that can improve and streamline healthcare becomes critical for the future of the economy as well as for the health of the public. Innovation is both improvements in technology and better methods to do businesses/operations and is manifested by changes in products, processes, marketing, distribution or new ways to define an offer (Porter, 2001).

Many countries are experimenting with innovation in the public sector with the hope to solve problems such as the ones presented above, for instance through ‘public private partnerships’ (PPP), in which public and private parties collaborate to support innovation (Swedish Agency for Growth Policy Analysis, 2016). In order to spread and expand the use of innovations public policy-makers need to be able to justify the innovations as good investments to society as they use scarce public resources (Georghiou, 1998). This becomes problematic as innovation as a phenomenon is characterized by a high degree of uncertainty (Perrin, 2002) (Roffe, 1999) (Castellaci, Grodal, Mendonca, & Wibe, 2005) (Foster, 2010), a high dependence on learning from failure (Drucker, 2002) (Champion & Carr, 2000) (Hargadon & Sutton, 2000) (Peters & Rodabaugh, 1988) and an unpredictable time frame (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998), which complicates the measuring and forecasting that innovation policy-makers need in order to justify public spending. Simultaneously, despite several attempts to develop success criteria frameworks to evaluate projects by (Atkinson, 1999) (Baccarini, 1999) (Barclay, 2008) (Shenhar, Levy, & Dvir, 1997), traditional project management (PM)

research has not incorporated the complications of measuring innovation just presented but rather assumed that criteria such as time, cost and quality can be defined upfront. In addition, previous PM frameworks have failed in clearly distinguishing between relating but differing concepts such as success factors, success criteria, project objectives and PM objectives (Lim & Mohamed, 1999) (Cooke-Davies, 2002) (de Wit, 1988). This thesis will derive a theoretical framework for success criteria based on previous research that more clearly distinguishes among these conceptual definitions and is specifically designed for healthcare innovation projects. The framework will then be applied to a case study of a specific healthcare innovation project within the scope of a PPP. Next the research opportunity and the case will be introduced after which the theoretical gap and research question (RQ) will be presented.

1.1 The Research Opportunity

One of Sweden's most highly recognized hospitals, the Karolinska University Hospital, has developed a model for cooperating with private industry parties in order to promote healthcare innovations. The partnerships are between the Karolinska University Hospital and suppliers of medical technology and their aim is to jointly develop innovations. (Karolinska, 2016) One of these partnerships is between the Karolinska University Hospital and Philips Healthcare within imaging technology (The Guardian, 2014). The partnership provides a promising environment for researching the opportunities for innovation this kind of PPP can bring according to the Swedish Agency for Growth Policy Analysis (2016). One of the first pilot projects within the scope of the partnership is for an imaging and information system in the prostate cancer department. This pilot project was chosen based on several tangible potential benefits, for instance the system could lead to more efficient and more accurate decision-making processes before prostate cancer treatments as well as less manual work in patient registration and data reporting. This thesis will adopt a case study approach on this particular pilot project. A pre-study was carried out in order to understand the unique setting of the case and to identify potential research topics.

1.2 The Case

The pre-study was carried out during January and February of 2016 at the Karolinska University Hospital. The aim was to understand the structures behind the partnership and the pilot project in order to pinpoint a RQ. The pre-study consisted of interviews with strategically and operationally involved participants, observations of clinical practices at the prostate cancer department and an observation of a workshop attended by the project members. The pre-study activities were done in parallel to studying

the latest research in healthcare innovation, implementation and PM. The result of the pre-study was an understanding of the processes of the prostate cancer department and the aim of the pilot project which will briefly be elaborated below.

Prostate cancer is the most common cancer form in Sweden and primarily affects older men. Patients have good chances of cure by surgery or radiotherapy if the tumor does not extend outside the capsule of the prostate. However, both treatments entail considerable risks for complications of urinary incontinence and erectile problems that can significantly affect patients' quality of life. The urologist responsible for value-based healthcare at the department for prostate cancer has identified potential improvements that could be achieved by using an information system that stores and displays information in a more structured and efficient way.

The project was chosen based on its potential to improve the prostate cancer care at the Karolinska University Hospital. However, the exact improvements are difficult to define and even more problematic to measure. The pre-study shed light on the uncertainty of objectives and expected outcomes of the project. The project stretches for one year after which, if the outcome is successful, the Karolinska University Hospital would start a procurement process to buy the developed innovation. However, neither guidelines nor criteria have been developed to assess, track or measure the progress and impact of the project.

The project is an opportunity to research the challenge of how to measure an innovation project as it is clearly a project with a set time-frame and project stakeholders while at the same time highly uncertain with a lack of clarity in outcomes and objectives.

1.3 Theoretical Gap and Research Question

The theoretical gap this thesis addresses can be viewed in two steps. The first step is found in existing PM literature and concerns the lack of a comprehensive framework for project success criteria. Even though attempts have been made, PM research has historically not been decisive enough in distinguishing among conceptual definitions such as success factors, success criteria, project success and PM success (Lim & Mohamed, 1999) (Cooke-Davies, 2002) (de Wit, 1988). Therefore, no comprehensive framework for evaluating project success has emerged. This thesis will use previous research to more clearly distinguish among the different concepts and explain how they relate to each other. The result of this will be presented as a proposed comprehensive theoretical framework, specifically for success criteria.

Secondly, innovation as a phenomenon is characterized by several aspects, a high degree of uncertainty (Perrin, 2002) (Roffe, 1999) (Castellaci, Grodal, Mendonca, & Wibe, 2005) (Foster, 2010), a dependence on learning from failure (Drucker, 2002) (Champion & Carr, 2000) (Hargadon & Sutton, 2000) (Peters & Rodabaugh, 1988) and an unpredictable time frame (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998), that would imply it is not applicable or appropriate to evaluate using traditional PM methodologies. The second step of the theoretical gap is therefore to research how applicable a success criteria framework derived from previous PM literature actually is for innovation projects. The theoretical gap can be summarized by the RQ of this thesis:

RQ: To what extent are traditional success criteria applicable to innovation projects?

The thesis now continues with the theory chapter in which relevant literature on both PM and innovation will be presented.

2 THEORY

The theory chapter starts by introducing our conceptual theory on PM (2.1). The insights presented are then consolidated into a theoretical framework (2.1.3). Following that, an alternative view is presented about innovation and how defining success criteria can be questioned and even counter-productive in innovation projects (2.2). The theory section ends with outlining how the theoretical gap will be addressed using the theoretical framework and the alternative view on innovation (2.3).

2.1 Conceptual Theory – Project Management

Since the emergence of PM as a research field in the 1960s researchers have been intrigued to investigate what factors lead to success or failure of projects as well as how to measure project success (Cooke-Davies, 2002). To understand how researchers have approached this it is useful to distinguish between the two concepts ‘success factors’ and ‘success criteria’. Success factors are *“those inputs to the management system that lead directly or indirectly to the success of the project or business”* while success criteria are defined as *“the measures by which success or failure of a project will be judged”* (Cooke-Davies, 2002). In other words, success factors contribute towards project success while success criteria are used to evaluate project success. Lim and Mohamed’s (1999) illustration (Figure 1) is intuitive in showing not only how the concepts are linked, in terms of the success factors affecting the performance on the criteria that have been set up to measure success, but also how they clearly differ from one another.

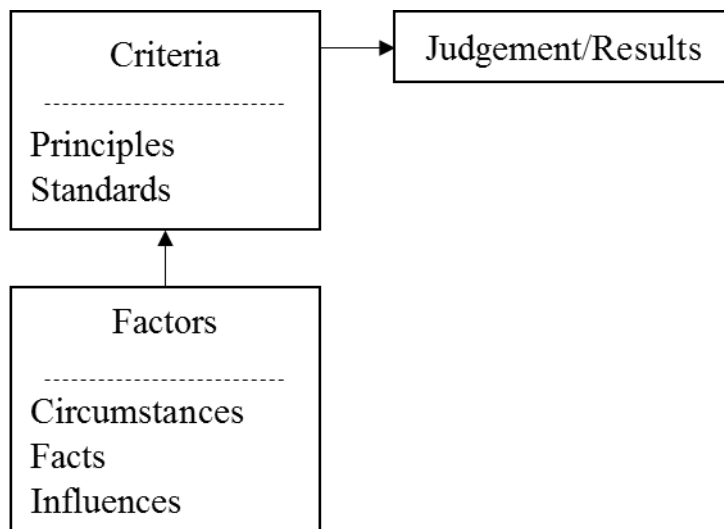


Figure 1. Pictorial representation of criteria and factors for project success (Lim & Mohamed, 1999)

Another important distinction to make within the research field of PM is between the concepts ‘project success’ and ‘PM success’. Project success deals with the effects of the project’s final outcome while PM success concerns managing the project process (Baccarini, 1999). The most appropriate criteria for project success are the project objectives (de Wit, 1988), implying success is achieved when the objectives of the project have been reached. However, the objectives of the project and the objectives of the PM are not necessarily the same and therefore it is important to make a conceptual distinction between criteria that assess the objectives of the project and criteria that assess the management of the project. A project can be a success even if the PM activity has been poor just as a project that has failed may still have had a successful PM activity (de Wit, 1988) (Davis, 2016). The distinction between these four concepts is important to make as it implies the success factors, contributing to success, and the success criteria, used for measuring success, are most likely different if the focus is on the success of the project or of the PM activity. The authors’ illustration of these conceptual distinctions can be viewed in Figure 2.

| | Success Factors | Success Criteria |
|-----------------|---|---|
| Project Success | What factors will contribute to achieving the project objectives? | On what criteria will the project objectives be evaluated on? |
| PM Success | What factors will contribute to successful management of the project? | On what criteria will the project management process be evaluated on? |

Figure 2. Conceptual distinction among project success related terms

These different definitions may seem straightforward but surprisingly researchers have often failed in separating both the success factors and success criteria as well as the project success and the PM success. One example is Davis (2016), who under the term ‘success dimensions’ mixes success factors, such as ‘Communication’ and ‘Top management support’, with success criteria, such as ‘Cost/budget’ and ‘Stakeholder satisfaction’, without acknowledging the important difference between the two concepts. The chapter continues by elaborating more closely on the individual concepts of success factors and success criteria.

2.1.1 Success Factors

Even though the factors that contribute to project success have been a topic of high interest for researchers and practitioners since the 1960s project results continue to disappoint stakeholders and no comprehensive list of success factors exists (Cooke-Davies, 2002). The 1980s and 1990s was a productive era during which many lists of critical success factor were produced. However, these were in general not organized or grouped to identify common themes and most often only devised intuitively rather than grounded in previous research. (Davis, 2014) The lists often varied in scope and purpose and usually focused on either very general factors or very specific factors, only relevant to one particular project (Belassi & Tukel, 1996). One example comes from Pinto and Slevin (1987), who produced the

ten success factors list and are the most widely recognized authors within this field according to Davis (2014). Their ten factors can be viewed in Table 1.

Table 1. Ten Success Factor List (Pinto & Slevin, 1987)

| Success Factor | Description |
|----------------------------|--|
| 1. Project Mission | Clearly defined goals and direction |
| 2. Top management support | Resources, authority and power for implementation |
| 3. Schedule and plans | Detailed specification of implementation process |
| 4. Client consultation | Communication with and consultation of all stakeholders |
| 5. Personnel | Recruitment, selection and training of competent personnel |
| 6. Technical tasks | Ability of the required technology and expertise |
| 7. Client acceptance | Selling of the final product to the end users |
| 8. Monitoring and feedback | Timely and comprehensive control |
| 9. Communication | Provision of timely data to key players |
| 10. Trouble-shooting | Ability to handle unexpected problems |

Despite being produced in 1987 the ten success factors list is still highly used and it is evident subsequent publications of alternative methods can be traced back to it (Davis, 2016).

Another example of an attempt to address this lack of a unified view of success factors that takes into account one of the distinctions highlighted above is provided by Cooke-Davies (2002) who empirically researches multiple projects in multiple organizations by separating the factors that lead to the PM success and the project success. He proposes eight factors that are critical to PM success and one factor that in addition to the previous eight is critical to project success, (Table 2).

Table 2. The "real" success factors on projects (Cooke-Davies, 2002)

| Success Factors for 'project management success' |
|--|
| F1 Adequacy of company-wide education on the concepts of risk management |
| F2 Maturity of an organisation's processes for assigning ownership of risks |
| F3 Adequacy with which a visible risk register is maintained |
| F4 Adequacy of an up-to-date risk management plan |
| F5 Adequacy of documentation of organizational responsibilities on the project |
| F6 Keep project (or project stage duration) as far below 3 years as possible (1 year is better) |
| F7 Allow changes to scope only through a mature scope change control process |
| F8 Maintain the integrity of the performance measurement baseline |
| Success Factors for 'project success' |
| F9 The existence of an effective benefits delivery and management process that involves the mutual co-operation of project management and line management functions. |

In addition to these attempts to define success factors for general projects, researchers have also tried to identify success factors for particular types of projects or projects in specific industries. In some cases

for quite general projects: agile software projects (Chow & Cao, 2008) and construction projects (Sanvido, Grobler, Parfitt, Guvenius, & Coyle, 1992). In other cases for very specific types of projects: enterprise wide information management systems projects (Sumner, 1999) and public-private partnership projects in the construction industry (Li, Akintoye, Edwards, & Hardcastle, 2005).

Reviewing existing literature it becomes evident that, even though many attempts have been made, no comprehensive framework for success factors in projects has emerged. Rather than just arguing more research is required we would like to raise the alternative view that the reason no comprehensive framework has emerged is because projects, by definition, are temporary and unique, and therefore all attempts to design a one-size-fits-all model is doomed to fail. More importantly, as will be outlined in the next section on success criteria, the definition of success may vary between stakeholders, which additionally increase the complexity of the process of designing a comprehensive list of success factors. One factor that ensures the project is completed within the designated time frame is potentially satisfying one stakeholder's definition of success while by no means guaranteeing a stakeholder primarily concerned with the quality of the final output will be satisfied. Therefore, this thesis will completely decouple the concepts of success factors and success criteria and focus on the latter. We will now present previous research on success criteria and then consolidate the insights into a theoretical framework.

2.1.2 Success Criteria

In similarity to success factors the topic of success criteria has seen definite development in recent decades but still no distinctive framework has been established. This suggests a need for further research on how to define appropriate success criteria as several researchers have argued for the importance of defining success criteria. Baccarini (1999) states that if the criteria for measuring success are not set at project initiation, different team members will travel in different directions. Similarly, Turner (2014) stresses that success criteria must be agreed with all stakeholders before project start and that all criteria need to be achieved to reach success. This next section starts with introducing the well-known but highly questioned 'iron triangle' for measuring project success, followed by a discussion on what additional perspectives researchers have suggested are necessary criteria for measuring success.

2.1.2.1 Iron Triangle

Historically, one of the most established methods for measuring project success is the iron triangle of time, cost and quality (Figure 3). However, these three concepts have been highly criticized for not fully capturing the complete aspect of what constitutes project success.

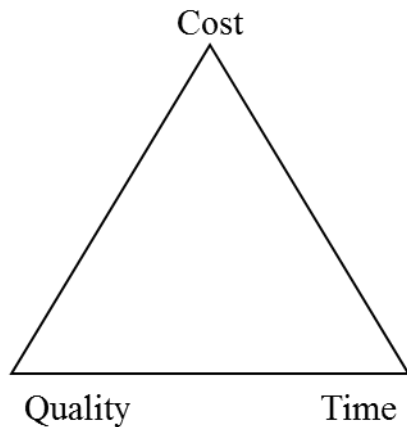


Figure 3. The Iron Triangle (Atkinson, 1999)

de Wit (1988) claims that time, cost and quality have been the three major objectives of PM in most literature but questions if achieving desired results on these objectives is enough for achieving project success. It has been argued the reason these three dimensions have received so much attention is not because they are mutually exclusive and collectively exhaustive criteria for project success, but rather because they often are included in the definition of PM (Atkinson, 1999). The key insight here is that these objectives are primarily concerned with the PM but have little or nothing to do with the project objectives and are therefore, based on the conceptual distinctions made previously, at best appropriate measurement for PM success but not for project success.

Atkinson (1999) criticizes the iron triangle by describing time and cost as, at best, guesses made at a time when little is known of the project and quality as a phenomenon by nature difficult to define because it is often changing and made up of peoples different attitudes and beliefs. The limitations of the iron triangle have also been highlighted by providing examples of famous projects that are inconsistent with its logic. For instance, the Sydney Opera House would be judged as a failure as it was 14 times over budget and was supposed to take 4 years to build but ended up taking 15. Still, the public judged the project successful and a “*great engineering achievement*”. (Davis, 2016)

2.1.2.2 Beyond the Iron Triangle

A common addition to the perspectives of the iron triangle that researchers have claimed is necessary is the perception of stakeholders involved in or affected by the outcome of the project, as success may mean different things to different stakeholders (Barclay, 2008). Initially, in the 1980s and 1990s, researchers added the perspective of the project manager and project team in the evaluation of project

success (Davis, 2014). As the idea of including stakeholders' perception matured, researchers started seeing the importance of including the perception of additional, both internal and external stakeholders (Lester, 1998). More stakeholders complicate the process of finding appropriate success criteria as success of a project may mean different things to different stakeholders. As an example, Wateridge (1998) found that the two stakeholder groups 'users' and 'project managers' rank success criteria differently with 'users' prioritizing "*Meets user requirements*", "*Happy users*" and "*Achieves purpose*" as the top three criteria compared to project managers who answered "*Meets user requirements*", "*Meets budget*" and "*Meets time*". Wateridge argues one reason that project managers value the cost and the time perspective highly is because they are often evaluated on these criteria and in some cases their future career may even depend on their performance on these criteria. de Wit (1988) claims stakeholders not only have different criteria for success but also that these criteria may be in conflict with each other and that a project can be a success for one party and a disaster for another. Using Wateridge's (1998) results as an example completing the project on time and within budget may very well be in conflict with achieving the highest possible result on "*Happy users*" as compromises have to be made.

2.1.2.3 Success criteria frameworks

As the limitations of the iron triangle have become an established view among researchers several attempts to establish a comprehensive framework for measuring project success have been made. This section presents five frameworks that all influence the theoretical framework that will be presented and that this thesis will derive its research design from.

Atkinson (1999) asks why PM has been so reluctant to adopt other criteria in addition to the iron triangle. Through an extensive review of previous writers' suggestions on criteria to include he presents the Square Route, which in addition to the iron triangle, includes 'The Information System', 'Benefits (Organizational)' and 'Benefits (Stakeholder Community)', see Figure 4.

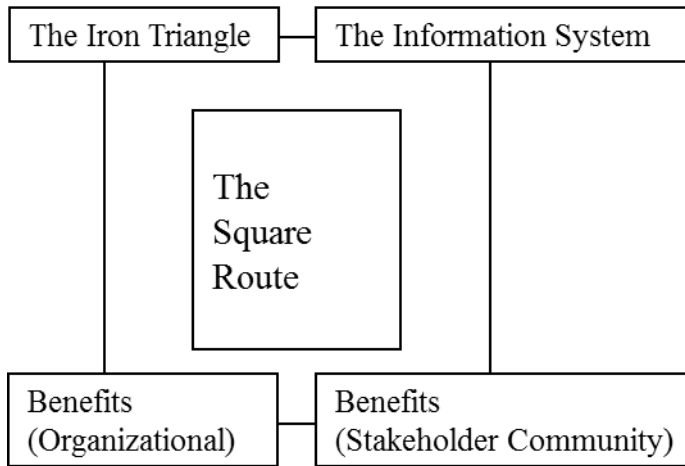


Figure 4. The Square Route (Atkinson, 1999)

These four dimensions are based on criteria previous writers have suggested are necessary to include in order to complement the iron triangle (Turner, 1993) (Morris & Hough, 1987) (Wateridge, 1998) (de Wit, 1988) (McCoy, 1987) (Pinto & Slevin, 1987) (Saarinen, 1990) (Ballantine, et al., 1996). Under each of these four perspectives Atkinson adds examples of specific criteria. These can be viewed in Table 3.

Table 3. Square route to understanding 'success criteria' (Atkinson, 1999)

| Iron Triangle | The information system | Benefits (Organizational) | Benefits (Stakeholder community) |
|---------------|-------------------------|---------------------------|------------------------------------|
| Cost | Maintenability | Improved efficiency | Satisfied users |
| Quality | Reliability | Improved effectiveness | Social and |
| Time | Validity | Increased profits | Environmental Impact |
| | Information-quality use | Strategic goals | Personal development |
| | | Organizational learning | Professional, learning, |
| | | Reduced waste | contractors profits |
| | | | Capital suppliers, content project |
| | | | team, economic impact to |
| | | | surrounding community |

The second framework is the 'Logical Framework Method for Defining Project Success' (Baccarini, 1999). It includes the same distinction between PM success and project success made in this thesis (even though Baccarini uses the term 'product success' to refer to what we refer to as 'project success'). For PM success, Baccarini includes the iron triangle, in combination with 'Quality of the project management process' and 'Stakeholder satisfaction'. He argues the iron triangle perspectives are only effectiveness criteria while there is also a need to include efficiency criteria, in terms of 'Quality of the project management process'. Examples include 'Anticipating all project requirements', 'Dealing with

the issues early’ and ‘Effective coordination and relation patterns between project stakeholders’. However, he raises the possibility that these efficiency criteria are rather “*variables contributing to project management success rather than measures of project management success itself*”, which would make them success factors rather than success criteria. This is yet another example of the challenge researchers have faced in separating the concepts success factors and success criteria. For project success he suggests ‘Project goal’, ‘Project purpose’ and ‘Stakeholder satisfaction’. The reasoning behind including ‘Stakeholder satisfaction’ for both PM success and project success is that the key stakeholders are different for the two. In assessing PM success the key stakeholders are the client and the project team while in project success it is the customer and/or user. (Baccarini, 1999)

The framework ‘Project Success Dimensions’ presents four dimensions to conceive the level of project success and suggests that assessing success is time dependent, see Figure 5 (Shenhar, Levy, & Dvir, 1997).

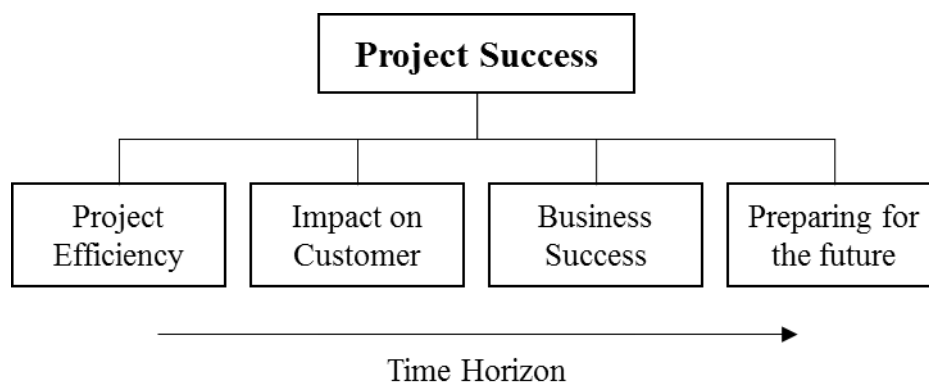


Figure 5. Project Success Dimensions (Shenhar, Levy, Dvir, 1997)

The first dimension, ‘Project efficiency’, focuses on how efficiently the project has been managed in terms of the perspectives of the iron triangle. This is the immediate dimension that may indicate a well-managed project but not necessarily any long-term benefit to the organization. The second dimension is ‘Impact on the customer’ (and/or the user). It addresses the importance organizations should place on the real needs of customers and can for instance include meeting performance measures, functional requirements, technical specifications and customer satisfaction. The third dimension, ‘Business and direct success’, addresses the project’s impact on the organization in terms of for instance sales, market share, profits etc. Finally, the fourth dimension, ‘Preparing for the future’, concerns preparing organizational and technological infrastructure for the future. As mentioned this framework interprets assessing success as time dependent and the fourth dimension is the most long-term dimension.

The fourth framework, the ‘Project Performance Scorecard’, acknowledges the iron triangle as insufficient because various stakeholders (business process owners, users, developers, managers), with different goals and objectives, are involved in assessing project outcomes (Barclay, 2008). The aim of the ‘Project Performance Scorecard’ is therefore to provide a tool that conveys both the tactical and strategic value of a project. This is done through six dimensions that are based on previous research on assessing project success as well as other strategic frameworks such as the ‘Balanced scorecard’, in which organizational performance is assessed through four perspectives: ‘Customer’, ‘Internal Business’, ‘Innovation and learning’ and ‘Financial’ (Kaplan & Norton, 1996). The six dimensions can be explained through the respective questions they aim to answer, see Table 4.

Table 4. Project Performance Scorecard dimensions and questions (Barclay, 2008)

| Dimension | Question |
|-------------------------|--|
| Project process | - What project opportunities are to be targeted and measured? |
| Benefit | - What benefits can be yielded from the project and its results? |
| Innovation and learning | - What are the knowledge capabilities of the project? |
| Quality | - How efficient are the project process and results? |
| Use | - How are the project results used? |
| Stakeholder perspective | - How do the stakeholders see the project? |

Even though not explicitly referred to, the ‘Project Performance Scorecard’ includes the perspectives of the iron triangle (‘Project process’ and ‘Quality’ dimensions). It also accounts for various stakeholders’ views (‘Stakeholder perspective’ dimension) as well as the organizational benefits from the project (‘Benefit’, ‘Innovation and learning’, ‘Use’ dimensions).

These four frameworks may vary slightly in their dimensions and how they define these but are in general build upon the same foundations, for instance the iron triangle, the stakeholder perspective and the organizational benefits. The last framework we will introduce has a unique touch as it is a success criteria framework specifically designed for healthcare IT (HIT), adding a perspective that is highly relevant for the case study of this thesis.

Scholars have found the two major research streams that have emerged in HIT to be ‘HIT adoption’ and the ‘Impact of HIT on healthcare performance’ (Agarwal, Gao, DesRoches, & Jha, 2010). The second of these, the impact of HIT, can be connected to the question in the top left of Figure 2: *“On what criteria will the project objectives be evaluated on?”* Within the stream of Impact of HIT there are two sub-streams, ‘Quality of care’ (QoC) and ‘Efficiency/financial performance’. QoC may for instance refer to ‘Mortality’, ‘Patience satisfaction’, ‘Patient safety’, ‘Medical errors’ etc. while

Efficiency/financial performance could be ‘Revenue’, ‘Cost/operating expenses’, ‘Productivity’ etc. These two types of impact imply that there are two types of objectives a healthcare project can aim to achieve, and therefore two sub-categories of project success in healthcare projects. Several studies have looked into HIT’s impact on QoC and found positive results, for instance on lower mortality rates (Devaraj & Kohli, 2000), improved vaccination rates (Dexter, Perkins, Maharry, Jones, & McDonald, 2004) and patient safety (Parente & McCullough, 2009). However, examples also exist in which research has generated less promising findings in terms of only small or no effects (Linder, Ma, Bates, Middleton, & Stafford, 1997) (Desroches, o.a., 2010) (Himmelstein, Wright, & Woolhandler, 2010) (McCullough, Casey, Moscovice, & Prasad, 2010) and in some cases even negative effects on care quality (Ash, Berg, & Coiera, 2004) (Koppel, o.a., 2005).

These five presented success criteria frameworks and in what way they contribute to the upcoming theoretical framework can be viewed in Table 5.

Table 5. Success criteria frameworks

| Framework | References | Contribution to theoretical framework |
|---|--------------------------------------|---|
| The Square Route | Atkinson, 1999 | Adds perspectives to the iron triangle such as direct and indirect benefits |
| Logical Framework Method for Defining Project Success | Baccarini, 1999 | Separates PM success and project success and the relevant stakeholders for both |
| Project Success Dimensions | Shenhar, Levy & Dvir, 1997 | Adds the time horizon and the long-term organizational perspective |
| Project Performance Scorecard | Barclay, 2008 | Complements project success frameworks with strategic, organizational perspective |
| Impact of HIT | Agarwal, Gao, DesRoches, & Jha, 2010 | Divides project objectives as Quality of Care or Efficiency/Financial Performance |

Several of these frameworks discuss some kind of long-term effects or organizational benefits as an area to evaluate a project by (Shenhar, Levy, & Dvir, 1997) (Barclay, 2008). While a long-term, organizational perspective is a potentially relevant dimension to evaluate a project by, neither of these frameworks proposes in detail what kind of long-term organizational benefits a project can contribute towards. A big problem in innovating organizations is that although enterprise information systems are implemented they do not lead to operational effectiveness (Santa, Scavarda, Zhao, & Skoko, 2011). In order to elaborate on how stakeholders in the case study of this thesis anticipate the innovation can impact the organization more long-term we introduce the five performance objectives used in operations

strategy. The following six paragraphs elaborating on the five performance objectives and the concept of trade-offs between them are all derived from Slack and Lewis (2015).

2.1.2.4 Organizational benefits

The five performance objectives are widely established in operations strategy (Slack & Lewis, 2015) and are applicable to all types of operations, but are usually applied to traditional, private corporations. As a hospital has rather different objectives than a traditional, profit-maximizing organization, how stakeholders define the long-term organizational improvements from the project according to these five performance objectives areas is highly interesting.

2.1.2.4.1 *Quality*

Quality refers to the specification of a product or service, implying quality is higher the closer the products or services are to “*doing what they are supposed to do*”. There are ‘hard’ and ‘soft’ aspects of quality. Hard aspects are concerned with the evident and largely objective aspects of the product or service, such as ‘Features’, ‘Performance’, ‘Reliability’, ‘Aesthetics’, ‘Security/safety’ etc. Soft dimensions are rather personal interaction aspects between customers/users and the product or service. For instance, ‘Helpfulness’, ‘Attentiveness’, ‘Communication’, ‘Friendliness’, ‘Courtesy’ etc.

2.1.2.4.2 *Speed*

Speed refers to the elapsed time between the beginning and end of a particular process within an organization. The definition of speed in a specific context is a matter of which process to track. It may relate to externally obvious events, such as the time from when the customer requests a product or service until when it is received. Or it can be used internally in the operation, for instance the time between when a material enters an operation until it has become fully processed and leaves the operation.

2.1.2.4.3 *Dependability*

The term dependability can be translated to keeping delivery promises. Together with speed it constitutes the total delivery performance. These two performance objectives are often linked as, theoretically, one could achieve high dependability by announcing long delivery times. The term dependability can be illustrated by the following equation:

$$\textbf{Dependability} = \textbf{Due delivery time} - \textbf{Actual delivery time}$$

When this equation equals zero, it indicates delivery is on time. A positive value indicates delivery is early while negative means it is late. Just as for speed the process to measure the dependability for can vary, for instance between the delivery time to the customer or for a certain internal operational process.

2.1.2.4.4 Flexibility

The term flexibility refers to two separate definitions. The first is 'range flexibility' which refers to the number of things an operation can do. For example, an operation may be able to produce a greater variety of products or services, or operate at different output levels. The second area required to fully explain flexibility is the 'response flexibility', which refers to the ease with which an organization can move between its possible states. Operations that quickly, smoothly and cheaply move from doing one thing to another thing are more flexible than those that only can achieve the same change at greater cost and/or organizational disruption.

2.1.2.4.5 Cost

The final performance objective is cost. For organizations competing directly on price, cost is clearly a major performance objective. However, cost is important for all organizations, as every amount removed from an operation's cost base is a further amount added to either profits or other investments. Cost is any financial input to the operation that enables it to produce its products and services. These financial inputs can be divided into three categories, which are 'operating expenditure', 'capital expenditure' and 'working capital'.

2.1.2.4.6 Trade-Offs

The concept of trade-offs among the five performance objectives was initially introduced by Harvard professor Wickham Skinner (1969). Trade-offs are based on the idea that excellence in one objective usually means poor performance in some or all other objectives. Slack and Lewis (2015) provide several examples of how trade-offs may appear in organizations. For instance, a call centre answering all requests within seconds, any time of the day or night, clearly has superior performance to one that takes several minutes to answer and closes during the night. However, it may be that the costs of running the operation of the first call centres make it necessary to charge higher fees.

2.1.3 Theoretical Framework

This section shows how the perspectives presented on success criteria and organizational benefits together can contribute to a clearer and more comprehensive framework for understanding success

criteria in healthcare innovation projects. The framework consists of the three dimensions ‘Project management’, ‘Project objectives’ and ‘Organizational benefits’.

The division of the dimensions Project management and Project objectives is based on Baccarini (1999) and the conceptual distinctions made in the beginning of this chapter (Figure 2). The criticism of the iron triangle does not claim that it is an inappropriate method for evaluating PM, but rather that time, cost and quality are insufficient criteria to assess the full scope of PM success (Atkinson, 1999), (Shenhar, Levy, & Dvir, 1997), (de Wit, 1988), (Baccarini, 1999). Therefore, we complement the perspectives of the iron triangle in our theoretical framework with the stakeholder perspective based on previous researchers’ suggestion (Barclay, 2008) (Davis, 2014) (Lester, 1998) (Wateridge, 1998) (de Wit, 1988). According to Baccarini (1999) PM success entails satisfying stakeholders’ needs where they relate to the PM process. It is important to note that the stakeholders assessing the PM activity are not necessarily the same as the ones assessing the objectives and outcomes of the project. According to Baccarini the key stakeholders during the PM process are the client and the project team.

The most appropriate criteria for project success are the project objectives and the degree to which these objectives have been met determines the success or failure of a project (de Wit, 1988). As discussed above in the HIT framework the types of objectives for healthcare projects can be divided into QoC and Efficiency/Financial Performance (Agarwal, Gao, DesRoches, & Jha, 2010). The first one, QoC, concerns improvements in healthcare related outcomes, for instance mortality, patient satisfaction, patient safety, medical errors etc. while examples of Efficiency/Financial performance include revenue, cost/operating expenses, value-added, productivity etc. These distinguished improvement objectives in healthcare projects are added to the theoretical framework under the dimension Project objectives.

The organizational dimension called for by previous researchers (Shenhar, Levy, & Dvir, 1997) (Barclay, 2008) is taken into account by including the five performance objectives (Quality, Speed, Dependability, Flexibility, Cost) (Slack & Lewis, 2015) under the Organizational benefits dimension in the theoretical framework. Including these five objectives into our theoretical framework will have two potential implications. Firstly, it will allow us to investigate how appropriate these objectives are for assessing project’s long-term effects on organizations. Secondly, it is also an opportunity to research how applicable these five objectives are for analysing a hospital organization compared to a traditional, private, profit-maximizing organization, for which they are usually applied.

The arrow labeled ‘Influences between the dimensions Project management and Project objectives is based on that good PM can contribute towards project success (de Wit, 1988). The second arrow between

Project objectives and Organizational benefits is based on researchers previously presented that call for evaluating project's long-term effect on the organization (Shenhar, Levy, & Dvir, 1997), (Barclay, 2008). The reasoning for including these arrows is not to research their exact relationship among the different dimensions but rather highlight how previous researchers have argued these dimensions relate to each other. The framework is presented in Figure 6.

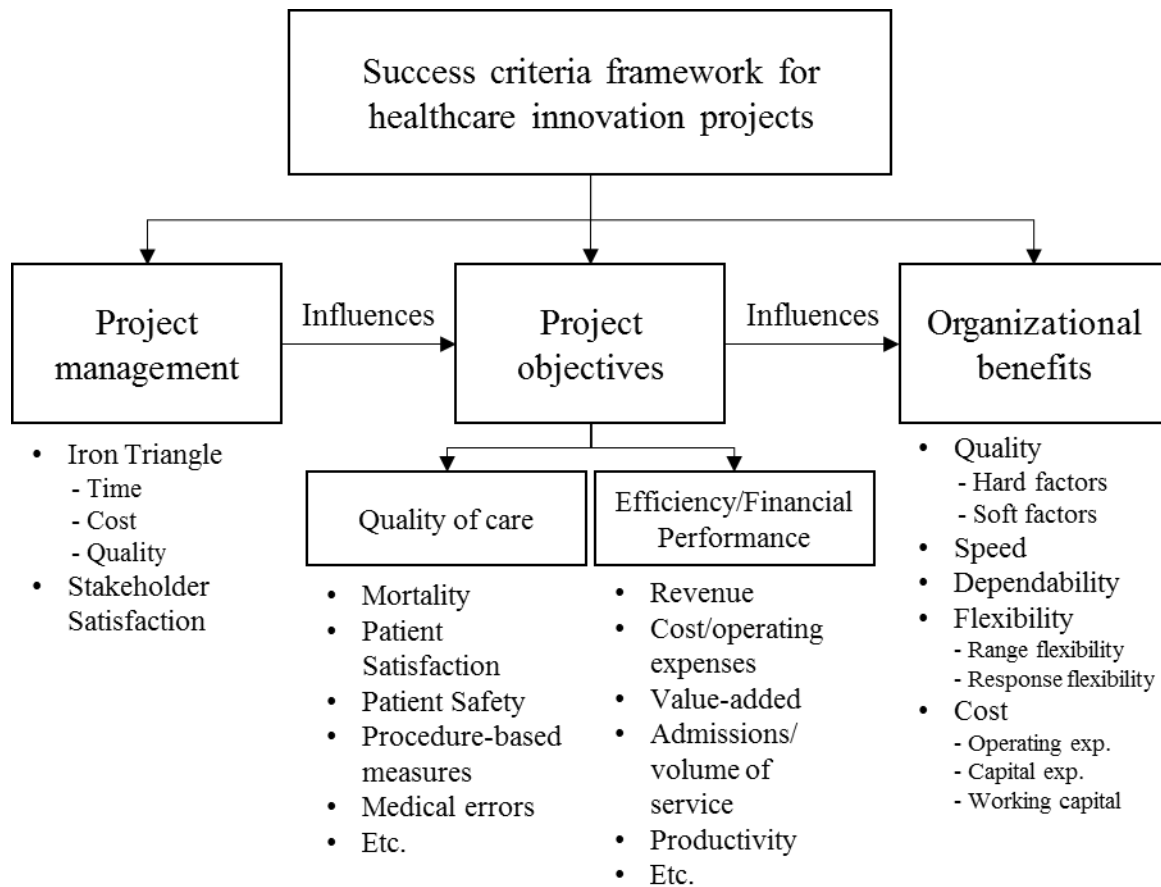


Figure 6. Success criteria framework for healthcare innovation projects

This theoretical framework will be the foundation to the research design we construct in order to answer our RQ. However, the theoretical gap of this thesis includes addressing if traditional PM literature can address healthcare innovation projects. Therefore, the theory chapter now continues with an alternative view on innovation that will be used as an analyzing theory in addition to this theoretical framework. Following that the theoretical gap will be restated together with an elaboration on how the theoretical framework in combination with the analyzing theory on innovation will address this gap.

2.2 Analyzing Theory - Innovation

An alternative view for assessing and measuring success can be derived from the research field of innovation. The study of the impact and characteristics of innovation began to accelerate during the 1970s as policy makers grew an increased understanding and awareness of the economic importance of innovation (Smith, 2000). As new innovation initiatives were launched to help firms become more innovative a strong desire developed to understand the impact and result of such policies. The decisions to fund innovation systems had to be justified to society and its political representatives as good investments, as they used scarce public resources (Georghiou, 1998). During the 1990s major efforts were put on developing innovation indicators, to link resource inputs to innovation output. Various data sources, such as R&D spending, patents records and objectives of innovation processes, were used to evaluate the innovation success of companies. However, it has been shown that such data has several limitations and faces fundamental challenges in catching all aspects of the originality, learning and change, which are involved in innovation. (Smith, 2000)

As researchers and policy makers argue for the need for new ways to evaluate innovation, some have started to question the purpose and appropriateness of attempting to measure innovation. Arundel (2001) means that at the macro level indicators such as innovation scorecards can be useful, e.g. *“in building consensus about the need for policy action in support of research”*. However, he argues that indicators are not relevant when it comes to measuring individual activities or organizations. Researchers point to different aspects that complicate evaluation of innovation. These can be grouped into three categories of complications, which are the uncertainty of innovation (2.2.1), the importance of learning from failure (2.2.2) and the time frame of evaluation (2.2.3). Although these categories may overlap and are not mutually exclusive the categorization facilitates understanding of the challenges of measuring innovation.

2.2.1 The Uncertainty of Innovation

As mentioned earlier innovation can take many forms as innovations are manifested by changes in products, processes, marketing, distribution or new ways to define an offer (Porter, 2001). Innovation includes inspiring the generation of ideas and testing promising concepts. Hence, innovation involves taking risks and is categorized by uncertainty. Perrin (2002) means that innovation is by the very nature risky and unpredictable in terms of five aspects viewable in Table 6.

Table 6. Perrin's (2002) five aspects of innovation uncertainty

| Innovation uncertainty aspects |
|--|
| Which particular activity or intervention will work or prove useful |
| Who will benefit |
| When benefits, if any, will occur |
| Under which particular set of circumstances an innovative approach would be applicable |
| Whether the discovery and application will be as intended or of quite a different nature |

Lambooy (2005) means that innovations sometimes have problem gaining support throughout organizations as the processes and outcomes are unpredictable. The relationship between required input and possible outputs are difficult to determine exactly which leads to uncertainty. (Roffe, 1999) (Castellaci, Grodal, Mendonca, & Wibe, 2005) (Foster, 2010). Kline and Rosenberg (1986) stated early *“Models that depict innovation as a smooth, well-behaved linear process badly misspecify the nature and direction of the casual factors at work. Innovation is complex, uncertain, somewhat disorderly, and subject to changes in many sorts”*. The perspective of innovation as a process has developed over time in which innovation is more often seen as an interplay between events and people, that produces action that influences events in subsequent stages that determine the direction, and if the process will continue or not (Cooper, 1998) (Smits, 2002).

Perrin (2002) argues that since innovation is unpredictable by definition it is impossible to find targets or meaningful objectives in advance. Evaluation approaches that aim to assess if innovation programs have reached pre-determined objectives risk penalize programs that prove limitations in objectives, because human beings want to avoid uncertainty. In organizations, uncertainty is usually characterized as a state that causes dissatisfaction, as individuals do not know how to proceed which causes confusion (Jalonen, 2011). Within the context of organizational change uncertainty avoidance is implicitly present, as individuals will be presented with new and confusing situations that threaten the status quo and trigger resistance (Kotter & Schlesinger, 1979) (Agboola & Salawu, 2011). Uncertainty avoidance can be seen as a form of change resistance, which may yield to organizational inertia (Hannan & Freeman, 1984) (Wong-Mingji & Millette, 2002). As innovation is about change, it signifies a break or discontinuity with the past (Bessant, 2003), uncertainty may therefore trigger resistance if results deviate from objectives.

2.2.2 Learning From Failure

Google, one of the world's most innovative companies (Boston Consulting Group, 2015), "*practically have failure as a requirement*" in their internal research centre Google X (CNN, 2015). The reason for this is that innovation is highly dependent on failure, as will be elaborated on below.

Since innovations are associated with risk and uncertainty, openness to learning becomes a key for effective innovation (Drucker, 2002). Researchers accentuate that you can learn at least as much from failures as from successes (Champion & Carr, 2000) (Hargadon & Sutton, 2000) (Peters & Rodabaugh, 1988). Drucker (2002) emphasizes that innovation often works in different ways than expected and that unexpected failure can be a key source of innovation opportunity. Peters and Rodabaugh (1988) take it one step further by claiming that many small failures can prevent big failures and that one should be a failure fanatic and search for interesting mistakes, reward them and learn from them. Mistakes and errors are crucial, because they can be eliminated and replaced by better beliefs in a process of competitive selection. Thus, "*errors and mistakes are not a bad thing; they are a necessary part of the process that generates economic growth*" (Foster, 2010).

However, failure has a negative connotation and is generally treated negatively, ignoring if the attempt was very ambitious or not (Perrin, 2002). Consequently, it is better to set low goals and meet expectations than aim high and fail. This means that performance indicators reward safe, short-term activities rather than those who explore the unknown. Perrin means that projects with a high record of success that claim to be innovative should be considered with skepticism, as it may indicate the projects were not very ambitious. In addition, Perrin is skeptical to performance measurements of innovation as it can be difficult, or even impossible, to quantify actual gains, including the identification of lessons from failures as well as from successes. He argues "*in order to meet performance targets with any certainty, it would only make sense to fund research to explore what is already known; to do otherwise would be too risky.*" Thus the perverse consequence of performance measurements can be less, rather than more, innovation and true impact.

2.2.3 The Time Frame of Evaluation

A third problematic aspect of measuring innovation is when to assess impact. In general, innovations are long-term and categorized by uneven progress, which mean that the payoff is seldom immediate (Drucker, 2002). It is not possible to do meaningful evaluation of impact prematurely. According to Perrin (2002) "*attempting to assess 'results' too soon can be counterproductive to the innovative process*". He continues by arguing the most common time frame for evaluations, 12 months, is way too

short to evaluate the impact of most innovative activities. Other researchers have found that the assessment of the long-term consequences of innovation is especially uncertain (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998), which means that it is difficult to prove the relationship between innovative activities and long-term consequences, as other factors will affect the outcome.

As mentioned above, these three categories may overlap but together they make a compelling case that assessing and measuring innovation activities is not necessarily a straightforward and ultimately positive process. The next section will present how the theoretical framework and the analyzing theory will address the theoretical gap.

2.3 Theoretical Gap

The theoretical gap this thesis aims to address is to what extent traditional PM success criteria apply to innovation projects. To address this gap we have developed a theoretical framework that distinguishes concepts such as success factors, success criteria, project objectives and PM objectives. Our research design will be derived from this theoretical framework. However, it is important to highlight the concerns raised in 2.2, that defining success criteria and evaluating projects with a high degree of innovation too extensively may be problematic. Therefore, the purpose of researching this framework is not to find a comprehensive list of success criteria in all dimensions of the framework. Instead, the purpose is rather to investigate *if* there are suitable success criteria in these dimensions, according to innovation project stakeholders. If that is not the case, can the lack of appropriate success criteria be explained by the innovation theory, or are there other potential explanations? To ensure the RQ of this thesis is dealt with in a structured manner three sub research questions (SRQ) have been developed for the three dimensions of the theoretical framework.

SRQ1: What kind of success criteria for project management, if any, do stakeholders define for healthcare innovation projects?

SRQ2: What kind of success criteria for project objectives, if any, do stakeholders define for healthcare innovation projects?

SRQ: What kind of success criteria for organizational benefits, if any, do stakeholders define for healthcare innovation projects?

The perspective of innovation presented as the analyzing theory is covered by a fourth question. This is not a formal SRQ but rather an analyzing theory question (ATQ) that can be viewed as a tool with which each of the three SRQ's is studied.

ATQ: In what way does the nature of innovation influence how stakeholders define success criteria within the three dimensions of the theoretical framework?

Figure 7 represents an illustration of how the RQ, the SRQ's and the ATQ are connected to and derived from the theoretical framework.

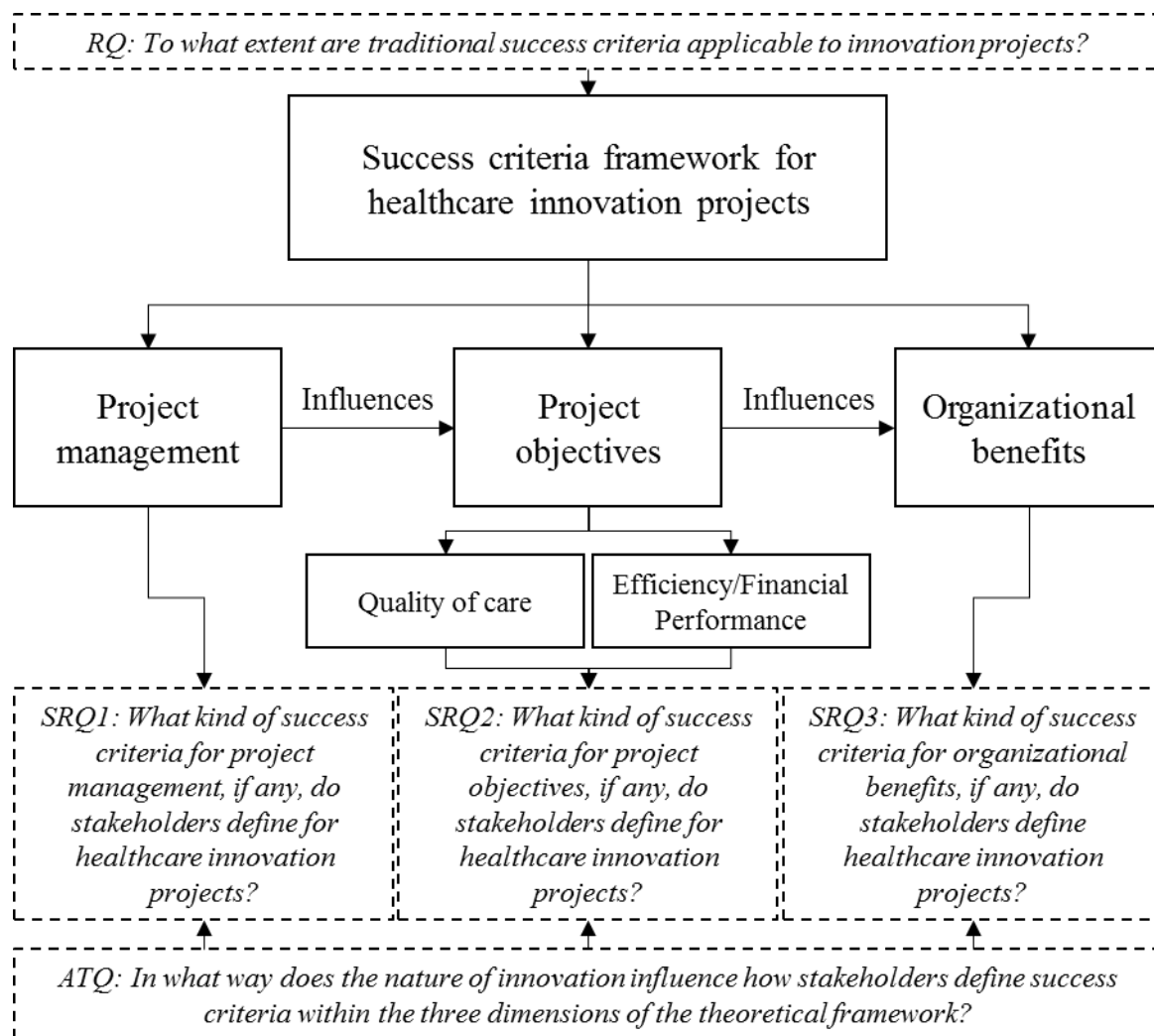


Figure 7. Theoretical framework with RQ, SRQ's and ATQ

The next chapter presents the methodology applied in this thesis.

3 METHODOLOGY

The methodology chapter starts by describing the research approach of this thesis (3.1). Following that, the data collection will be explained by presenting the pre-study and the main study (3.2). Thirdly, we will elaborate on the data analysis (3.3) and lastly we will consider research issues (3.4).

3.1 Research approach

As of the exploratory nature of this thesis and the purpose to use the theoretical framework to answer the RQ: *“To what extent are traditional success criteria applicable to innovation projects?”* the authors have appointed an abductive approach. This means a mixture of a deductive and inductive approach where theory and empirical data have been used alternately in order to provide a thorough understanding of the phenomenon (Andersen, 1998). According to Yin (2014), case studies are suitable for studying contemporary phenomenon in their natural environments with exploratory RQs, such as the one in this thesis. Stake (1995) suggests that researchers should choose cases where learning will be greatest. The introduction discussed the promising learning opportunities of this case to study the challenge of balancing PM with innovation in a project within the context of a PPP in the healthcare sector. This thesis aims to investigate different stakeholders’ perception of the importance of measurements and goals in the innovation process whereby the qualitative case studies is the best approach, as it facilitates examination of specific phenomena within a certain context, while using data from multiple sources (Baxter & Jack, 2008). A qualitative method was chosen because of its strength in generation of an intensive, detailed examination of a case – thereby avoiding too great reliance on one single approach (Bryman & Bell, 2011).

3.2 Data Collection

The data collection phase consisted of a pre-study and a main study. The pre-study had an explorative approach in order to understand the setting of the case and to identify potential research topics. The main study investigates in a more structured way the initial findings according to a theoretical framework developed during the pre-study.

3.2.1 Pre-study

The pre-study was done in combination with an extensive review and literature analysis of previous research on healthcare innovation, implementation and PM, using academic search tools, such as EBSCO, Google Scholar, JSTOR, searching methodically according to recommendations from Bryman (2012). Suitable sources were examined and used to steer the pre-study. As recommended by Creswell (2009), the authors used the snowball strategy to construct an extensive database of previous research. The database and findings of the pre-study interviews were used to formulate a theoretical framework and set the RQ for the main study. The following steps were conducted in the pre-study to understand the context of the case.

The first step of the pre-study was a presentation from a representative from the Innovation Centre on the Karolinska University Hospital's new concept of innovation partnerships and the one in particular with Philips Healthcare, comprising imaging technology. The Innovation Centre is a department within the Karolinska University Hospital and its aim is to drive innovation activities, strategically and in day-to-day work, throughout the whole organization. It is also responsible for the design of the concept of innovation partnerships. (Karolinska, 2016) The next part of the pre-study consisted of observations of the clinical practices at the prostate cancer department. A prostate cancer surgery was observed as well as a medical round, which is a weekly conference where doctors view x-rays and discuss upcoming surgeries. The authors then participated in a project workshop, attended by relevant stakeholders in the pilot project, in which the authors observed the planning of the upcoming months of the project and interacted with the participants. The results generated from the pre-study activities to this point were an identification of the project's stakeholders and an understanding of the prostate cancer patient care flow. This was followed by four unstructured interviews with the stakeholders that had been identified as relevant for the scope of this thesis. The interviewees were a urologist who is also the initiator and project manager of the project, a representative from Philips Healthcare, responsible for the partnership with the Karolinska University Hospital, and two representatives from the Innovation Centre, one actively responsible for the Karolinska University Hospital's partnership with Philips Healthcare, and one managing the Innovation Centre, and through that a major initiator of this new partnership model. The main activities undertaken in the pre-study can be viewed in the table below.

Table 7. Pre-study activities

| Activity | Participating stakeholders | Learnings |
|---------------------|--|--|
| Presentation | Representative, The Innovation Centre | Initial understanding of partnership and pilot project |
| Surgery observation | Medical staff | Initial understanding of prostate cancer patient care flow |
| Round observation | Urologists, radiologist | Further understanding of prostate cancer patient care flow |
| Workshop | Project stakeholders | Identification of major stakeholders in the project |
| Interview | Project manager/Urologist | Further understanding of project |
| Interview | Representative, Philips Healthcare | Further understanding of project, Philips Healthcare perspective |
| Interview | Representative, The Innovation Centre - responsible for Philips Healthcare partnership | Further understanding of project, Innovation Centre perspective |
| Interview | Manager, The Innovation Centre | Further understanding of project, Innovation Centre perspective |

3.2.2 Main study

The pre-study showed stakeholders' potentially different perception of goals and measurements which helped derive the RQ, whereby the main study was conducted to further investigate the topic via deep interviews, recommended by Thomsson (2010) in order to obtain detailed descriptions and reflections from involved stakeholders. The main study is based on data from 16 interviews, of which four were conducted with representatives from Philips Healthcare, two with representatives from the Innovation Centre and 10 with different types of doctors at the Karolinska University Hospital. The interviews were conducted between March 23rd and April 14th 2016. All interviews, except three of the interviews with Philips Healthcare, were conducted at the Karolinska University Hospital, at each interviewees desired location, in order to ensure a safe and calm place to increase comfort for the respondent as well as the possibility to communicate and record the interviews (Bryman & Bell, 2011). Three of the interviews with Philips Healthcare representatives were conducted via Skype as the respondents work in the Netherlands.

The interviews were semi-structured according to predefined topics related to the theoretical framework, providing space for reflections and changes depending on the development of the dialogue. An interview guideline was developed for each interview (see Appendix A. for an example) following the method of starting with writing down direct questions in need of answers followed by constructing actual interview questions that could lead the interviewee to discuss the defined topics. Each interview was scheduled for 45-60 minutes in order to give each respondent time to express personal opinions and perceptions, no matter the degree of involvement in the project (Ahrne & Svensson, 2011). Both authors were present during all interviews, allowing the multi observation method, with one person concentrating on actively leading the dialogue while the other taking notes and paying attention to mood, language details and the respondents comfort (Mayer, 2009).

3.2.2.1 Interviewee Selection

As the pre-study shed light on the potential differences among stakeholders, the interviews were conducted with the three stakeholder groups involved in the project, doctors of different medical disciplines at the Karolinska University Hospital, the Innovation Centre and Philips Healthcare. The criteria for selection of interviewees were based on the position, responsibilities and involvement in the project. In order to provide a holistic view of the different stakeholders, both operational and strategically involved stakeholders in the project were chosen as well as stakeholders only affected by the outcome of the project. 16 interviews were judged to be sufficient to answer the RQ as it ensured to cover the views of stakeholders from all groups and with different involvement in the project. In Table 8 a list of the interviewees and their role and involvement in the project can be viewed.

Table 8. Interviewees - Main study

| Citation | Title/role | Involvement |
|------------------|--|---------------------------|
| Interviewee [01] | Oncologist | Strategic |
| Interviewee [02] | Oncologist | Affected |
| Interviewee [03] | Philips Healthcare, Responsible for Partnership with Karolinska | Strategic |
| Interviewee [04] | Philips Healthcare, Developer | Operational |
| Interviewee [05] | Urologist | Operational |
| Interviewee [06] | Urologist | Operational |
| Interviewee [07] | Radiologist | Operational |
| Interviewee [08] | Oncologist | Operational |
| Interviewee [09] | Urologist | Affected |
| Interviewee [10] | The Innovation Centre, Responsible for Partnership with Philips Healthcare | Strategic |
| Interviewee [11] | The Innovation Centre, Director | Strategic |
| Interviewee [12] | Urologist | Affected |
| Interviewee [13] | Philips Healthcare, Project Manager | Strategic and Operational |
| Interviewee [14] | Radiologist | Operational |
| Interviewee [15] | Urologist, Project leader | Strategic and Operational |
| Interviewee [16] | Philips Healthcare, Developer | Strategic and Operational |

3.2.2.2 Data Documentation

Extensive notes were taken during the interviews. All interviews were recorded in audio form to be available to listen to again when needed. Directly after the interviews both authors proofread and extended the notes. Each interview was discussed, summarized and structured with thematic templates. The authors chose not to transcribe the whole interviews, as the analysis is thematic and not dependent on exact wording but rather the themes and opinions brought up by the interviewees. Markle, West and Rich (2011) argue that keeping data in its original multimedia (audio or video), instead of transcribing, can allow for greater accuracy and trustworthiness, as well as more informative reporting and thicker

descriptions. Thus, the audio files were used as the main source for the analysis and transcription only used for quotations.

3.3 Data Analysis

The data analysis followed the model of Saldana (2015) (Figure 8).

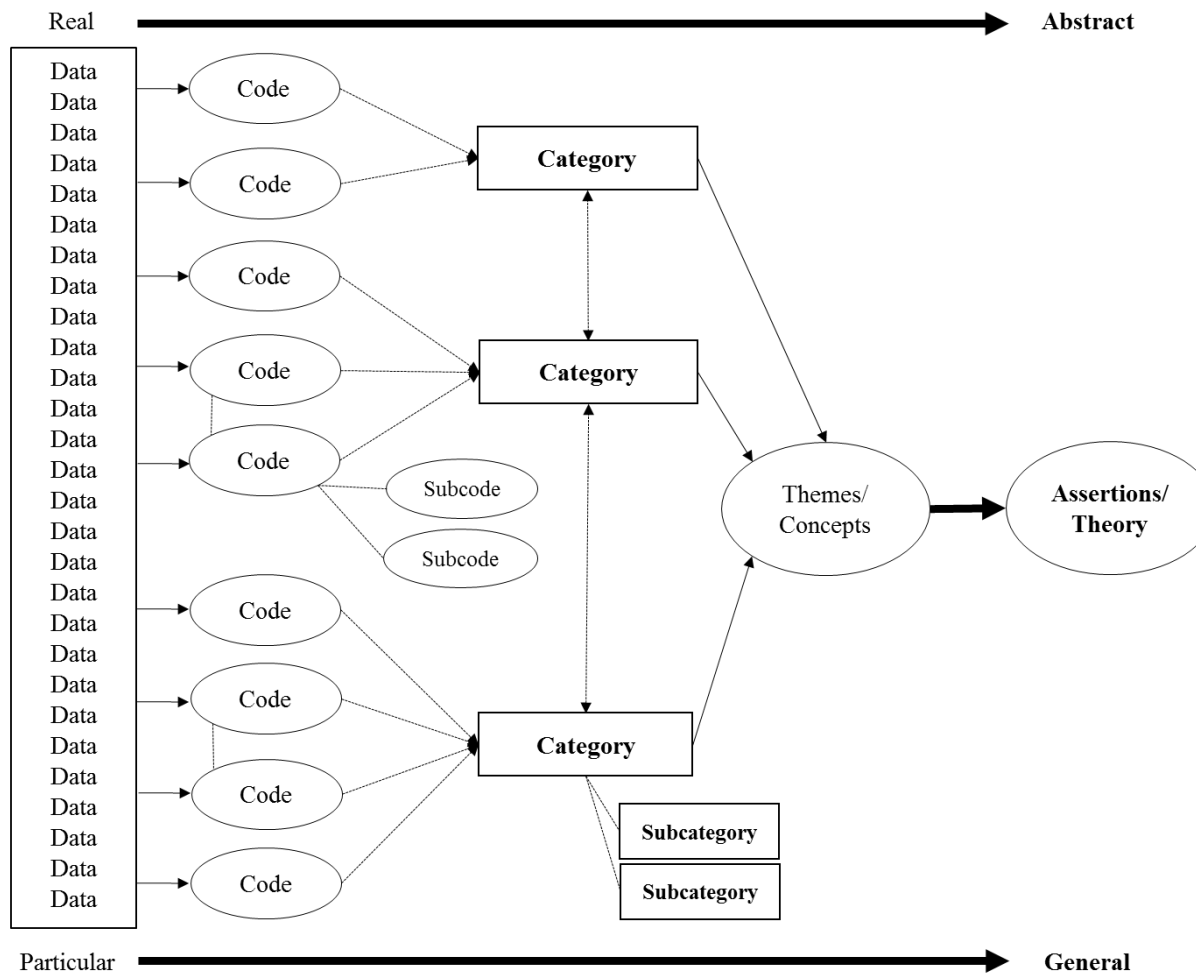


Figure 8. A streamlined codes-to-theory model for qualitative inquiry (Saldana, 2015)

Saldana highlights the importance of approaching the data from different views by using what he labels as first cycle and second cycle coding. First cycle coding concerns the process of sorting raw data in systematic order, hence creating categories of codes and subcategories, which contain comparable characteristics in one dimension or more. This has been done by classifying the collected data from the interviews into three meaningful categories derived from the theoretical framework, the PM, the project

objectives and the organizational benefits. Next step, each category was coded into sub-categories based on raw data to find patterns within each theoretical category. Saldana's second cycle of coding concerns how to create systematic themes or concepts of the categories. Creating concepts is how to reach a higher level, which is more general and abstract. The ability to show the systematic interrelation between these themes and concepts leads toward the development of theory. Through the sub-categorizing, the authors found the main themes and concepts used to develop a descriptive framework, that contributes to existing theory.

3.4 Research Issues

The most common way to assess the quality of research is to consider validity and reliability. However, many researches have discussed the applicability of these concepts in qualitative research as validity and reliability puts great emphasis on measurability. (Bryman & Bell, 2011) Lincoln and Guba (1994) mean that validity and reliability assume that it is possible to determine an absolute picture of the social reality and has therefore suggested that qualitative research should be rather assessed by the criteria trustworthiness. The authors have judged this criterion to better describe the context of the case whereby trustworthiness will be elaborated in relation to the thesis.

3.4.1 Trustworthiness

Trustworthiness consists of the four parts credibility, transferability, dependability and confirmability, which all have a counterpart in quantitative research (Lincoln & Guba, 1994).

3.4.1.1 Credibility

Credibility, equivalent to internal validity, questions how believable the findings are. Shenton (2004) means that one of the best ways to ensure credibility is to use triangulation and *"the development of an early familiarity with the culture of participating organizations before the first data collection dialogues take place."* This has been achieved by having an extensive pre-study that used different methods including observations and interviews to create an understanding of the case. To further assure credibility the authors had extensive contact with key stakeholders in the project and used respondent validation, as results from the study has been disclosed to involved parties, according to recommendation by Bryman & Bell (2011).

3.4.1.2 Transferability

Transferability, equivalent to external validity, concerns the generalizability to other social contexts and situations. As of the nature of qualitative research and case studies transferability is an issue. Geertz (1973) means that qualitative research therefore should aim at what is called “*thick descriptions*” which means rich reports of the details of a culture, as it will provide a database that others can assess the transferability of (Lincoln & Guba, 1994). The authors have chosen to interview different stakeholders, both directly involved in the project, strategical and operational, as well as stakeholders affected by the project, in order to get a rich understanding of the culture and context and thereby increase the transferability of the study.

3.4.1.3 Dependability

Dependability, comparable to reliability, is the findings likeliness to apply at other times. To deal with the issue of reliability, researches try to use techniques to show that similar results would be obtained, if the work were to be repeated with the same methods, in the same context and with the same participants (Shenton, 2004). However, as Fidel (1993) and Marshall and Rossman (1999) write, such provisions render problematic because of the changing nature of the phenomena studied by qualitative researchers. Shenton (2004) means that research should enable future researchers to repeat the work by reporting the processes with in the study in detail, however, not necessarily to gain the same results. As of this, the researches chose a method and theoretical framework that could be used to easily repeat the study. The process has been well documented in order for other researchers to review the study.

3.4.1.4 Confirmability

Confirmability refers to the independence of results and measurement from the persons that conduct the research – i.e. have the researchers allowed their values to intrude to a high degree (Bryman & Bell, 2011). Confirmability is the qualitative researcher’s equivalent concern to objectivity. Patton (1990) associates objectivity in research to the use of measurements and results that are not dependent on human skills. However, he means that real objectivity is impossible as the intrusion of the researcher’s biases is inevitable since all surveys and tests are designed by humans. Shenton (2004) highlights the importance of ensuring that the “*findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher*”. The authors have taken several measurements to ensure the confirmability. Firstly, the explorative pre-study ensured that the RQ was rather a result of the case than of preferences of the authors. Secondly, a lot of effort were put on ensuring that the questions were not biased by developing a template to find questions and verifying questions by

testing them in mock-interviews before the main study. Thirdly, all respondents were informed that there were no right or wrong answers, and that if respondents did not know or wanted to answer that was just as much an answer. Lastly, the authors used triangulation when interpreting data, which means that data was interpreted separately and then discussed to check if the authors had a shared view.

4 EMPIRICAL FINDINGS

This chapter starts with presenting general findings derived from the main study concerning the case (4.1). Thereafter, the findings concerning each of the three SRQ's are outlined ('Project management' (4.2), 'Project objectives' (4.3) and 'Organizational benefits' (4.4)). Finally, findings concerning the ATQ are presented (4.5).

4.1 The Case and the Stakeholders

This section presents the case of the thesis. Based on the findings from the pre-study we illustrate the prostate cancer care flow and the aim of the project followed by a description of the stakeholders involved.

Prostate cancer is the most common cancer form in Sweden and primarily affects older men. Patients have good chances of cure by surgery or radiotherapy if the tumor does not extend outside the capsule of the prostate. However, both treatments entail considerable risks for complications of urinary incontinence and erectile problems that can significantly affect patients' quality of life. To lower the probability of side effects it becomes very important to locate the exact position and severity of the tumor. This information makes it possible to consult the patient about proper treatment as well as to develop a strategy before surgery or radiation. Figure 9 visualizes the prostate cancer care flow.

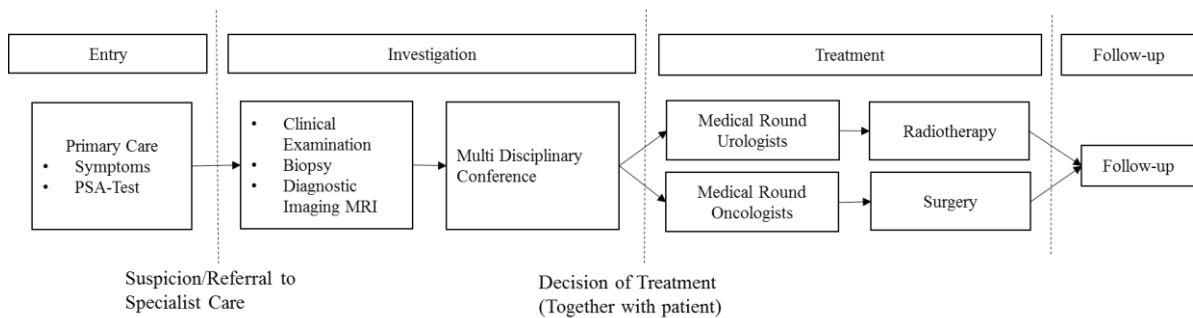


Figure 9. The Prostate Cancer Care Flow

Prostate cancer is discovered in the primary care most commonly via routine checks or patients' wish to perform a blood test. The patient will get a referral to specialist care if doctors suspect prostate cancer.

Next step is to investigate and diagnose. At the Karolinska University Hospital, the patient's case is discussed in multidisciplinary rounds — a conference where representatives from the relevant medical specialties discuss the particular case and share knowledge and experiences in order to make better decisions about which treatment to recommend to the patient. The first round takes place after the patient has been diagnosed with prostate cancer and aims to clarify pros and cons with the different treatments. Urologists share their view of performing surgery and oncologists do the same for performing radiation therapy. The second round takes place after a decision of treatment has been made and is attended by the relevant doctors for that particular treatment (surgery – urologists, radiation therapy – oncologists). The purpose of this round is to share knowledge among the specialists and to develop a strategy that minimizes side effects.

Today the processes of developing strategies for treatments are administratively heavy, old-fashioned and erratic. The urologist responsible for value-based healthcare at the department for prostate cancer has identified potential improvements that could be achieved by using an information system that displays and share information in a more structured and efficient way. The Karolinska University Hospital together with Philips Healthcare will develop a prototype digital platform used to store all information about prostate cancer patients. This means that test results, journals and comments from all different doctors in contact with the patient will be stored in the same system, including urologists, oncologists, radiologists and pathologists. Among the benefits the information system is anticipated to contribute towards are less administrative work, more efficient rounds, more structured decision-making and easier communication with patients.

The project lasts for a year and involves different stakeholders. The stakeholders can be categorized into three groups. The first one is the Karolinska University Hospital and within that group there are several stakeholders in terms of the project manager and doctors from different medical disciplines (urology, oncology, radiology). The two other stakeholder groups are Philips Healthcare and the Innovation Centre. A description of all the stakeholders and their interest and involvement in the project is viewable in Table 9.

Table 9. Stakeholders

| Group | Stakeholder | Description | Interest | Involvement |
|---|---|--|--|---|
| The Karolinska University Hospital | Project Manager | Responsible for value-based healthcare at the department for prostate cancer. | Identified the need for the innovation. | Responsible for leading and planning the work. |
| | Urologists | Specially trained to treat problems affecting the urinary tract (kidneys, ureters, bladder, urethra) and will perform surgery. | Participate in the multidisciplinary conferences and will use the information platform in daily work. | Representatives are both urologist that have participated in project workshops as well as urologist with will be affected, but have minor involvement in the project process. |
| | Oncologists | Oncologist specializes in the use of radiation therapy to treat cancer and will perform radiation therapy. | Participate in the multidisciplinary conferences and will use the information platform in daily work. | Representatives are both oncologists that have participated in project workshops as well as oncologists that will be affected, but have minor involvement in the project process. |
| | Radiologists | Radiologists specialize in diagnosing and treating diseases and injuries using medical imaging techniques, such as x-rays, computed tomography (CT), magnetic resonance imaging (MRI). | Radiologists analyses MRI-images, participate in the multidisciplinary conferences and will use the information platform in daily work. | Representatives participate in project workshops to give input and feedback. |
| Philips Healthcare | Imaging Technology Department | Philips Healthcare is the private company that the Karolinska Hospital has initiated a partnership with. Their role is to develop the technology according to agreements between the stakeholders. | Philips Healthcare wants to understand demands from the healthcare sector, develop and validate technology in order to create products that can be sold in the marketplace | The participating individuals are system analysts specialized in prostate cancer treatment, the project manager for the information system at Philips Healthcare and the strategically responsible manager for the partnership with the Karolinska University Hospital. |
| The Innovation Centre | Responsible for partnership with Philips Healthcare | The Innovation Centre is a unit at the Karolinska University hospital dedicated to enable co-creation between industry, academia and healthcare. | In general interested in driving innovation activities at the hospital, strategically and in day-to-day work. Also initiator of the partnership model and therefore interested in learnings. | Takes an active role in facilitating the project and participates in workshops and communication between Philips Healthcare and medical staff. |

The empirical findings will continue by presenting the results from the main study according to the three SRQ's and the ATQ presented in 2.3.

4.2 Project Management

This section presents the empirical findings relevant for answering our first SRQ: *"What kind of success criteria for project management, if any, do stakeholders define for healthcare innovation projects?"*

With the theoretical framework as a foundation we set out to research what kind of PM criteria stakeholders identified as appropriate for innovation projects. Four major themes were identified. The first one was a difficulty in separating between criteria for PM and project objectives. Secondly, elements from the iron triangle were mentioned rather rarely. Thirdly, stakeholder satisfaction was the most frequently occurring PM criteria. And finally, we identified a general scepticism to PM criteria from some interviewees.

We found that several interviewees, primarily doctors, perceived a difficulty in separating between criteria for PM and criteria for project objectives, and found it challenging to define PM criteria not derived from the project objectives. For example, one interviewee first responded that the PM process should be evaluated on if the project objectives had been reached:

“It’s simple, if we have a target and we have reached that target, then we know that it works well. Then we can use the same approach in other projects.” /Interviewee[08]

But when a follow-up question was asked if a project could fail in reaching its target but still have had a successful execution and management process, the interviewee responded:

“Yes, absolutely, that happens sometimes. Sometimes you don’t reach the targets but the methodology and execution have been good so you can apply those to other projects that you may reach the targets for.” /Interviewee[08]

Similarly, one interviewee started off by claiming if a project has reached its objectives the execution and management had been successful, but when provided with examples on projects that might fail despite successful PM because of unexpected, external factors, responded:

“So then you should not base it on the results, only the methodology? Then I guess you can talk to people to see what they think during the project.” /Interviewee[09]

However, the conceptual distinction was not as challenging for all respondents. For instance, one interviewee, with experience in PM, accurately made a distinction between PM and project objectives, as well as defined the factors of time, cost and quality of the iron triangle as examples of PM criteria:

“You always have two things, the project has a few parameters: ‘are we on time?’, ‘how much budget did we spend?’, ‘what is the quality that we deliver?’ And of course you have the product that also needs to meet the requirements and I think that’s the second kind, and those have their own KPIs.” /Interviewee[13]

Another interviewee, also with experiences from PM, initially found it challenging to define how exclusively the PM process could be evaluated because of projects in general being unique, but eventually also expressed factors from the iron triangle:

“You want to estimate if one project is better than another one, rank them in some way, how to find a system that normalizes and maps them? I believe all projects basically have unique targets and in many cases unique participants. The standard way would be, in all

projects, to track time, costs, resource consumption and if you have completed the intended scope.” /Interviewee[10]

Except for in these two examples the cost and quality perspectives from the iron triangle did not appear. The time factor was expressed by a few more interviewees, for instance:

“Could measure the time used for administrative tasks.” /Interviewee[05]

Instead of the traditional elements from the iron triangle, the most common theme for assessing the PM process involved asking for project participants’ opinion about the process, as expressed by Interviewee[09] above. Below are a few additional examples:

“You could measure satisfaction by having people tick smiley faces in surveys.” /Interviewee[05]

“Look at the project plan, everyone is still satisfied, that’s good!” /Interviewee[10]

“I would say that if all parties in the project are satisfied, then the management and execution of the project must have been quite good. Even if you haven’t reached a target. I think that would be a good receipt.” /Interviewee[15]

The fourth theme identified was a perceived challenge, or even a scepticism, towards measuring PM criteria because of projects being unique with unique participants, as expressed by Interviewee[10] above. A similar view for this particular project was expressed by Interviewee[07] when asked how the PM process can be measured:

“Difficult to answer because this project does not have a clear structure. If the project succeeds depends more on the personalities involved [...] I have not seen that this project is executed according to a specific process, it’s more of a work group.” /Interviewee[07]

One interviewee expressed an explicit difference between traditional PM and innovation projects and claimed the latter is more based on a unique situation and therefore depends on the people involved:

“In traditional project management you have process measurements: how many red flags have there been during the project etc. In this work (innovation projects) the difficult part is balancing the creative problem solving phase and the execution phase, and that is damn situation dependent [...] I was discussing with an innovation manager from Johnson & Johnson the other day, they also have a similar innovation hub (similar to the Innovation

Centre). In their hub the word ‘process’ is forbidden. That is not so crazy. It’s a lot more about having the right people.” /Interviewee[11]

The four major themes identified in the PM dimension of the theoretical framework and presented above have been summarized in Table 10.

Table 10. Summary of empirical findings - Project management

| Theme | Description |
|---------------------------------------|--|
| Separating PM from Project objectives | Some interviewees faced difficulties defining criteria for PM not derived from Project objectives |
| Iron triangle | The perspectives of the iron triangle were rarely mentioned. Time was mentioned a couple of times. Cost was mentioned 1-2 times. |
| Stakeholder satisfaction | Stakeholder satisfaction was the most frequently mentioned theme for measuring PM |
| Scepticism to measuring PM | Some interviewees expressed concerns and negative aspects associated with attempting to measure PM activities |

4.3 Project Objectives

This section presents the empirical findings relevant for answering our second SRQ: *“What kind of success criteria for project objectives, if any, do stakeholders define for healthcare innovation projects?”* It will be divided into two parts with the first presenting examples of the main improvements stakeholders of the project anticipated (4.3.1). The second part will then illustrate how stakeholders expressed these improvements could, or could not, be measured (4.3.2).

4.3.1 The Project Objectives

Reviewing our theoretical framework and the project objectives dimension, many interviewees discussed the objectives of the project in both sub-dimensions of QoC and Efficiency/Financial performance. An emerging theme was that interviewees first or mainly highlighted the potentials for improvements on QoC criteria of the project but Efficiency/Financial performance were also quite extensively discussed. A quite clear pattern among the QoC criteria mentioned was the traditional aims of prostate cancer treatment, removing the whole tumour while minimizing side effects such as urinary incontinence and erectile dysfunction, and how this project could contribute towards improving these. However, interviewees expressed different ways they anticipated the project would lead to these QoC improvements. For instance, through better utilization of data, shorter lead times for patients or better

cooperation between doctors from different medical disciplines. Below is an example of an interviewee who anticipated the project to lead to a more structured usage of data as well as better cooperation.

“This is one project that could streamline and improve the multidisciplinary conference, by making the meetings more prepared instead of like now when people sit and flip through some papers, and it’s a bit uncertain and no one has seen the patient, that’s no good. It requires quite a lot to make these multidisciplinary conferences good.” /Interviewee[01]

When asked to elaborate on which improvements this could further lead to the interviewee expressed how the patients would be affected by this new way of working:

“Partly I believe the patient receives a better assessment, and that all patients are discussed, that’s very important [...] And I believe it promotes cooperation in another way, and that I believe is one of the most important parts of multidisciplinary conferences. That might become less important if you work more closely together. But it can be a good starting point in order to get that way of working to emerge in a good way.” /Interviewee[01]

This interviewee expressed two ways that could lead to the patients receiving a better assessment and treatment. First, by making the multidisciplinary conferences more structured the quality of the discussions and decisions could be improved. Secondly, by improving the cooperation between doctors from different medical disciplines with different competences the patients will also indirectly benefit. Another interviewee similarly expressed how the project could lead to a higher quality assessment by better accessing and utilizing patient data:

“There will be less uncertainty, I believe. If I can access all x-ray results etc. then the information will be easily available and you can together with the patient walk through it. Or before the conferences not have to sit and guess what different examinations have shown or how things have developed over time.” /Interviewee[05]

Another interviewee used a current situation example in order to illustrate how the decision making process could be improved through a better utilization of data:

“In a conference situation, where we are sitting several doctors and I or [name of other radiologist] is presenting a case and we’re supposed to make some kind of decision and some information is missing. Then we might, because we don’t have that information at

hand, not be able to make a good decision, or a complete, informed decision. Then (with the new system) we have that there, we can just click on it.” /Interviewee[14]

Other interviewees also expressed that the project had potential to improve the QoC delivered to patients, but rather by shortening the time the patients have to wait before moving forward and receiving treatment in the care flow.

“They (patients) receive treatment at the correct time, no need to lose so much along the way. Lead times as we usually talk about. How much can we save from first symptom to treatment” /Interviewee[02]

These quotes above come from doctors of different medical disciplines. Also representatives from Philips Healthcare expressed similar expected improvements:

“What we try to do in this project is to have more structured data, across the disciplines, to allow that in the multidisciplinary teams it is easier to access (the data) but also easier to come to a decision towards the treatment.” /Interviewee[13]

Interviewees also expected the project to lead to different kinds of efficiency improvements that can be viewed as Efficiency/Financial performance in the theoretical framework. A quite concrete example of one expected efficiency improvement is provided below:

“You can shorten the time it takes to update the quality register and other registers as well [...] I don’t know how long time that takes today but I know that there are double or triple systems to work with today so if you can take away only one of those steps you’ve accomplished an awful lot.” /Interviewee[11]

Another interviewee shared this view:

“And then it will be faster. We will become more efficient. We will save a ton of time by avoiding a lot of what we are talking about here, double registration.” /Interviewee[14]

Even though many interviewees expressed expectations on some kinds of efficiency improvements the answers were in general not addressing one particular process that was expected to be improved. Instead, it was rather an overall expectation that many kinds of processes would in different ways become more efficient but in exactly what way was rarely specified.

A difference among the interviewees was how they discussed the linkage between the Efficiency/Financial performance and the QoC improvements. Some made a quite clear distinction

between the two kinds of improvements, as in our theoretical framework, by first discussing the patient-related QoC improvements they saw, and then moved on to discuss the Efficiency/Financial performance. For instance, one Philips Healthcare representative (Interviewee[04]) made the same distinction that exists in the theoretical framework and referred to the different kinds of improvements as ‘Quality of care’ and ‘Efficiency’. Discussing the different types of improvements expected, others anticipated that Efficiency/Financial performance could lead to QoC improvements. Below is an example of an interviewee that expressed a perceived interlinked relationship between the two kinds of improvements:

“More efficient processes in the organization, savings due to these more efficient processes, often connected to the multidisciplinary conferences. And that in extension will lead to better treatment, more secure and better treatment basically.” /Interviewee[10]

Another interviewee found it challenging to distinguish between what kind of improvements the project aimed towards but believed it had potential to affect both when asked if the project was aimed mainly towards creating value for patients (QoC) or for the hospital (Efficiency/Financial performance):

‘I cannot answer that but my perception is that it (the project) will actually affect both. It will affect efficiency and confidence for the doctors in this care flow but it seems very likely that it will also affect the outcome for the patients.’ /Interviewee[03]

One interviewee mainly highlighted the improvements in Efficiency/Financial performance that potentially could affect the QoC criteria indirectly. In this example the interviewee has first explained expectations on Efficiency/Financial performance and was thereafter asked if the project can also create value for the patients as well:

“It’s a bit difficult to see right away but primarily it should make our work with the patient easier. Perhaps the patient will come into the pipeline faster for surgery and treatment and those things.” /Interviewee[12]

In the next section we will elaborate on how interviewees anticipated these project objectives could, or could not, be measured and after that the major themes identified concerning project objectives will be summarized.

4.3.2 Measuring the Project Objectives

As no concrete success criteria, parameters, KPIs or other kind of measurements exist for the project this section will focus on how stakeholders in the project have expressed how the project objectives could, or should, be measured and evaluated. This section will outline the most frequently occurring themes that stakeholders mentioned as potential measurements for both QoC and Efficiency/Financial performance.

When it comes to measuring some traditional QoC parameters, such as survival rate for instance, there was a unified view among the interviewees that it would not be feasible within the one-year time frame of the project.

“For quality of care measurements in oncology you need 10-15 years [...] surgery you can do a bit more within a bit shorter time frame.” /Interviewee[04]

Instead, interviewees discussed other kinds of measurements that can be considered indicators of more long-term QoC measurements. One interviewee made a clear distinction between two kinds of QoC measurements:

“PROM stands for patient related outcome measures, outcomes are side effects such as incontinence, impotence and of course oncological data [...] PREM is patient related experience measures, that are questions like ‘have you received good information about side effects?’ ‘Do you feel involved in the process?’ That kind of questions to the patient.” /Interviewee[09]

Some kind of measurements on patient experience and satisfaction were expressed by several interviewees. One interviewee even expressed this as the most important kind of QoC measurement:

“How satisfied are the patients? How are the patients feeling? How much troubles do they have because of their incontinence or impotence? That’s a quality indicator too, patient satisfaction and how the patient is feeling that actually is the most important part of what we’re doing here.” /Interviewee[14]

Above we noted that most interviewees expected Efficiency/Financial performance but often could not specify an exact process and how that would become more efficient. The same observation could be made when asked how these potential efficiency improvements could be measured. The most common suggestions were measurements that not clearly only assessed QoC or Efficiency/Financial performance criteria but rather could be considered to have a direct or an indirect effect in both sub-dimensions. For

instance, several interviewees mentioned measurements concerning the internal conferences where patients' cases are discussed:

“That we actually discuss the patients that should be discussed during the multidisciplinary conference [...] There are especially more patients that should be discussed that are not discussed today.” /Interviewee[01]

“Measure the time for the conferences and how confident they (doctors) feel about their decision” /Interviewee[03]

“Participation (= the patient's case is discussed) in multidisciplinary conference, that's another measurement you could use. That should increase to 100%, if I've understood correctly, if this system is used” /Interviewee[09]

The kind of measurements exemplified above can be argued as both QoC and Efficiency/Financial performance criteria. In one way, they are addressing the efficiency of an internal process at the hospital. In another way, it is not unreasonable to claim having one's case discussed in these kinds of conferences can potentially improve the assessment and treatment a patient receives. Therefore, it can also be considered a QoC criterion.

Lead time was another example that can be considered both a QoC and an Efficiency/Financial performance criterion:

“Perhaps you should be able to measure lead times as well, that is how long time it takes for the patient if you now can enter everything digitally.” /Interviewee[09]

A faster process between different steps in the care flow can definitely benefit patients and can thus be considered a QoC criterion. However, the reason it becomes a benefit for patients is because internal processes in the hospitals have become more efficient and can therefore also be viewed as Efficiency/Financial performance.

The two major findings concerning the project objectives and how to measure them have been summarized in Table 11.

Table 11. Summary of empirical findings - Project objectives

| Theme | Description |
|---|--|
| Overlap QoC and Efficiency /Financial performance | Interviewees differed in describing how connected QoC and Efficiency /Financial performance criteria are |
| Two kinds of QoC criteria | A difference was identified between long-term (Mortality, Survival rate) and short-term (for instance PREM) QoC criteria |

4.4 Organizational Benefits

This section presents the empirical findings relevant for answering our third SRQ: *“What kind of success criteria for organizational benefits, if any, do stakeholders define for healthcare innovation projects?”*

We present how interviewees’ answers can be categorized according to the five performance objectives in the theoretical framework. Interviewees were both asked what beneficial outcomes for the organization they expected in general as well as more concrete questions about each of the performance objectives. For instance, how they expected the quality of the work the organization performed would be affected by the project. This section will also present additional organizational benefits not connected to any of the performance objectives but still mentioned by interviewees.

Across all the interviewees there were expectations of positive effects on all five performance objectives. Quality, speed and dependability were the ones interviewees most frequently expected an improvement on if the project would be successful. These three performance objectives were often overlapping, for instance by improving the speed or dependability the quality would automatically increase as well. Below is an example of this overlap when an interviewee was asked if the project could improve the dependability of the organization:

“Yes, that we’ve already discussed as well. You don’t have to sit and read papers and interpret, instead the things (the data) will be extractable from a database.”
/Interviewee[09]

When asked about dependability this interviewee felt we repeated the question about quality, since according to this interviewee the two concepts are so interlinked.

Flexibility was the performance objective interviewees found the most challenging, both in terms of defining exactly what it would mean to the organization and to come up with examples of how the project could improve it. In several interviews the interviewers had to elaborate on the terms range and response flexibility to explain the concept of flexibility to the interviewee. Even after having the

flexibility concept explained several interviewees responded organizational improvements that not directly can be categorized as flexibility, for instance:

“We could become better in handing over the aftercare to other units [...] sometimes we have a tendency to hold on to the patients.” /Interviewee[06]

The interviewee suggested an improvement on something the organization already is doing. While this may be a valuable organizational improvement, it cannot be directly connected to range or response flexibility. It is not an increase in the number of activities the organization can do (range) and it is not an improvement on the ease of which the organization switches between different activities (response). This is rather a matter of speed. By shortening the time the prostate cancer department holds on to patients that actually could be handed over to another unit for the aftercare.

For the performance objective of cost, most interviewees had positive expectations but some chose not to answer because they considered their own knowledge about the organization's cost structure too limited. Of those that answered some expressed cost reductions related to the Efficiency/Financial performance discussed earlier. Others believed the project could lead to cost reductions but were not sure these reductions would be distributed to the organization. Instead, because of how the Swedish healthcare sector is structured, the project could contribute towards societal cost reductions.

“It is a saving at the core, and that should be shown in quality and therefore also in savings in that we are doing things better, either that we are allocating resources in a better way, and through that get a better result so there is a saving for society in general. But if there will be a saving for the clinic in itself that will show I am not so certain about.” /Interviewee[15]

A similar analysis was provided by another interviewee, about the relationship between quality and cost in healthcare organizations when asked if there were any conflicts or paradoxes between any of the five performance objectives:

“I believe healthcare is a bit special concerning that. Here you almost de facto have that good quality leads to lower costs. There is a connection between that, it is not as in a manufacturing industry for example. Here you have that good quality in the initial care will lead to fewer re-visits, for example, or that you need less rehabilitation.” /Interviewee[11]

These statements indicate the connections and trade-offs between the performance objectives may be different in healthcare organizations compared to many other organizations.

A theme identified was organizational improvements that cannot be categorized according to the five performance objectives. One improvement that came up in several interviews was an expectation of an improved network and collaboration ability, both internally and externally. The internal effects have been mentioned briefly in a previous section as an expected improved cooperation between doctors from different medical disciplines. This was also brought up as a long-term organizational improvement:

“A side effect is that when we sit down and work together we break down structures. We get a lot of things that are not measurable. Increased understanding of each other, formal and informal contacts.” /Interviewee[07]

Building this kind of network may have positive effects on the organization but it cannot be connected to a specific performance objective. One could for instance argue that by achieving a better understanding of the competencies of doctors from other medical disciplines the quality of the care provided can improve. Another reasoning may be that with lower structures and boundaries between different units a lot of processes will become more efficient, thereby affecting speed. Some interviewees also expressed these kinds of networking effects externally, between representatives from the hospital and Philips Healthcare.

“You also become better in cooperating with external parties” /Interviewee[11]

The quote above is from a representative from the Innovation Centre. Also Philips Healthcare representatives expected these kinds of organizational benefits for the hospital:

“There are other kinds of value. They will get access to our experts and that will hopefully have a value for the staff [...] can have value in that they build up know-how etc.” /Interviewee[03]

In general interviewees had a difficult time outlining measurements for the organizational dimension which is further discussed in the next section which presents empirical findings related to the ATQ. The major themes of the Organizational benefits section can be viewed in Table 12.

Table 12. Summary of empirical findings - Organizational benefits

| Theme | Description |
|--|---|
| Interlinked and overlapping performance objectives | Interviewees identified clear overlaps among several performance objectives. Primarily quality, speed and dependability |
| Relationship and networking effects | Interviewees identified networking and relationships as organizational benefits that cannot be connected to a performance objective |

4.5 Innovation

This section presents the empirical findings that are relevant from the perspective of our analyzing theory on innovation and the ATQ. These findings will then assist in answering our three SRQ's in the analysis chapter.

Several interviewees expressed concerns that can be considered as some kind of risk of attempting to measure innovation. Here is one example from an interviewee who expressed that attempts to quantify measurements too early should be avoided:

“As soon as you start putting numbers on something, then you believe you have done a more thorough job than you can reasonably have done.” /Interviewee[11]

Later in the same segment the interviewee continued on a similar note:

“Here we are working with quite high uncertainty, and to try to apply the methods that work under low uncertainty, that just goes wrong” /Interviewee[11]

Below is an example of another interviewee that discussed the same topic with an example:

“If there is a distortion so that something is viewed as a failure because you measured something, something tangible for instance, but since you didn't get that deliverable, you failed. But instead you got three PhD students and a lot of relationships that became the foundation for a later innovation that we can't even see.” /Interviewee[03]

In the quotes above Interviewee[03] exemplified the same idea Interviewee[11] expressed by providing an example of a project that was considered a failure because it did not reach a certain measurement point, even though the project was a success in other aspects in terms of generating PhD students and valuable relationships. The same idea Interviewee[03] expressed with the example above was summarized by one interviewee when asked if there were any risks or negative aspects of putting up measurements for these kinds of projects:

“The only negative part could be that you stop the project, because it is not delivering what you expect out of it.” /Interviewee[16]

Another interviewee made the same point and emphasized that innovation projects may differ from other projects in this sense:

“It depends on how strict you will be evaluated on target achievement. You should probably be a bit humble about the nature of innovation projects as well, we are going to learn a lot, that’s important.” /Interviewee[10]

The interviewee expresses that achieving predefined targets may not be the only goal of innovation projects, in this example learning a lot is an important part as well. The quotes above are from interviewees with experience from working in and managing these kinds of innovation projects and processes but also interviewees with primarily a medical specialization expressed similar thoughts:

“It is very dangerous to calculate points and make these quite complicated evaluations because there may be so many factors around that makes it into an actually very unfair way of measuring.” /Interviewee[09]

In the example above the interviewee expressed risks of the same kind Interviewee[11] discussed above, about attempting to quantify to an excessive extent.

A second theme of concerns relating to measuring innovation was the challenge of isolating the project’s impact on the organization and assessing that with relevant and reliable data. The quote below highlights some challenges when it comes to isolating the impact from the project, especially when attempting to measure the more long-term, organizational effects:

“The challenge is there are so many other organizational changes going on, on the low level like this project and on the high level with New Karolinska [...] our organization is very dependent on the people working in it. If people quit, it will affect the organization a lot more than in other places.” /Interviewee[05]

The interviewee expressed a perceived complexity of the organization with many long-term changes and restructurings going on and a high dependence on its people, which make it challenging to assess the impact of a single project with specific measurements.

Several interviews expressed that in order to define a measurement parameter and put a target on it there has to be a baseline to compare with. However, one interviewee highlighted that part of the reasoning behind introducing the information system this project aims to develop, is to be able to gather and track

data in a way that is not possible today. In this example the interviewee talks about this based on what another project member with better knowledge on the hospital's data status had said:

"He is not fully aware if every patient has the level of data consistency and quality that is required to set this baseline and that is why one of the first deeds (of this project) is to get a standardized data collection." /Interviewee[16]

Based on this statement many of the improvements stakeholders expect from the project would not be reasonable to assess as reliable data for establishing a baseline does not exist.

The third identified theme concerning risks or negative aspects of measuring innovation is concerning the cost and effort required for measuring. Some interviewees expressed measuring requires some sort of work and that needs to be considered. Below is an example:

"If the cost of measuring it very high. There is always something negative about being accused of too much overhead and such, not enough action. There is a reason that not until a certain level you introduce project managers and project management offices." /Interviewee[03]

One of the final interviews was with the project manager who on the one hand would have liked to see measurements, targets and a baseline established, but explained the reason that had not been set up was mainly a lack of resources. On the other hand, the project manager could also see some benefits of not having measurements and targets defined at project initiation.

"I would perhaps have preferred that we set up goals, had some people constructing the survey, doing time measurements, it would have been nice to do it that way. But now you need to do it a bit more ad hoc and I can see certain benefits with that as well because you can adjust the target measurements based on how the project goes and which parts of the project move forward." /Interviewee[15]

What the interviewee expresses here is that in an ideal world there would be a team working on setting up appropriate targets and assessing the current baseline but due to lack of resources that was not done. However, as the project addresses several improvements it also works well to wait with defining measurements and targets, because there is uncertainty in exactly which improvements will be realized. This interviewee also made a clear distinction between the risks of measurements and targets for project objectives and PM. The quote above was part of the answer to a question concerning risks and negative

aspects with targets on project objectives. The quote below is the interviewee's response to the same question but on PM measurements and targets:

"I am afraid that it would become a time thief, those kinds of targets. Because it will ultimately be very dependent on the people involved in the project, if they will drive it in that way or if they won't do so." /Interviewee[15]

Notice the difference on how the interviewee expressed a preference for measurements and targets on project objectives, but was still fine without them, compared to on PM where the interviewee was directly sceptical to targets and measurements.

In Table 13 the main empirical themes identified for innovation can be viewed.

Table 13. Summary of empirical findings – Innovation

| Theme | Description |
|---|--|
| Risks of measuring uncertainty | Interviewees defined risks with measuring too early such as missing other values and terminating promising projects due to uncertainty |
| Issues isolating the project's impact on the organization | Some interviewees expressed how it would be challenging to isolate the project's impact on the organization from other factors |
| Cost of measuring | Some interviewees indicated that measuring is associated with a cost of developing measurements, collecting baseline data etc. |

5 ANALYSIS

The analysis addresses how the empirical findings (4) answer the three SRQ's. SRQ1, concerning the Project management dimension of the theoretical framework, is answered in 5.1. SRQ2, concerning the Project objectives dimension, is answered in 5.2. SRQ3, concerning the Organizational benefits dimension, is answered in 5.3.

5.1 Project Management

This section addresses how the empirical findings in 4.2, concerning the first SRQ: *“What kind of success criteria for project management, if any, do stakeholders define as appropriate for healthcare innovation projects?”* can or cannot be answered by the empirical findings in 4.5, concerning the ATQ.

Few interviewees thought of PM as an independent process to monitor and evaluate. In general, interviewees experienced trouble separating criteria for PM from project objectives and started discussing evaluating the project objectives even though explicitly asked to only consider the PM process. Of the criteria discussed specifically for PM some elements from the iron triangle and stakeholder satisfaction occurred most frequently.

Time was the aspect of the iron triangle most often mentioned as relevant to measure. However, most interviewees referred to measuring time as the amount of it invested in the project and many doctors were concerned that projects might steal time that could be used to treat patients. This indicates that measuring time is rather a process of measuring resources spent or “cost” according to the definition of the iron triangle, as its concept of time is more associated with finishing activities according to deadlines. In addition, as this project is limited to one year, regardless of the progress at that time, the applicability of the time perspective of iron triangle becomes questionable, as this project, by how it is set up, cannot miss its deadline. The quality perspective of the iron triangle for PM was rarely discussed and even when mentioned it could be argued what the interviewee expressed can rather be connected to the project objectives.

“Whether the product meets the requirements in terms of no errors and no defects.”

/Interviewee[13]

These findings have us conclude that the perspectives of the iron triangle are of limited usefulness for evaluating PM for innovation projects.

One criteria more frequently brought up was stakeholder satisfaction. However, it was also frequently mentioned how unique the project was and how it did not follow any particular project process but was rather dependent on the personalities involved. This means that evaluating PM by the criterion of stakeholder satisfaction becomes rather pointless, as whether the reason the people involved in one particular project are satisfied is driven by the interactions between the people and not by the PM process. A project like this with high stakeholder satisfaction will only indicate the stakeholders of the particular project were satisfied but not say very much about what about the PM of the project was successful. Instead we point to the confusion of success criteria and success factors to be the reason stakeholder satisfaction was expressed as important by interviewees. When explicitly asked about the PM process interviewees tended to answer what was important to reach success, in line with Cooke-Davies' (2002) definition of success factors. Among the most common answers were top management support, structure and progress. All of these can be linked to Pinto and Slevin's (1987) Ten Success Factor List and indicates there is a challenge to separate the concepts of success factors and success criteria for practitioners as well, and not only for researchers as discussed earlier in this thesis.

Based on our findings limited support has been found for measuring PM in innovation projects as the projects do not follow a particular process appropriate to evaluate, but are rather dependent on the people involved. Some interviewees even expressed scepticism towards measuring PM for innovation projects of this kind. Reasons for this scepticism were for instance that measuring PM would just become a time thief and that the concept process is not suitable to describe innovation. Therefore, we answer the first SRQ by claiming stakeholders do not define appropriate success criteria for PM for healthcare innovation projects. We also conclude that the reason for this can in several aspects be connected to the empirical findings from our ATQ, for instance stakeholders expressed this project is not executed according to a specific process, which is in line with Kline and Rosenberg's (1986) argument that innovation is not a smooth linear process and that no specific progress deadlines had been set up, which can be connected to both the uncertainty of innovation (Perrin, 2002) and the time frame of evaluation (Drucker, 2002).

5.2 Project Objectives

The second section of the analysis addresses how the empirical findings in 4.3, concerning the second SRQ: “*What kind of success criteria for project objectives, if any, do stakeholders define for healthcare innovation projects?*” can or cannot be answered by the empirical findings in 4.5, concerning the ATQ.

As presented in 4.3, the appropriateness of dividing QoC and Efficiency/Financial performance criteria varied in interviewees’ responses. While some explicitly made the same distinction several stakeholders discussed the project’s potential outcomes in a way that could be argued for them being both QoC criteria and Efficiency/Financial performance criteria, for instance more efficient conferences could lead to better and faster decisions because of better utilization of data. This finding points towards that in the setting of our case it is often challenging to allocate a specific improvement to either QoC or Efficiency/Financial performance. Instead, there seems to often be a linkage between an improvement in QoC and Efficiency/Financial performance. In the empirical chapter we saw examples of this anticipated linkage from stakeholders. For example, savings and more efficient conferences could lead to securer and more structured discussions and by extension better decisions concerning patients’ treatment. We therefore conclude that the division between QoC and Efficiency/Financial performance made by Agarwal et al. (2010) is a useful theoretical way of considering different kinds of impact healthcare innovation project may have, but that there often is a linkage between the two kinds of improvements and projects may often address both.

Next the analysis brings us into the sub dimension of QoC. In the theoretical framework’s QoC sub dimension, derived from Agarwal et al.’s (2010), there is no division between different kinds of QoC criteria. Instead factors such as Mortality and Vaccination rates are listed together with Patient satisfaction. The analysis of our empirical findings found that there could be a division between two different kinds of QoC criteria. For instance, one interviewee referred to the two different concepts of PROM and PREM. Based on this distinction alongside how other interviewees expressed different kinds of QoC criteria, for instance how some oncology criteria take 10-15 years to measure, we argue QoC criteria can be either ‘hard or ‘soft’ criteria. Hard criteria include for instance mortality and survival rate which usually require an extensive time frame and a large data sample in order to show a significant improvement. These kinds of criteria are often the objects of interest in long-term, medical, statistical studies. Soft criteria are other kinds of criteria that indicate value has been created for patients but are not these research-based, official, medical parameters. These would overlap with PREM, for instance how the patient is experiencing the side effects from a treatment. However, even though PREM and what we define as soft criteria often may overlap we cannot exclude the possibility that other kinds of

QoC criteria can also be categorized as soft criteria, for instance better quality of medical data reported. An improvement of the quality of medical data would be a soft criterion while a statistically validated improvement on a parameter such as mortality, based on this data, would be a hard criterion. In many cases one or several soft criteria may be indicators of potential future hard criteria. However, a soft criterion may not only be a gateway to a hard criterion but also a target by itself. For instance, Interviewee[14] expressed patient satisfaction, a soft criterion, as the most important criterion to evaluate. A division between hard and soft criteria can create a more extensive picture of a project's potential benefits. Furthermore, the division can be useful to assess short-term progress. The interviewees expressed a need to follow up results and track progress, even though most hard criteria require 10-15 years of data collection to secure statistical results. The difficulty of deciding an appropriate time frame when measuring innovation is discussed in the theory section. Perrin (2002) argues that one year is too short time to evaluate innovation projects, while other researches claim that it is difficult to isolate innovation projects as the factor for long-term effects uncertain (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998). The usage of both hard and soft criteria can help decision makers and innovation managers deal with this problem.

As mentioned previously the particular innovation project of this case study does not have concrete success criteria the project will be evaluated on. We will now analyse the two main identified reasons for this lack of success criteria.

The first reason can be connected to the analyzing theory on innovation. We discussed the uncertainty of innovation, for instance in terms of what particular activities will work, who will benefit, when benefits will occur etc. (Perrin, 2002). These kinds of uncertainty elements were highly present in our empirical findings. The anticipated information system the project aims to build addresses many potential benefits for several stakeholders, confirming Perrin's observation of uncertainty who will benefit and when benefits will occur. For instance, many of the interviewees were well aware that many of the positive effects the outcome of the project may generate would not be assessable within the project time frame. Another example was one interviewee (Interviewee[10]) who expressed that even though the involved parties had a high-level understanding of what benefits the project aimed to contribute towards it was also important to stay humble as *"to learn a lot"* was also a major expected outcome of the project. Even though learning from failure was not explicitly mentioned this aim to learn a lot can also be connected to the innovation theory and the section on how innovation is highly associated with learning from failure (Perrin, 2002). Therefore, the concerns raised in the innovation theory can be considered partly explaining the lack of success criteria in this innovation project.

The second reason for the lack of success criteria generated from our analysis of the empirical findings was the cost or effort of measuring. Several interviewees expressed attitudes that in an ideal world there would have been defined success criteria and the baseline of the current situation established. However, from both the pre-study and main study as we got to know the project it became clear resources for these kinds of activities were limited as all doctors involved in the project worked on it in addition to their everyday responsibilities. This indicates that the question of having success criteria or not is not a binary choice of yes or no, but rather a question of if there are available resources for measuring, and if the insights expected outweigh the cost and effort of measuring. The activities of measuring that require resources may for instance be coming up with relevant measurement parameters and collecting a baseline of the current situation on those measurement points. This perspective has not received a high amount of attention in literature on PM and success criteria, to our knowledge. Literature is rather concerned with what to measure but rarely reflect over the costs and efforts required for measuring and if the insights generated from measuring will outweigh the costs and efforts.

Combining these two reasons makes a quite compelling case that measuring success criteria is not necessarily obvious for innovation projects but rather associated with certain concerns and costs.

To conclude this section and answer our SRQ we state that QoC and Efficiency/Financial performance are reasonable sub dimensions to consider success criteria for project objectives for healthcare innovation projects, even though no explicit success criteria were set up in this case. However, there is often a linkage between QoC and Efficiency/Financial performance and an innovation project is often aimed towards improvements that address both. Within the QoC there can be a further division between hard and soft criteria, of which soft may be, but not necessarily have to, an indicator of a future hard outcome. We also conclude two reasons for why formal success criteria may not be set up for innovation projects. The first one can be connected to the empirical findings of the ATQ of innovation being uncertain and highly dependent on learning. The second reason was that the process of setting up and measuring success criteria is associated with costs and efforts that need to be considered.

5.3 Organizational Benefits

The final analysis section addresses how the empirical findings in 4.4, concerning the third SRQ: *“What kind of success criteria for organizational benefits, if any, do stakeholders define healthcare for innovation projects?”* can or cannot be answered by the empirical findings in 4.5, concerning the ATQ. This section will show that due to several limitations innovation projects are not appropriate to analyze using a long-term, organizational perspective such as the five performance objectives.

Our empirical findings indicate that the aim of the innovation project of the case study cannot be considered to address specifically one of the five performance objectives. It can rather be argued the outcome of the project has potential to affect all five objectives. It was also found that the borders between the five performance objectives were far from distinct. Instead the definitions of them often overlapped, as presented in the empirical findings with quality, speed and dependability clearly having overlaps.

Another limitation concerning the five performance objectives was that they did not cover all organizational benefits stakeholders expected the project could generate. One of the most frequently occurring organizational benefits in our interviews was external and internal improved cooperation and networking effects, which could lead to several of the performance objectives. One could therefore argue these networking effects are project objectives that eventually would lead to impact on at least one of the organizational performance objectives. However, this is not how we interpret our interviewees who quite clearly stated networking effects as by itself a long-term organizational benefit and not just a gateway to one or more of the performance objectives.

The next limitation is the challenge of isolating and measuring the impact of the innovation project on the organization. None of our interviewees could express reasonable success criteria for assessing the projects outcome on the organization. Two main reasons for this were identified. The first reason is the challenge to isolate the project's impact from other factors. Our interviewees expressed this project as part of other, larger restructurings going on in the hospital and how the organization was highly dependent on the particular people currently working in it. This indicates it would be highly challenging to verify how much of an improvement on any of the performance objectives can be trailed back to one particular project. This is the same challenge raised in 2.2.3, that the long-term consequences of innovation are especially uncertain (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998). The second reason there is a challenge of isolating and measuring the impact on the organization is that it is not the purpose of the project to improve the organization. The project is about building an innovation, an information system containing all relevant information on prostate cancer patients, which, if successful, may have potential to impact the organization. However, as the innovation does not exist yet, its impact on the organization is highly uncertain, which can be related to the uncertain nature of innovations in general (Perrin, 2002). Finding out if and what kind of impact the innovation may have on the organization if fully implemented is rather an outcome of the project in itself, and not reasonable to define accurately upfront. Even though this innovation is being developed within the Karolinska University Hospital, together with Philips Healthcare, and adapted to the hospital's systems for data

reporting etc. we would still not describe it as a project aimed to improve the organization. It is rather a project about jointly building an innovation, and the project happens to take place within the context of the organization the Karolinska University Hospital.

Taking all of these identified limitations into account we argue there is limited usefulness in assessing innovation projects' impact through success criteria in an organizational perspective. Innovation projects are rather about building the particular innovation, not about implementing and utilizing it in an organization. The implementing and utilizing part would be another kind of project that requires there is an existing innovation with proven potential. For those kinds of projects, with less uncertainty about what kind of organizational benefit the project addresses, it may be useful to set up success criteria on one or several of the performance objectives or on objectives from other long-term, organizational frameworks. The answer to the third SRQ is therefore that for innovation projects the organizational benefits dimension is not appropriate for setting up success criteria in. It is more useful to focus on the innovation itself and the project objectives. If the innovation is realized with proved potential, only then should the organizational perspective be considered.

In the upcoming chapter we show how the answers to our three SRQ's consolidate up to an answer to our overall RQ.

6 DISCUSSION

Based on the analysis above our theoretical framework requires adaption in order to better represent a suitable framework for success criteria for innovation projects. The adapted theoretical framework and our reasoning behind it answer our overall RQ: *“To what extent are traditional success criteria applicable to innovation projects?”*

We remove the dimensions Project management and Organizational benefits as we found such limited support for their usefulness in the analysis of our empirical findings. Within the Project objectives dimension we add two dotted arrows between the QoC and Efficiency/Financial performance to illustrate the analysis that many Project objectives cannot distinctly be categorized as either QoC or Efficiency/Financial performance. Instead they can often be argued to be appropriate in both sub dimensions. The arrows represent this complexity, that there often may be an influencing relationship in both directions. Making an internal process more efficient (Efficiency/Financial performance) may lead to an improvement in the assessment and/or treatment patients receive (QoC).

Next, we divide the sub dimension QoC into two kinds of criteria, based on the analysis of hard and soft criteria. Soft criteria represent those that assess value for patients, but may not be of the kind of official, medical parameters. Examples are patient satisfaction, doctor’s confidence in decision-making and patient data quality. For hard criteria it is possible to prove a significant improvement on a medical parameter, such as mortality and survival rate, but they usually require an extensive time-frame. We add a dotted arrow from the soft to the hard criteria to illustrate soft criteria can, but do not necessarily have to, be indicators of hard criteria. This division is useful to make as innovation projects often are conducted on a time frame too short to assess the hard criteria, which is in line with theory on the timeframe of evaluation (Gewin & Tarondeau, 1982) (Robertson & Gatignon, 1986) (Cooper, 1998). Also, these criteria are often highly multifactorial, meaning even if possible to evaluate within a project’s time frame, there still remains the challenge of ensuring you only assess the project’s impact on the criteria. The adapted framework can be viewed in Figure 10.

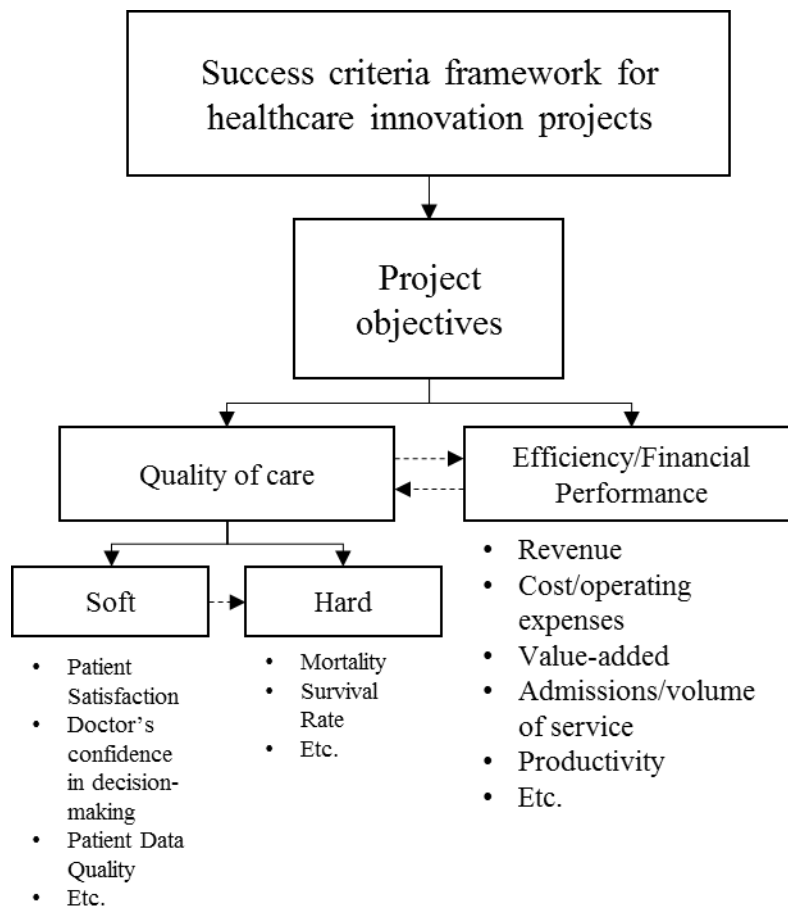


Figure 10. Success criteria framework for healthcare innovation projects - adapted

One thing important to mention is that the removal of PM criteria from the theoretical framework does not mean that project members should drop all focus on basic PM principles such as tracking time, progress and cost. The removal indicates that these are not appropriate criteria for evaluating, and in the extension comparing, innovation projects. That being said, many of our interviewees expressed an appreciation for projects with structured project plans that track progress etc. The establishing and following of a project plan is likely still highly useful in order to report and communicate progress to relevant stakeholders. However, putting targets on exact measurement parameters seem to be of limited usefulness. As Atkinson (1999) puts it: *“Time and cost are at best, only guesses, calculated at a time when least is known about the project. Quality is a phenomenon, it is an emergent property of people’s different attitudes and beliefs, which often change over the development life-cycle of a project.”* Based on our analysis this is especially true for innovation projects.

7 CONCLUSION

The conclusion starts by showing how this study has addressed the theoretical gap by answering the three SRQ's and the overall RQ (7.1). After that we discuss the limitations of this thesis (7.2), its implications for innovation managers and policy-makers (7.3) followed by suggestions for future research (7.4).

7.1 The Research Question and the Theoretical Gap

The overall RQ this thesis has addressed is *“To what extent are traditional success criteria applicable to innovation projects?”* To answer this question, we constructed a theoretical framework for success criteria, which was analysed with an alternative view, presented as the analyzing theory on innovation. The RQ was divided into three SRQ's based on the three dimensions of the theoretical framework. We also formulated an ATQ, based on the analyzing theory on innovation, to use for analyzing the three SRQ's.

For the first SRQ, *“What kind of success criteria for project management, if any, do stakeholders define for healthcare innovation projects?”*, we found that traditional PM criteria such as time, cost and quality are limited in their applicability to innovation projects. A major reason for this was that stakeholders defined the project as more dependent on the people involved than on a particular PM process. Stakeholder satisfaction was mentioned by several interviewees but the analysis showed that as innovation projects are dependent on the people rather than the process an evaluation of satisfaction is just focusing on the constellation of the people in the particular project and does therefore not allow for comparison with other projects.

For the second SRQ, *What kind of success criteria for project objectives, if any, do stakeholders define for healthcare innovation projects?*, we found that the division between QoC and Efficiency/Financial performance was appropriate but the two categories are not independent. Instead, several expected outcomes of the project can be argued belong to both kinds of criteria and therefore there may often be an interlinking relationship between. We found that within the QoC dimension it was useful to distinguish between soft and hard criteria, and that soft criteria may, but not necessarily have to, be early

indicators of hard criteria that usually require a longer time frame and a large data sample to verify an improvement on.

For the third SRQ, “*What kind of success criteria for organizational benefits, if any, do stakeholders define for healthcare innovation projects?*”, we did not find support that an organizational perspective is beneficial when evaluating innovation projects. As there is uncertainty about what the final innovation exactly will be, look like, be used for, stakeholders’ expectations on organizational effects varied greatly and there were no fruitful discussions on how criteria for the project’s impact on the organization could be derived.

The fourth question, the ATQ, was not a formal SRQ but rather a tool for studying the SRQ’s: “In what way does the nature of innovation influence how stakeholders define success criteria within the three dimensions of the theoretical framework?” We found support for all three categories of innovation (2.2.1 The Uncertainty of Innovation, 2.2.2 Learning From Failure, 2.2.3 The Time Frame of Evaluation) and that they contribute towards the lack and limited usefulness of success criteria in primarily the PM and Organizational benefits dimensions. However, we cannot say that the analyzing theory on innovation exclusively explains this lack. For instance, it was also found that measuring and evaluating success criteria is associated with a cost that implies the benefits of measuring must outweigh the cost for it to be worth it.

Reviewing our original RQ and the theoretical gap addressed we conclude that traditional PM methodologies with success criteria have limited applicability to innovation projects. To a certain extent, but not fully, this lack of applicability can be explained by the nature of innovation being uncertain, dependent on learning from failure and unpredictable in terms of time frame. Based on this conclusion we presented an adapted framework for innovation projects in healthcare that focus only on the project objectives and the relationship between them.

7.2 Limitations

The limitations of this study mainly concern the dependability and credibility of the results. Due to the time frame of the study being limited to only a few months the thesis was limited to one case. Studying several projects would have increased dependability. We also would like to raise some credibility concerns of the results, as interviewees have different experience of PM. We found that interviewees with more experience from PM was more likely to find it relevant to measure the PM process but also had a strong tendency to find limitations for measuring innovation. While interviewees with little or no

experience from PM focused the discussion on project objectives and had overall a positive attitude to measurements. Further, several of the interviewees took the presence of management researchers as a sign that measurements are important, which can have affected their answers.

7.3 Implications

The implications innovation managers and policy-makers can derive from this thesis is to evaluate innovations based on how well they satisfy project objectives and not by their PM process or their organizational impact. Within the project objectives it is important to be aware of the often long and unpredictable time frame of innovation and therefore a division between short-term and long-term effects, such as the one between hard and soft criteria, is beneficial to understand what impact to evaluate. What organizational impact an innovation may have should be considered first after an innovation with proven potential has been developed.

7.4 Future Research

The results of this study have open up several areas for future research. Firstly, more research is needed to investigate the generalizability of the findings of this study. The theoretical framework could with adjustments be applied in other innovation contexts than healthcare. Secondly, the findings suggest that the adapted framework focusing on project objectives is a good way to measure success in healthcare projects. Ascending studies needs to investigate the practical usage of this framework as well as its effect on decision making processes.

Further the study has touched upon several questions in need of more research. The study has investigated a case without predetermined success criteria. Future research needs to examine how decision making happen in innovation projects when no criteria exist, such as in this one. As this case lacks criteria, it makes an interesting research opportunity to follow the process of deciding whether to procure the innovation or not. The findings suggest that organizational benefits should not be a dimension to measure in healthcare innovation projects. However, the results have revealed a need to further research the five performance objectives, as interviewees have indicated that hospitals and healthcare organizations may have different trade-offs between the performance objectives than other organizations. Interviewees explained that higher quality could lead to lower costs, as fewer patients need revisits and double treatments. This highlights that the role of trade-offs between performance objectives may differ in healthcare organizations compared to many traditional private profit-maximizing organizations.

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9 APPENDICES

Appendix A. Interview Guideline

We understand that these are questions you may not have thought of. What we are studying is different people's views and opinions. Therefore, answer what you think and feel, rather than trying to answer "correct".

About the interviewee candidate

- What is your position (and responsibilities)?
- Describe how you are involved in the project.

Project objectives

- What improvements will this project lead to?
- Can you define / concretize these improvements?
- Are there any targets or measurements of what the project will lead to?
 - If yes, which?
 - If several, which do you think are good and/or important?
 - If no,
 - How could these improvements be measured?
 - Within what time frame could the various improvements be measured?
- Is it important to have pre-defined targets for this type of innovation project?
- Are there any risks of having pre-defined targets for this type of innovation project?
- Are there any problems with having predefined targets for this type of innovation project?
- Is there anything positive about not having pre-defined targets for this type of innovation project?

Project management

- What do you think characterizes a well-executed project?
- How do you think one can know if a project has been executed in a good way?
- How do you think the process of executing this project goes?
- How can you know if the execution of the project is / was good?
- Are there any targets or metrics to evaluate the implementation of the project?

- If so, which?
- If several, which do you think is good / important?
 - If yes, what would you like to evaluate?
 - How would you do this? (What goals / measurements would you have?)
 - If no, do you think it is good and/or important to have targets and indicators for the project management execution?
 - If no, can you explain why it is not important to evaluate the execution of the project?
- Is it important to have pre-defined goals for the execution for this type of innovation project?
- Could there be anything negative about evaluating the project management execution?
- Are there any risks of having pre-defined targets for the execution of this type of innovation project?
- Is there any problem with having predefined targets for the execution for this type of innovation project?
- Is there anything positive about not having pre-defined targets for the execution of this type of innovation project?

Organizational benefits

- Considering this project is at the prostate cancer department, what long-term benefits can this project lead to?
 - Will the project result in the organization become better at what it does?
 - Will the organization be able to do things it does now faster?
 - Will the organization be able to do things it does now safer, more reliable, more dependable?
 - Will the organization be more flexible?
 - Will the organization be able to save money?
 - If “Yes” on several:
 - Is it reasonable to become better on all these factors? Are there conflicts or trade-offs between the different types of improvements?
 - Are there targets or measurements for how the results of this project will contribute to the organization in the long-term?
- Is it positive or negative with that kind of goals and measurements on the organization?
- Is it important to have organizational targets for this type of innovation project?
- Are there any risks of having organizational targets for this type of innovation project?
- Is there any problem with having pre-defined organizational targets for this type of innovation project?

To be filled in by the authors after the interview:

| | |
|---------------------------------------|--|
| General comment: | |
| Roll in / affected by the project: | |
| Level of knowledge about the project: | |

| | Project management | Project objectives | Organizational benefits |
|----------------------------------|--------------------|--------------------|-------------------------|
| Time in the interview: | | | |
| What exists today? | | | |
| What improvements are there? | | | |
| How can they be measured? | | | |
| What is important? | | | |
| Any negative aspects / concerns? | | | |