Materialization and Management of Emergent Requirements of Key Stakeholders: A Case Study of Umeå Wastewater Treatment Plant Project

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Summary

Stakeholder satisfaction has in the modern day, become an imperative criterion to achieve project success. Satisfaction of stakeholders’ requirements however is challenging because these requirements evolve as the project progresses. Previous research indicates that as stakeholders continuously interact with a project, they gain more information and new requirements or request for modifications are likely to emerge as a result of this increased intelligence.

Nonetheless, conventional project management elicits requirements from stakeholders at the onset of the project, and uses these pre-defined requests to design the project. This practice hinders the ability of stakeholders to influence the project as it advances, and ill equips managers to handle and implement stakeholder requirements that materialize at subsequent phases. It is therefore important to investigate how emergent requirements of stakeholders come about and how they are managed in practice.

The objective of this thesis is to answer the research question, “From the perspective of managers, in the Scandinavian management context, how do emergent requirements of key stakeholders materialize, and how are they managed?” by probing into the ways via which emergent requirement of stakeholders come about, and investigating how managers deal with these emergent requirement upon their occurrence.

This qualitative study was conducted in the Scandinavian region using semi-structured interviews. Five respondents in managerial positions of the Umeå wastewater treatment plant project participated in the research and data collected concerned materialization and management of emergent requirements that surfaced during different phases of the project. The resulting data was then analyzed with reference to previously established theoretical frameworks.

Results from this study confirm that, new or modified requirements and consequently, requests for changes do emerge at even the execution phase of projects, despite careful planning. These emergent requirements are traced to three different sources and are managed in different ways depending on the type of requirement, whether strategic and critical or minor.

Keywords: stakeholder management, emergent requirements, requirements elicitation, change requests, stakeholder satisfaction
**Abbreviations**

**APM** – Association of Project Managers

**APMBOK** – Association of Project Management Book of Knowledge

**IPMA** – International Association of Project Managers

**PMI** – Project Management Institute

**PMBOK** – Project Management Book of Knowledge

**UMEVA** - Umeå waste and water AB

**WBS** - Work breakdown structure
Concept definitions

Agile project management – This is an approach to project management that is designed to permit iterative gathering and refinement of requirements throughout the life cycle of the project (APM, 2012, p.141).

Gap spotting – Gap spotting is a technique for constructing research questions with the aim of spotting gaps from review of existing literature (Sandberg & Alvesson, 2011, p.28)

Known - unknowns – These are types of project uncertainties that are acknowledged to be possible and for which it is rational to estimate and assign a probability of occurrence. Contingencies can be planned for such uncertainties using a contingency reserve.

Requirements management - Requirements management is the process of capturing, evaluating and validating stakeholders’ requests and needs. The process produces a clear set of baseline stakeholder requirements (APM, 2012, p.140).

Risk management – Risk management is a process that allows individual risk events and overall risk to be understood and managed proactively, optimizing success by minimizing threats and maximizing opportunities (APM, 2012, p.178)

Solutions development - Solutions development is the process of determining the best way of satisfying requirements by exploring options and then selecting and implementing the best solution (APM, 2012, p.146).

Unknown - unknowns – These are types of uncertainties that are completely unknown in a project, thus; intelligence about them is missing or unavailable to all. Probabilities can therefore not be estimated and assigned to these uncertainties and contingencies cannot be planned for them.

Value management – It is a consultative approach that focuses on the value that can be generated by stakeholder requirements. The goal of value management is not to maximize the satisfaction of requirements, nor to minimize the use of resources, but to establish the balance that maximizes the ratio (APM, 2012, p.141).
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1. Introduction

The aim of this section is to acquaint readers with the phenomenon of stakeholder management in projects. The chapter begins with the theoretical and practical background of the subject under study and leads to an identified gap, which forms the basis of the research question and objectives.

1.1 Background

Stakeholder theory created a paradigm shift from the concept that the only obligation of organizations is to increase economic growth for shareholders. This theory resulted in the recognition of other parties as influential groups who have a stake in an organization (Clarkson, 1995, p. 98; Donaldson & Preston, 1995, p. 67; Freeman, 1984; Harrison & St. John, 1993, p.29; Vinten, 2000, p.377). Firms today have widely embraced this theory and have adopted a broad strategic perspective that integrates the requirements and demands of multiple interest parties (Harrison et al., 2010, p.58; Verbeke & Tung, 2013, p.534). This stratagem is therefore deemed an essential subject, not only in organizations as a whole but also in projects (Walley, 2013, p.487). The process of stakeholder management is a managerial duty, which comprises identification, prioritization and effective communication with key interest parties so as to meet their needs and correspondingly increase stakeholder satisfaction; a factor discerned as an ultimate measure of project success (APM, 2012, p.116; Boyd, 2001, p. 426; Karlsen, 2002, p. 23; PMI, 2013, p.402; Ward & Chapman, 2008, p. 564).

Management of the different parties who influence or can be affected by decisions, activities and accomplishment of a project’s objectives is of utmost importance in the field of project management (Beringer, et al. 2013, p. 833; Walley, 2013, p.487). There is no shortage of different viewpoints and concepts in literature regarding stakeholder management; nonetheless, the aspect considered central to this theory is the elicitation of requirements from interest parties, preferably at the onset or prior to the design phase of a project (Jepsen, & Eskerod, 2009, p. 335; Walker, et al., 2008a, p. 646). Plans and solutions for this endeavor are generally developed strictly from a captured big picture of pre-specified requests. In practice, however, elicitation of well defined, detailed and accurate requirements prove to be remarkably challenging (IPMA, 2006, p.78; Mulla & Girase, 2012, p. 53) as stakeholders interact repeatedly with the evolving solution of projects and consequently construct enhanced understanding of their requirements (Thomson, 2011, p.69). That being said, difficulties inevitably arise in meeting the requirements of these interest parties, since aspirations and expectations develop continuously with time (Dvir & Lechler, 2004; Olsson, 2006, p.69; Thomson, 2011, p.70). Thus, strict adherence to
previously extracted needs will inhibit the ability of stakeholders to influence the project as it progresses (Coughlan et al., 2003, p.526; Nilsson & Fagerstrom, 2006; Tang & Shen, 2013, p. 516).

Traditional waterfall project management approach uses plans made from pre-defined requirements as specifications in designing a project towards its objectives (APM, 2012, p.141; Tang & Shen, 2013, p.516; Yang et al. 2010, p.906). However, inasmuch as plans are formed meticulously, from sophisticated communication strategies established and employed to facilitate smooth elicitation of stakeholder needs, some of these interest parties are still disappointed at the results if important requirements that emerge along the line are not incorporated in the project (Meredith & Mantel Jr., 2009, p.241). As stakeholder satisfaction has been certified as one of the most critical success factors of projects in the 21st century (Davis, 2013), it is necessary to consider these emergent requirements that have potential to not only add value, but also increase the level of acceptance and satisfaction of stakeholders and thus, increase chances of reaching project success (Boyd, 2001, p.423; Cooke-Davies, 2002, p.185; Davis, 2013, p.193). The Scandinavian school of projects recognizes the dynamic nature of the project environment and consequently embraces uncertainty as an everyday reality in contrast to traditional approach that struggles with it.

On the other hand, even with the change in trend of what is considered as project success, the iron triangle (time, cost, quality) used as indicators of project performance, remains a fundamental requisite. Managers therefore feel uncomfortable dealing this “requirement mess” (Jarke et al, 2011, p.996; Pich et al, 2002, p.1013) as it places them between a rock and a hard place. From one viewpoint, emergent requirements are perceived as potentially disadvantageous to schedule and budget constraints; yet from another angle, dissatisfaction of stakeholders, which can potentially result from disregard of emergent requirements, can lead to the detriment of the project. Accordingly, attempts have been made to cushion such uncertainties and specific industries such as the information technology industry, adopt a highly flexible approach of agile project management, where change control forms an integral part of the solution development process (APM, 2012, p.129). A concept of value management is also noteworthy in APM (2012,p.141), which is an approach to requirements management, and solutions development that seeks to establish a balance that maximizes the ratio of stakeholder requirements satisfaction and minimizes use of resources. Notwithstanding, discussions in literature regarding this topic predominantly concerns the impact of change and change requests on factors such as cost and time baselines and the central content of such discussions address mainly known-unknowns. The root causes that trigger these emergent requirements of stakeholder are not established in literature and processes engaged to manage these unforeseen requests is an insufficiently exposed topic which has not been subject to empirical scrutiny.
1.2 Research question

From intense review of literature and the employed technique of gap spotting (Eisenhardt & Graebner, 2007, p. 26; Sandberg & Alvesson, 2011, p. 33) leading to the identified issue outlined above, this research study will seek to answer the following question:

“From the perspective of managers, in the Scandinavian management context, how do emergent requirements of key stakeholders materialize, and how are they managed?”

1.3 Research objective

The objective of this study is to probe into how emergent requirement of stakeholders in a Scandinavian project come about and to investigate how managers deal with these emergent requirement upon their occurrence.

1.4 Research disposition

Chapter 1: Introduction – The aim of this section is to acquaint readers with the phenomenon of stakeholder management in projects. The chapter begins with the theoretical and practical background of the subject under study and leads to an identified gap, which forms the basis of the research question and objectives.

Chapter 2: Theoretical frame of reference – In this chapter, the academic frame of the thesis is discussed. First, stakeholder theory is introduced and its evolvement into project management is established. After an outline of the stakeholder management process, the importance of stakeholder satisfaction in projects is explored. Finally, the nature of stakeholders’ requirements is investigated, the influence of the project environment on achieving stakeholder satisfaction is analyzed and the Scandinavian approach to project management is presented.

Chapter 3: Methodology – The strategy and system used in data collection for this study is discussed and justified from both theoretic and practical standpoints in this chapter. In the first part, the authors’ view and understanding of the nature of the world is addressed, the underlining scientific approach is supported and the investigative tool considered appropriate for the research is argued for. In the second part of this chapter, the research approach used for data collection in this thesis is analyzed. This part focuses on sample criteria for choosing participants, interview respondents, non-response analysis, interview design and procedure as well as limitations. Reliability and validity of data is also discussed.

Chapter 4: Empirical Findings and Analysis – In this chapter, empirical results from this study is presented and assessed. Patterns in findings are gathered into themes and then analyzed for commonalities or deviations from theory in literature. Analyses of these findings form the basis for the conclusion chapter.
Chapter 5: Conclusion – In this chapter, the precise results, thus response to our research question, from our findings are recapped and outlined. The theoretical and practical implication of the study is discussed and concludes with limitations as well as proposals for direction of future research.
2. Theoretical frame of reference

In this chapter, the academic frame of the thesis is discussed. First, stakeholder theory is introduced and its evolvement into project management is established. After an outline of the stakeholder management process, the importance of stakeholder satisfaction in projects is explored. Finally, the nature of stakeholders’ requirements is investigated, the influence of the project environment on achieving stakeholder satisfaction is analyzed and the Scandinavian approach to project management is presented.

2.1 Stakeholder Theory

Stakeholder theory is arguably one of the most prominent and well-known theories of business management with its roots traced back to the work of Freeman (Mainardes et al, 2011, p.227; Stieb, 2009, p.402). The intent or main purpose of this theory is to recognize that other parties aside stockholders have interests in organizations and consequently, regard a corporation as a coalition of interest groups with a stake (Harrison & St. John, 1993, p.29). The theory is based on credence that a company has relations with many essential parties both inside the firm and in the environment external to it and the role of these groups are crucial to the success of the organization. Hence, addressing the interests of legitimate stakeholders is of central value. (Clarkson, 1995, p. 98; Donaldson & Preston, 1995, p. 67; Freeman, 1984). Following the genesis of stakeholder theory, many scholars have deliberated, redefined, built on, criticized and defended this concept.

From the perspective of Milton Friedman, a protagonist of the shareholder model of business, the only social responsibility of a business is to increase profits for shareholders. (Ghoshal, 2005, p.79; Tullberg, 2013, p.127; Vinten, 2000, p.377). He argues that by focusing on and allowing investors in an organization to prosper, there will be a consequent rise in economic growth and all other stakeholders will benefit as a result. This view thus, admits stakeholder existence and the need to thrive yet subsumes stakeholder interests to those of a dominant group (Freeman et al., 2007, p. 309). Other analysts of stakeholder theory call attention to the difficulties associated with defining and identifying specific stakeholder groups and realizing a kind of “balance” among their varied and potentially conflicting interests (Mainardes et al., 2011, p.241; Preston & Sapienza, 1990, p.362).

Despite discrepancies and controversies in the academic world concerning this theory, the ultimate goal of achieving competitive advantage in a firm has been positively related to stakeholder management (Verbeke & Tung, 2013, p.534). A common denominator of conversations about modern strategic management is the underlying reasoning that “to achieve high performance, firms must adopt a broad strategy-making perspective that incorporates the needs and demands of multiple stakeholder groups (Harrison et al., 2010, p.58) ”. Another recurrent conclusion is that maximizing shareholder value at the expense
of other stakeholders is an inherently myopic strategy and research evidence provides support that firms that practice management for stakeholders have better financial performance and create more value (Harrison et al., 2010, p.70).

2.2 Stakeholder management in projects

Although the stakeholder concept was initially rooted in strategic management of organizations, the applicability of the theory has evolved. Stakeholder theory is now employed in other areas of research including project management (Beringer, et al. 2013, p. 833; Walley, 2013, p.487). McElroy & Mills (2003, p.103) define stakeholder management as a constant development of relationships with stakeholders for the purpose of achieving a successful project outcome. Management of stakeholders is an extensively discussed topic as it is deemed an essential aspect of project management and many lessons can be drawn from general approaches developed in this field (APM, 2012, p.117; Jepsen, & Eskerod, 2009, p. 335; Walker, et al., 2008a, p. 646).

The main aim of stakeholder management is to effectively meet demands and requirements of interested parties in order to increase chances of attaining stakeholder satisfaction, a factor discerned in literature as a sine qua non to project success. This objective justifies the strong linkage of this concept to project performance (Andersen et al., 2006, p. 130; APM, 2012, p.117; Donaldson & Preston, 1995, p. 7; Jepsen, & Eskerod, 2009, p 337; Roeder, 2013; Ward & Chapman, 2008, p. 564) and implies that as good management of interest parties is advantageous in a project, poor management can be a source of complications such as misunderstandings, conflict and friction between stakeholders necessitating conflict resolution actions (Aaltonen, 2011, p. 170; Consoli, 2006, p. 76; Walley, 2013, p. 486).

Stakeholder management process is a managerial duty that begins with systematic familiarizing with various stakeholders of the project in order to decide on the right parties to include when defining project objectives and success criteria (APM, 2012, p.116; Karlsten, 2002, p. 23). After identifying this key group, a succeeding step that is equally important, is the effective engagement of stakeholders by creating and maintaining relationships with them in order to analyze, communicate and work closely on their needs and expectations (Karlsten, 2002, p.23; IPMA, 2013, p.402).

Karlsten (2002, p.24) outlines stakeholder management in these six steps: initial planning, identification of stakeholders, stakeholder analysis, communication, development of strategies to be implemented, follow-up step with a focus on realized strategies and evaluation for the need of change. However, stakeholder management is context specific and adopted methods, tools and techniques chosen should mirror this context. This means that an established approach used in a project, for instance in the construction industry, should not be expected to be equally effective in another industry or another project in a different context where a focus on changes in human behavior may be more emphasized (Bourne & Walker, 2005, p. 657; Jones & Wicks, 1999, p. 521; Walley, 2013, p. 486; Ward & Chapman, 2008, p. 575).
The task of managing stakeholders has its challenges. APMBOK (2012, p.117) states “stakeholder management becomes more complex when stakeholders’ views, roles or allegiances, etc. change throughout the life cycle and for this reason, stakeholder management must be repeated throughout the project”. The project manager therefore needs to be aware of possible refinements in requirements of interest parties and act accordingly; as the outcome of stakeholder management is very dependent on the project manager’s skills, relationships, experiences, competence and ability to communicate and influence stakeholders (Karlsen, 2002, p. 23; Jepsen & Eskerod, 2009, p. 336).

Harrison et al. (2010) discuss “management for stakeholders”: an expression that is used to describe the approach, where “stakeholders are allocated more value than which is necessary to simply maintain their willful participation (p.61)”. This way of dealing with interest parties is in contrast to the “arms-length” approach where stakeholders are considered as economic actors. The authors ascertain that this type of conduct towards stakeholders leads to competitive advantage. Ergo, in the present era of strong competition between firms, there is a need for shift in attention and focus of project managers, from excessive enforcement and reliance on strict control of stakeholders to an increased emphasis on the “management for stakeholders” approach. (Karlsen, 2002, p. 24; Newcombe, 2003, p. 847). Excessive dependence on control of stakeholders can create the feeling of mistrust, which can be damaging to the objective of achieving satisfaction and the ultimate target of project success (Karlsen, 2002, p.19; Ward, & Chapman, 2008, p. 573).

The quality of retrieved requirements can be deeply impacted if a problem of communication exists in a project (Mulla & Girase, 2012, p. .51). Communication is an important element of stakeholder management, focused on sharing of ideas and not just mere conveying of messages; in order to not simply relay information but to negotiate, understand and manage interests in a way that engages stakeholders (Bourne & Walker, 2004, p. 234, PMI, 2013, p. 391). When this dialogue is not encouraged, especially at an early stage, problems of conflicts and distrust can persevere to the detriment of the project (Thomson, 2011, p. 71, Jepsen, & Eskerod, 2009, p. 336). Interpersonal skills of the project manager such as ability to build trust, resolve conflicting issues, be sensitive, use active listening skills, be receptive to stakeholder requirements and understand anticipations, contribute to enhanced communication and consequently, better stakeholder management (PMI, 2013, p. 407; Newcombe, 2003, p. 847).

2.2.1 Stakeholder Identification: Who are stakeholders?

From Freeman’s (1984, p.46) definition of stakeholders as “any group or individual who can affect or is affected by the achievement of an organization’s objectives”, an overwhelmingly large amount of interest parties can be named as it implies that “stakeholders are identified by their interests in the corporation, whether the corporation has any corresponding functional interest in them or not (Donaldson, & Preston, 1995, p. 67)”. Though this definition is quite broad, there is a noticeable distinction between strategic stakeholders and stakeholders that are considered for ethical and moral reasons (Beringer et al., 2013, p.831; Walley, 2013, p.487; Ward & Chapman, 2008; p.564).
Different versions of stakeholder definition which all seem to be merely adaptations of Freeman’s version exist in literature (APM, 2012, p.116; Beringer et al., 2013, p. 831; Harrison et al., 2010, p.60; International Finance Corporation, 2007, p. 10; Karlsen, 2002, p.19; Newcombe, 2003, p.842; PMI, 2013, p. 393; Walker et al., 2008b, p 73). Harrison et al. (2010, p.60) define stakeholders as “groups and individuals who can affect, or are affected by, the strategic outcomes of a firm”. The PMBOK defines them as “individuals, groups, or organizations who may affect, be affected by, or perceive themselves to be affected by a decision, activity, or outcome of a project” (PMI, 2013, p.394) and the APM (2012, p.116) define them as “individuals or groups with an interest in the project, because they are involved in the work or affected by the outcomes”. From these narratives, there is a recognized challenge in expressing who is considered a stakeholder and who to exclude in this consideration. This challenge lies in the difficulty of distinguishing between who influences or is influenced by activities of a project or organization as unrepresented groups may feel randomly exempted from benefits of the project (International Finance Corporation, 2007, p.14).

Freeman (1984) also makes a distinction between internal and external stakeholders. Internal stakeholders such as project owners, contractors and designers have formal relationships with or are connected to the firm through contracts and therefore directly participate in the decision making process of a project (Newcombe, 2003, p.842; Ward & Chapman, 2008, p.564). External stakeholders include users, the community, the media, government, environmental groups etc. This group, though not seen as official members of the project, should be considered influential as their cooperation and input is essential (Atkin & Skitmore, 2008, p. 549; Aaltonen, & Kujala, 2010, p. 382, Ward & Chapman, 2008, p. 564). Nevertheless, some external stakeholders are often overlooked in projects or not given the right amount of attention and therefore the project manager must be cautious to prevent over narrowing or ignoring of these important interest parties (International Finance Corporation, 2007, p.14; Walker et al, 2008a, p. 648).

Stakeholder identification is clearly not a straightforward process and information about stakeholders is not always readily attainable (Mulla, & Girase, 2012, p. 54). Project managers have the complicated task of making an exhaustive and restricted list of interest groups throughout the lifespan of the project, whilst having in mind that anticipated stakeholders are likely to change as the project progresses (Jepsen, & Eskerod, 2009, p. 339, Mulla, & Girase, 2012, p. 54, PMI, 2013, p. 398). Project managers also deal with the dilemma of deciding appropriateness of classifying individuals as a group or a group as individuals.

On that account, stakeholder identification is deemed a challenging task, which has the potential to be ineffective since by definition; prospective interest parties are limitless (Jepsen, & Eskerod, 2009, p. 339). As it is pivotal to identify the right stakeholders at the initial phase, and to understand the nature of power and impact they will have on the project (PMI, 2013, p. 394; Walker, et al., 2008a, p. 648), the project manager and his team must possess strong intuition and analytical skills in order to accomplish this fundamental task (Walley, 2013, p. 500; Walker, et al., 2008a, p. 645).
2.2.2 Stakeholder Prioritization: who matters?

After the question of who counts as a stakeholder in a specific project is answered, the next question a project manager asks is who matters? The response to this question calls for prioritization of identified stakeholders (Mulla, & Girasse, 2012, p. 56). Stakeholder prioritization is the categorization of acknowledged stakeholders in order to map out the most vital interest parties with the most impact on a project and accordingly, concentrate substantially on their needs. This is an important part of stakeholder management as identified parties are not all due equal diligence (Roeder, 2013; Mitchell et al., 1997, p.854; PMI, 2013, p. 394).

Mitchell et al., (1997) address the question of stakeholder salience, which explains to whom and what managers give the most attention. Recognized parties are categorized as/by:

a) Stakeholders with ability to influence in a project versus stakeholders with a right to claim a stake in the project.

b) Potential stakeholders like those that are not willfully placed at risk, versus actual stakeholders who have a relationship, such as contractual agreement, with the firm or project.

c) Power dependence, thus if project depends on a stakeholder versus the situation where the project has power over the stakeholder. Mutual power-dependence relationships also exist.

From the framework of the authors illustrated in Figure 1 below, prioritization of this group is dependent on stakeholder attributes such as power to impact, legitimacy of relationships between stakeholder and the project, and urgency of their requirements. The level of power possessed by a certain stakeholder is based on their ability to activate different forces such as political, social and economic; and also, the impact they have on the amount of resources available to a project (Mitchell et al., 1997, p. 854; Ward, & Chapman, 2008, p. 564). Power therefore encompasses the potential of a stakeholder to affect or threaten a project. Legitimacy addresses how justified a claim on a project by a stakeholder may be. When combined with power, legitimacy creates authority to enforce action. In spite of power and legitimacy of other stakeholders, certain interest parties may have compelling needs that may call for immediate attention. This necessitates the third attribute of urgency in the process of prioritization (Mitchell et al, 1997, p.856).

Depending on the mix of power, legitimacy and urgency, stakeholders are assigned an appropriate level of salience. Dormant, discretionional and demanding stakeholders are considered as latent stakeholders because they possess only one attribute and are therefore usually given the least attention. Dominant, dangerous and dependent stakeholders possess two attributes and are accordingly categorized as moderate salience stakeholders. Definitive stakeholders are distinguished as the most important because they possess all three attributes of power, legitimacy and urgency. However, stakeholders can become definitive during different phases of a project by acquiring the previously missing attributes. Interest parties of a project are consequently dynamic and stakeholder prioritization is considered an iterative process as key stakeholders can change at different stages of projects (Mitchell et al, 1997, pp.874-882).
Figure 1 Stakeholder prioritization framework

Source: Mitchell et al. (1997, p. 874)

More often than not however, stakeholders are evaluated and categorized using the sorting criteria of relevant mix of power and interest (Newcombe 2003, p. 844). The classes of stakeholders who have authority and are determined to see the project through are labeled core stakeholders (Walley, 2013, p. 488). Clients and end users are generally considered the most significant stakeholders of a project, because without support of customers, a project may seize to exist and end users are the parties that adjudge the usefulness of the outcome or product (Karlsen, 2002, p.22). Other interest parties usually considered key to projects as they are instrumental in decision-making and are highly affected by project outcome include sponsor, the project manager and development team (PMI, 2013, p. 396).
2.3 Stakeholder satisfaction as critical success factor of projects


Davis, (2013), from her rigorous investigation of perceived project success, conducted using an integrative literature review from different time periods, ascertains that in the 21st century, the view of project success has evolved from the emphasis on technical performance measures of time, cost and quality (the iron triangle) to a strong focus on stakeholder satisfaction. Project success in the modern world, is seen as highly dependent on internal and external stakeholders of the project; as success is constantly being symbolized by stakeholder assessment of the magnitude to which their targets have been achieved, hence, stakeholder satisfaction (Boyd, 2001, p. 426; Eskerod & Huemann, 2013, p. 37; Thomson, 2011, p. 71).

The critical role of stakeholder satisfaction is highlighted by PMI (2012, p. 469), which states “planning for and managing the communication needs of the project as well as the stakeholders’ needs are two distinct keys to project success”. Turner & Zolin (2012, p. 88) propose that success of a project can only be assessed during subsequent months and years after completion. They therefore proceed a step beyond stakeholder satisfaction at project completion to develop a model that determines the forecasted success of a project by the judgment of multiple project stakeholders about the performance of the project’s output, outcome, and impact in the months and years following the project.

From analysis of different perceptions of project success by different stakeholders, Davis (2013) discovered that stakeholder satisfaction appeared as a recurrent theme especially between project managers and clients. This observation is noteworthy because project managers and clients are the most cited stakeholders when measuring project success implying that their viewpoint is seen as exceptionally significant. To conclude, the author asserts that her findings undeniably demonstrate the influential impact of stakeholder satisfaction on a project.

Dissatisfaction of stakeholders has also been noticed to have an equal but opposite impact on success, as stakeholder perception has the influence to taint project outcome (Turner & Zolin, 2012, p.87; PMI, 2012, p.391). In recent times, even projects that have achieved project management success of time, quality and cost can be pronounced a failure if they are unable to meet a certain level of satisfaction of their key stakeholders. An example of such an instance is the Heathrow Terminal 5 project, a mega-project that was on schedule and on budget, but was perceived by stakeholders as unsuccessful when it failed to meet set expectations (Brady & Davis, 2010). This demonstrates the impact and significance of the role of meeting stakeholder expectations in projects and highlights the need to take a closer look at how to achieve this concept that seems utopian.
2.4 Stakeholder requirements and their management in projects

It has been established that stakeholders have influence on the direction and decision-making of projects and this allows them to have significant impact when it comes to maintaining the status quo or enforcing major changes. Stakeholders therefore, have the power to shape project strategy (Newcombe, 2003, p.842). After identification and prioritization of stakeholders, the next step in the process of stakeholder management is the analysis of interests and requirements. APM (2012, p. 140) defines requirements management as the process of capturing, assessing and justifying stakeholders’ wants and needs. The body of knowledge states that a well-defined and agreed expression of requirements in the form of tangible deliverables, business benefits, as ambitions or solutions, and as functional or technical needs; as well as the acceptance criteria of these requirements is essential for success.

The overarching aim of a project is to carry out tasks that meet different requirements and expectations of stakeholders even though some of these requirements can bring about conflicting issues (International Financial Corporation, 2007, p.13; Newcombe, 2003, p. 843). Capturing of requirements at the early stage of a project through effective communication modes like briefing meetings and interviews has been identified as an important facet of stakeholder management (Olsson, 2006, p.68; Tang & Shen, 2013, p. 513). Failure to clarify expectations, concerns and priorities at an early phase can be a source of many difficulties in later stages such as need for redesign, unproductive work, late delivery, increased expenditure and dissatisfaction of clients (Atkinson et al., 2006, p 689; Mulla and Girase, 2012, p. 51; Yu et. al., 2006, p. 245).

Requirement elicitation does differ between industries, particularly in the software industry in comparison to others. However, projects that use waterfall project management concentrate on capturing of requirements at the onset of a project and it is common practice to use this captured big picture of pre-specified requirements in the design phase of the project which can inhibit the ability of the stakeholder to influence the project as it progresses (APM, 2012, p. 141; Coughlan et al. 2003, p. 526; Nilsson & Fagerstrom, 2006; Tang & Shen, 2013, p. 516; Yang et al. 2011, p. 906). Meredith & Mantel Jr. (2009, p. 24) assert that project mission statement and detailed descriptions are derived and planned from these requirements as the purpose of a project plan is to facilitate later accomplishment of stakeholder requirements. This is supported by the APM (2012, p. 146), which states that requirements are solution free; thus they simply state clearly the wants and needs of stakeholders and do not define exactly how these needs will be accomplished. Elicited requirements are therefore followed by solutions development to meet these gathered requests. Once a solution has been identified which meets the stated requirements, project plans are birthed and illustrated using a work breakdown structure (WBS). Even though the waterfall approach and method of diffusing stakeholder requirements strictly into project plans has sufficed in some circumstances, there are some significant problems associated with this mode of requirement elicitation and management. IPMA (2006, p. 78) states that “start-up stakeholder requirements may be vague, their anticipations impractical and probably undeliverable”. Jepsen & Eskerod (2009, p. 340) highlight the difficulty associated with finding out what stakeholders really expect. Mulla
& Girase (2012, p. 53) contend that critical information about requirements are frequently disregarded, partly documented or misunderstood by responsible parties, which makes elicitation of clear, accurate and precise requirements remarkably challenging. And, Meredith & Mantel Jr. (2009, p.241) affirm that planning, even after requirements are derived, is an iterative procedure generating improved proposals from previous plans and establishes that the process although described formally, does not occur formally. Boyd (2001, p.423) and Coughlan et al (2003, p.424) suggests that to ensure success, project teams must go beyond conventional requirements engineering procedures to fully recognize and appreciate stakeholder motivation.

From the research of Thomson (2011) about uncertainty and its effect on project outcome, he reveals that the assumption that strict adherence to realizing a pre-specified set of requirements generated at the beginning phase of a project will result in project success, “devalues the dialogue that stakeholders have with the emerging solution and each other in which they socially construct improved understanding of their requirements (Thomson, 2011, p.69)”. From the author’s standpoint, this traditional view assumes that stakeholders are able to specify all of their vital needs at the initial stage of the project and the project team is able to readily understand these needs (Olsson, 2006, p.66). However, as the project progresses, the level of awareness and knowledge of the client improves significantly and their needs are therefore understood much better than they were during requirement elicitation phase at the initial stage (Thomson, 2011, p. 69, Ward & Chapman, 2008, p. 565). Given these reasons, there is bound to be challenges in meeting requirements as demands and expectations will change or evolve continuously with time (Dvir & Lechler, 2004; Olsson, 2006, p.69; Thomson, 2011, p.70). On that account, flexibility is essential, but is often not preferred for or even perceived as a threat in the execution phase of projects especially from stakeholders other than project owners and users (Olsson, 2006, p. 68).

Some methodologies, including an agile approach, which requires cautious tactics to prevent cost escalations, are designed to permit the continuous collecting and modification of requirements on the assumption that the stakeholders may not be sure of their needs (APM, 2012, p.142). This approach is commonly associated with the software industry due to high modularity of projects in this business, thus, the option to split the project into independent sub-units, and because the objectives of such projects are usually intangible (Olsson, 2006, p. 68). This is opposed to “one-piece” projects such as building of bridges or tunnels in the construction industry. Nevertheless, there is a valid need for a similar methodology to agile management in even such industries to address the use of incorrect or incomplete requirements.

Although projects need to be controlled and change management is important to keep project baselines in place; given the turn of definition of project success nowadays, it has become imperative that more attention be given to how best, even emergent requirements of stakeholders can be integrated into projects to further facilitate and heighten the chance of obtaining stakeholder satisfaction, an accepted prerequisite to project success (Bourne & Walker, 2004, p. 227, Thomson, 2011, p. 69).
2.5 Nature of Project Environment

The environment surrounding projects has generally been established in literature as one that is complex, uncertain and dynamic and requires some degree of flexibility (Hällgren et al., 2012, p.700; Klein et al., 2014, p.5; Kreiner, 2012, p.716; Olsson, 2006, p.67; Pich et al., 2002, p.1019; Thomas & Mengel, 2008, p. 309; Thomson, 2011, p.79; Yang et al., 2010, p.300). Pich et al., (2002) have statistically modeled a project as a payoff function that is dependent on the state of the world and consequences of actions on this state. This model represents a causal mapping and the authors assert that the impact of possible actions on the state of the world may be incompletely known or absolutely unknown by the project team. They define three existing approaches that can be used depending on the adequacy of available information in the world of a particular project, namely: instructionist, learning and selectionism.

The instructionist approach is deemed suitable for situations where adequate information is known about all possible factors or events that are likely to influence the project and project team can therefore approximate the probability of the risks they are likely to face. When information is unavailable or inadequate, such estimates are impossible to make. In light of this, the approach of learning, used when information is insufficient, involves attentiveness to new intelligence that may become available with the progress of a project in order to update, re-plan and improve the project model. Nevertheless, in some cases, the project environment can render learning ineffective and an experimental approach of selectionism is employed. When information is inadequate and the environment is not sufficiently rich to learn from, the best option is to launch multiple project efforts and observe the one that yields the best outcome or solution (Pich et al, 2002, pp.1012- 1017). The authors conclude and argue that widely used project management techniques assume adequate information and use an instructionist approach, i.e. traditional approach of risk management/contingency action, that pre-specifies and set off actions based on signals.

The use of instructionist approach supposes that all possible events are predictable, and can therefore be planned for using risk management procedures. Risk management is focused on circumstances or probabilities where the project team is aware a situation is possible, but is unsure when or if it will occur. Unfortunately, contingencies cannot be planned for unknown-unknowns. Project managers and teams must therefore be willing to change their model or representation of the world by updating as and when new and relevant information become available (Pich et al., 2002, p.1013). The instructionist approach is only sufficient when information about world state and payoff effects of actions is adequate, however, complexity and ambiguity caused by interplay of numerous variables, result in information inadequacy which calls for the use of an approach that has the capacity to accommodate new and original planning in the middle of a project or pursuit of several candidate solutions until the best is identified. Olsson (2006, p.68) states that the types of projects with low flexibility assume stable environments. Nonetheless, the assumption of stability does not ascertain that the project environment is indeed stable; it only means management of the project is not designed for adjustments within the time frame.
As diverse interest parties interact and influence projects at all the different phases, stakeholders are considered a main source of uncertainty in projects. (Aaltonen & Kujala, 2010, p. 381; Karlsen, 2002, p. 20; PMI, 2013, p. 406; Ward & Chapman, 2008, p. 563). Unpredicted actions that contribute to development of this environment include unexpected request for alterations, over focus on details by clients, unforeseen demands and requirements of end-users resulting in the often-discussed problem of scope creep in project management (Karlsen, 2002, p. 22; Olsson, 2006, p. 69; Walley, 2013, p. 489). Hällgren et al. (2012, p.700) perceive uncertainty as an organizational reality and associate the attempt to avoid changes in operations, by isolation of a project from this dynamic environment, to existing bureaucratic mechanisms in the project. Kreiner (2012,p.714) therefore argues for the need to “get real” in our thinking and theorize project management under imperfect, but realistic circumstances in which complexity, uncertainty, and ambiguity are central. Embracing flexibility is seen as an opportunity to have alternatives that can result in far better outcomes (Olsson, 2006,p.67; Atkinson et al., 2006, p 692). Klein et al. (2014,p.10) also recognize that, modern projects are becoming increasingly complex and project teams must therefore have the will and competence to re-plan, adjust and transform existing processes if necessary rather than trigger pre-planned responses.

Although scholars argue for flexibility in projects, they acknowledge that this approach comes with challenges. Different stakeholders interpret differently the need for flexibility to face the reality of uncertainty in future performance of the project. While some perceive this as possibly beneficial to their aspirations, others are unpleasantly surprised and disappointed with the outcome of decisions made during these times (Atkinson et al., 2006, p 697; Ward & Chapman, 2008, p. 575). Pich et al. (2002, p.1014) aver that the approach of learning instead of the instructionist method can be time consuming, psychologically difficult and is often resisted, as it requires a greater level of flexibility than contingency planning. Wang & Ko (2012, p.425) buttress this point by suggesting that the high uncertainty, equivocality and complex nature of the project environment creates challenges when managing stakeholders and the project in general because of dependency between projects and uncontrolled elements in its environment. Nevertheless, Klein et al. (2014) recommend that project managers should be resilient and aware of complexity of the environment so as to incorporate and tackle its impact to deliver a successful project.

2.6 The Scandinavian Approach to Project Management.

The Scandinavian school of project studies concentrates on a theme that invites scholars and practitioners to rethink the current project management trend (Sahlin - Anderson & Soderholm, 2002, p.14). The foundation and basis of the Scandinavian approach to project management is linked to the Scandinavian project literature classic, *Projektledelse i løst koblete systemer: ledelse og læring i en ufuldkommen verden* (Project Management: to manage and learn in an incomplete world) by Christensen and Kreiner (Hällgren & Jacobson, 2014, p.695). Hällgren & Jacobson (2014) attest this, as one of the primary efforts to challenge conventional project management literature and assert that traditional project management practices are not adequately prepared to handle uncertainty. The emphasized idea behind this approach is that the world is dynamic, and although projects
are seen as drivers of change, the fundamental rationality of project procedures makes them ill-equipped to manage the same (Hällgren & Jacobson, 2014, p.696).

The Scandinavian approach to project management stems from a new outlook, which embraces uncertainty as an expected and accepted part of project reality and deals accordingly with inevitable emergent situations that are prevalent in every stage of a project. (Cicmil et al, 2006, p.678). It supports the notion that, project objectives must not be rigidly outlined at the initial phase where very little is known about what is to be attained and the outcomes to anticipate (Sahlin - Anderson & Soderholm, 2002, p.265). Instead, a vision should be defined which appreciates proposals and decisions as inputs to the “dynamic, interactive, and to a large extent, uncontrollable project process (Hällgren & Jacobson, 2014, p.697).” Plans are therefore converted into an ongoing interactive system rather than a specified route map and this approach advantages projects with the ability to handle the sting that comes with project surprises such as emergent requirements (Laufer et al, 1997, p.2; Hällgren & Jacobson, 2014, p.697).
3. Methodology

The strategy and system used in data collection for this study are discussed and justified from both theoretic and practical standpoints in this chapter. In the first part, the authors’ view and understanding of the nature of the world is addressed, the underlining scientific approach is supported and the investigative tool considered appropriate for the research is argued for. In the second part of this chapter, the research approach used for data collection in this thesis is analyzed. This part focuses on sample criteria for choosing participants, interview respondents, non-response analysis, interview design and procedure as well as limitations. Reliability and validity of data is also discussed.

3.1 Ontological and epistemological stance of researchers

The philosophical stance of the research encompasses essential assumptions about the way we, as authors, perceive the world. These philosophical ideas and assumptions influence the way the business research should be conducted and is the underpinning of the research strategy, as well as the methods and approaches selected as part of that strategy. Epistemology and ontology are the modes frequently used to express this philosophical stance (Bryman & Bell, 2011, p. 4, Long et al., 2000, p. 191, Saunders et al, 2009, p. 108). Epistemology refers to “the basis of knowledge and in what manner knowledge can be transmitted to others (Long et al., 2000, p. 190)”. Ontology regards “assumptions held about the nature of social reality (Long et al., 2000, p. 190)”.

3.1.2 Ontological position of Constructivism

This thesis is aimed at gaining understanding about the puzzling and dynamic nature of stakeholders’ requirements throughout the life of a project. Our comprehension of the nature of projects and stakeholder requirements leads to our preconception that the social order of projects is in a continuous state of change (Bryman & Bell, 2011, p.21). Projects nowadays often utilize flexibility and as a result, project baselines undergo constant renewing, reviewing, revoking and revision to meet demands posed by a continuously changing environment (shown in section.2.5). Even though objective reality in the form pre-set rules, procedures, established plans and baselines exist and shape the perspectives of social actors (stakeholders), it only acts as a point of reference (Bryman & Bell, 2011, p.22). We believe stakeholders’ awareness of a project continuously increases and their requirements are formed continuously (shown in section 2.4). We therefore cohere to the ontological stance of constructivism or constructionism, which emphasizes that social phenomena are not only constantly being achieved by human beings, but are also constructed through social interplay causing reality to be in a continuous state of revision (Bryman & Bell, 2011, p. 22).
3.1.2 Epistemological position of Interpretivism

Epistemology is concerned with investigation of how theories come about and questions what is regarded as acceptable knowledge in a discipline (Bryman & Bell, 2011, p.16). To achieve the aim of this research, which is to gain deep knowledge about materialization of emergent requirements of stakeholders and how to manage them; the understanding of in-depth subjective perspectives of social actors of interest is needed. The epistemology of interpretivism is based on prioritization of subjective meanings through which humans construct and reconstruct their reality and points to the understanding rather than explanation of human behavior by interpretation and contextualization. It is based on constructive ontology and is usually qualitative and not generalizable (Bryman & Bell, 2011, p.19).

Our research is based on a multi-company project case study and respondents with different roles and responsibilities, at different periods of the project life cycle and therefore with different perceptions in relation the reality we aim to examine, will be selected for interviews. In the process of understanding subjective replies of these respondents, we acknowledge that our interpretation of the data is likely to influence resulting conclusions (Snape & Spencer, 2003, p. 13). Ergo, our epistemological position is in line with the philosophies of interpretivism, which permits subjective interpretation of social acts by authors (Bryman, & Bell, 2011, p. 17, Saunders et al, 2009, p. 116).

3.2 Research strategy/approach

In essence, this research was a social inquest to acquire knowledge about stakeholders in the Scandinavian setting of project management. As the ambition of the study was to thoroughly investigate so as to gain phenomenal insight and revelation about how emergent requirements of stakeholders materialize and are how they are managed in projects, intimate examination of the real life context of the project was necessary (Robson, 2002, p.52; Morgan & Smircich, 1980, p.419). Different research topics call for different methodologies (Bryman & Bell, 2011, p.413; Long et al., 2000, p.194). Bouchard Jr. (1976, p.402) argued, “Good research should not be focused on choosing the right method but rather on asking the right question and using the method that has the most potential to accurately answer that question”.

Qualitative research has been proven appropriate for study of concepts that are not well understood as this type of analysis offers the opportunity to explicate complex social processes in a way that quantitative data cannot easily reveal (Edmonson & McManus, 2007, p.1155; Eisenhardt & Graebner, 2000, p.26). Quantitative research on the other hand has been proven suitable for examination of mature theories and for studies where quantification of gathered statistics and analysis is emphasized (Bryman & Bell, 2011, p. 26; Edmonson & McManus, 2007, p.1159). Ergo, to answer our research question that probes into and seeks to improve understanding of a relatively nascent concept, a qualitative approach and case – centered technique is found to be the most powerful and adequate investigative tool to adopt to permit scrutiny of the phenomenon of interest. The
ground for knowledge of our research is therefore engraved in the projected reality of stakeholders.

The chosen method is consistent with our epistemological perspective that valid information from social conduct, which is a large part of stakeholder management, should arise from a subjective orientation where the phenomenon is studied through insightful observation of its social world and not solely through the use of natural science methods that assumes reality as a concrete structure (Long et al., 2000, p. 191; Fromm, 1955, p.114; Morgan & Smircich, 1980, p.492). Our study mainly investigates a concept that has not been sufficiently addressed in literature to generate resulting findings with prospect to contribute useful information, which can be used to inform or update theory. The approach best suited for this process is therefore the inductive approach. Inductive theory development is generally associated with qualitative methodology whilst quantitative methodology is usually reserved for use in theory testing (Bryman & Bell, 2011, p.410; Long et al., 2000, p.195). The theory building approach is warranted in this case because consequential concepts emerge out of data collection, contrary to a case where theoretical work leads the collection of data (Bryman & Bell, 2011, p.410).

3.2.1 Case study design

Our research is conducted in the field of project management and has a focus on emergent requirements of stakeholders in the Scandinavian management context. The case chosen for this research is Umeå wastewater treatment plant project: the largest investment and ongoing project in UMEVA (Umeå water and waste AB), which involves a number of external companies mostly employed as consultants. This case is considered longitudinal and a good representation (Bryman & Bell, 2011, p. 62) of a successful project in Sweden, which forms part of the geographical location of interest in our research. Data was therefore collected and analyzed from this specific project because it offered the opportunity to have access to different managers from UMEVA as well as different participating companies, who are likely to have successfully dealt with changing requirements of stakeholders at different phases of the project. The project was therefore seen as one with capability to be revelatory in terms of the phenomenon under study. Bryman & Bell (2011, p.62) argue that generally, a qualitative case study research “carried out with a predominantly inductive approach to theory treats single case studies as broadly revelatory”.

Emphasis of the case study design is on the rich and real-life context in which the phenomenon under investigation occurs (Eisenhardt and Graebner, 2007, p. 25). Case studies are particularly preferred and are frequently used in exploratory and explanatory studies as they typically answer questions of “how” and “why” in underexplored areas of research (Eisenhardt and Graebner, 2007, p. 26, Edmondson & McManus, 2007, p. 1158, Saunders et al., 2009, p. 146). This is because case studies facilitate freedom, which diminishes bureaucracies and promotes innovation in choice of generating data and therefore provides a holistic and systemic approach picture with a limitless number of interrelated variables (Gummeson, 2007, p. 229). Qualitative research, the methodology adopted in this study, is positively associated with the authors’ case study design choice; as rigorous and detailed examination of a case can be extracted through interviews, participant
observations and also data sources such as archives, surveys and ethnographies (Bryman & Bell, 2011, p.60)

3.2.1.1 Limitations of Case study design

In spite of the popularity and versatility of the case study design, its advocates acknowledge that there are challenges associated with this research strategy, some of which have emerged with the increase of research resting on qualitative information (Eisenhardt and Graebner, 2007, p. 30). A single case study usually provides a good opportunity to investigate an important phenomenon under infrequent or even extreme conditions (Eisenhardt and Graebner, 2007, p. 27). However, even thorough descriptions and analysis of an existent phenomenon obtained based on one case, is seen by critics as deficient in scientific value and non-generalizable (Siggelkow, 2007, p. 23, Saunders et al., 2009, p. 147). These critics challenge the scientific value of case studies by arguing that it is solely conceptual, lacking in rigor and offers evidence that cannot be generalized as it is frequently anecdotal (Lukka & Kasanen, 1995, p. 71; Gummeson, 2007, p. 228).

Eisenhardt & Graebner (2007, p. 27) assert that theory is better supported, more precise and more generalizable when it is based on manifold case experiments and not only on a single case study. They also argue that the multiple cases approach contributes to creation of more robust theory with profoundly grounded propositions in diverse empirical evidence. In contrast, Lukka & Kasanen (1995, p. 76) argue that a case study that is conducted accurately and is of high quality can result generalizable outcomes. Controversially, researchers of multiple case studies maintain only the relationships that are repeated across most or even all of the cases. Since these relationships are usually fewer than the details in richly investigated single case study, the resulting theory is frequently more parsimonious (Eisenhardt & Graebner, 2007, p. 30). Researchers of single case studies, on the other hand, can fit their theory accurately to numerous details of a specific case indicating that single case studies are capable of creating more complex theories compared to multiple case studies.

Considering a case study as a multidimensional observation (Eisenhardt and Graebner, 2007, p. 28, Saunders et al., 2009, p. 146), complementary data such as, company reports, archives and other documentation could have been used to support and add to credibility of the research. However, such complementary data was not considered insightful in this research, as the answer to our research question does not practically lie in already established documentation, but in the changing nature of the social world and its actors in the field of the research.
3.3 Research Design and Data Collection

3.3.1 Acquisition of theoretical frame of reference (Eligibility criteria)

In order to make sense out of the examination of the authors’ subject of interest, as well as resultant findings from data, a theoretical foundation from relevant and appropriate literature is indispensable. Review of existing literature is also necessary to avoid “reinventing the wheel” (Bryman & Bell, 2011, p. 91). As a critical part of every research, literature review includes not only the sources relevant to the topic, but also literature regarding the research methodology and techniques for gathering data (Hart, 2001, p. 2). Literature search was therefore done in two main areas: in the field of interested topic and in research methodology.

Majority of information used in this research and literature review was retrieved from databases including EBSCOhost, Science direct and JSTOR; accessed from electronic libraries of Umeå University and Heriot Watt University using keywords and search phrases such as “successful stakeholder management”, “stakeholder requirements”, “project participants”, “project stakeholder manag**”, “project success”, “requirement management” and “stakeholder expectations”. Common engines like Google scholar was employed in a similar manner to access well regarded project management journals frequently cited in this discipline; and recognized bodies of knowledge from reputable organizations such as Association of Project Managers (APM), International Project Management Association (IPMA) and Project Management Institute (PMI) were constantly referred to. Additionally, in-text references with interesting ideas from papers under review were followed up and academic articles and books in business research were used to obtain information about research methodology. Search results included academic papers of projects in different industries and these were used to guarantee a more holistic view and comprehensive comparisons.

The next step in our mode of selection involved analysis of abstracts of search results to ascertain relevance of article to the topic under investigation. After this step, chosen literatures, which were grouped under themes of stakeholder management, requirement elicitation, emergent requirements, project environment and research methodology were assessed and relevant ideas were then included in the frame of reference to guide understanding of the research. Secondary references are not used in the thesis to avoid misinterpretation of the original sources. In the end, literature obtained covered different fields including project management, change management, construction, information technology and psychology.

3.3.2 Sampling Strategy

Based on the nature of our research question, the case to be studied was deliberately selected to secure availability of important information needed to answer the research question (Maxwell, 1997, p. 87). Purposive sampling is a technique mainly used in qualitative studies as it enables researchers to select particular cases that are able to
especially answer their research question and meet their objectives (Teddle & Yu, 2007, p. 77, Saunders et al, 2009, p. 237). Purposive sampling was therefore the technique used for selection of the most suitable option for our study, from a population of current projects in project based organizations in Sweden.

Convenience sampling involves drawing samples that are prepared to take part in a study, and is accessible without much difficulty (Bryman & Bell, 2011, p.190; Teddlie & Yu, 2007, p. 78). Our choice of Umeå waste water treatment plant project (On 2015) was also motivated by the convenience factors of easy access to UMEVA, proximity and willingness of participants to partake in our research. As UMEVA is a public company owned by Umeå municipality, it was comparatively easy to access stakeholders of this organization and participants were free and willing to reveal information and data that may in other cases be considered confidential.

Furthermore, the chosen case meets the criteria used to qualify a project for our study. First, Ön 2050 is situated in Sweden, which forms part of the geographical location of interest, thus the Scandinavian area. Secondly, the project involves diverse actors from companies external to UMEVA and therefore offers the opportunity to obtain information on the topic of interest from different viewpoints.

3.3.3 Respondent sample criteria

Respondents of our case study were carefully and purposefully selected to include only those with prospect to give valuable and professional insight about management of stakeholder requirements. We were also vigilant to exclude respondents likely to only give tangent information that may deviate from the focus of our research. The following criteria were therefore used as a guide for selection of respondents to enhance accuracy and quality of answers.

**Criterion 1: English speaking**

Taking into account that we as interviewers do not speak and understand Swedish, it is necessary to choose respondents who are able to easily share and exchange information in a language common to both parties. It is therefore important that chosen respondents are able to and also fairly comfortable with communication in English during the interviews.

**Criterion 2: High level of knowledge and involvement in different phases of the project**

The chosen case involved internal stakeholders from different functional parts of the company and various external stakeholders from different organizations representing different hierarchical levels. We therefore had to sieve through this large number of stakeholders to ensure that only the participants with both high level of knowledge and involvement in different stages of the project were interviewed to get rich insights from different perspectives. To fulfill this criterion, we adopted the approach of snowball sampling where initial contact is made with a key stakeholder and this contact was used to establish contact with other equally important participants of the project (Bryman & Bell,
In our case the first point of contact was Petter Bjorkman from Ramboll who referred us to Anna Carlsson - the project manager of the client company UMEVA and the same process was used to reach other highly recommended interviewees.

**Criterion 3: Managerial and decision making position in the project.**

As the intent of the study is to realize how emergent requirements of stakeholders materialize and are managed, it is relevant that respondents from whom insights are solicited are in a position to understand stakeholder management from practice. Therefore an important requirement for our study is that participants should be in a managerial position or in a position where he/she is involved in decision-making. The snowball approach (Bryman & Bell, 2011, p.192) discussed in criterion 2 was useful in selection of respondents who meet this criterion.

### 3.3.4 Companies and interview respondents

#### 3.3.4.1 Companies

The Umeå wastewater treatment plant project, also referred as Ön 2050, is a large multi-company project. In multi-company projects, the project perspective is expanded to involve companies that contribute major content (Baker, 2009, p.2). Beyond the project customer UMEVA, other companies were employed for different services at different phases of the project such as feasibility and design expertise, construction, and health and safety management. For this thesis, primary qualitative data was collected from direct interrogation of stakeholders from the different companies outlined in the table below.

<table>
<thead>
<tr>
<th>Company</th>
<th>Organizational services</th>
<th>Services in project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UMEVA</strong></td>
<td>Provision of safe and high quality drinking water as well as management of waste in environmentally friendly way, for citizens of Umeå Municipality.</td>
<td>Project Owner/Customer</td>
</tr>
<tr>
<td><strong>Ramboll</strong></td>
<td>Design and management consultancy</td>
<td>Design management-Feasibility study, consultancy and early stage conceptual design of wastewater plant.</td>
</tr>
<tr>
<td><strong>EVT Umeå AB</strong></td>
<td>Construction and technical consultancy</td>
<td>Construction management and consultancy.</td>
</tr>
<tr>
<td><strong>FAVEO</strong></td>
<td>Project management, development and specialist services.</td>
<td>Construction management,</td>
</tr>
</tbody>
</table>
consultancy and health and safety management.

Table 1 Respondent companies and services provided

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Job Title in Project</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna Carlsson</td>
<td>Project Manager</td>
<td>UMEVA</td>
</tr>
<tr>
<td>Daniel</td>
<td>Project Leader (Production)</td>
<td>UMEVA</td>
</tr>
<tr>
<td>Petter Bjorkman</td>
<td>Design manager</td>
<td>Ramboll</td>
</tr>
<tr>
<td>Steffan Eriksson</td>
<td>Construction manager</td>
<td>EVT Umeå AB</td>
</tr>
<tr>
<td>Mattias Morin</td>
<td>Construction, Health and Safety Manager</td>
<td>Faveo Projektledning</td>
</tr>
</tbody>
</table>

Table 2 Key stakeholders from UMEVA and external companies

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Job Title in Project</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna Carlsson</td>
<td>Project Manager</td>
<td>UMEVA</td>
</tr>
<tr>
<td>Daniel</td>
<td>Project Leader (Production)</td>
<td>UMEVA</td>
</tr>
<tr>
<td>Petter Bjorkman</td>
<td>Design manager</td>
<td>Ramboll</td>
</tr>
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</tr>
</tbody>
</table>

3.3.4.2 Interview respondents

As mentioned in the segment about respondent criteria (section, 3.3.3), interviewees were chosen based on their level of involvement, and their capacity to manage or influence management of stakeholder requirements in the project. Using these conditions, key stakeholders from the client company, UMEVA and also from external companies were selected and are outlined in the table below.

3.3.5 Semi – Structured interviews

Interviewing is possibly the most commonly employed method in qualitative research because of the level of flexibility associated with it (Bryman & Bell, 2011, p. 465). Interviews enable collection of valid and trustworthy data appropriate to research questions and objectives (Saunders et al., 2009, p. 318). The main types of interviews discerned in literature are: structured (standardized), semi-structured and in-depth (non standardized) interviews (Saunders et al., 2009, p. 320). While structured interviews are used for gathering of quantifiable data and are often referred to as quantitative research interviews, semi-structured and unstructured interviews have a focus on detailed answers and are often referred to as qualitative interviews (Bryman & Bell, 2011, p. 465; Saunders et al., 2009, p. 320).

In this study, primary data is accumulated firsthand by direct interrogation of key stakeholders through semi-structured interviews. Semi-structured interviews give interviewers control over the structure of the interview and the power to steer the discussion to desired direction using follow up questions while offering interviewees the freedom and flexibility to delve deep into the subject of enquiry (Bryman & Bell, 2011, p. 467). Although semi-structured interviews make use of an interview guide, the interviewer is not
obliged to follow the exact structure outlined and questions not included in this guide can still be asked. The research question can therefore be further explored in a way that structured interviews, an approach that restraints flexibility, cannot (Bryman & Bell, 2011, p. 467, Grix, 2001, p. 76; Saunders et al., 2009, p. 320).

Interviews are a very efficient way to collect data particularly when the interested phenomenon is rare (Eisenhardt and Graebner, 2007, p. 27), however, data obtained from interviews in case studies can be deemed erroneous as they can be considered biased. As effort to mitigate downsides of employing interviews in case study research design, authors suggest using various and knowledgeable informants who view the central phenomenon from different perspectives. These respondents can include representatives of different hierarchical levels, functional parts, groups of the organization, as well as actors from other relevant companies (Eisenhardt and Graebner, 2007, p. 27). Accordingly, in the data gathering process of this research, we interviewed respondents from different hierachal level and functional parts in the client organization, UMEVA as well as respondents from external companies.

3.3.5.1 Interview themes

An interview guide was used during the semi-structured interviews to aid in navigation of the dialogue towards the core of topic of interest. This interview guide, displayed in Appendix I, is divided into three sections with themes comprising introduction, stakeholder management and stakeholder requirements management.

Theme 1: Introduction

This section is focused on introducing the interviewee, the company he/she represents, and the role this participant plays in the project. Discussion in this section predominantly concerns purpose and overview of the project, the period participating organization and participant themselves joined the project and the length of their contact with the project thus, whether they will be involved until project closeout.

Theme 2: Stakeholder management

The discussion in this section is about techniques used by participants’ to confirm whom they consider stakeholders in the Ön 2050 project and who matters? Interviewees were asked about the criteria used for identification and prioritization out of the pool of potential stakeholders in this project. The critical success factors considered vital to the project beyond the iron triangle of time, cost and quality is another subject of discussion in this section.

Theme 3: Stakeholder requirements elicitation and management

This section addresses the main topic of interest. Probing questions in relation to elicitation as well as the evolving nature of requirements of stakeholders were deeply explored. Specific questions to inquire about exact instances where emergent requirements are...
noticed to have materialized and how these issues are managed were asked. Interviewers often paused in this section to encourage respondents to reflect and elaborate on answers as a measure to gain more insight. Unclear answers were clarified with interpreting questions to explain and ensure that the interviewer understands the intended meaning of responses from interviewee.

3.3.5.2 Interview process

In qualitative research, the types of questions asked are extremely variable. The first questions asked are of an introductory nature (Bryman & Bell, 2011, p. 477) to allow researchers to get familiar not only with the project itself, but also the roles of the interviewees and the experiences they have in the project. Thereafter, if required, follow-up questions to elaborate on answers are asked (Bryman & Bell, 2011, p. 477) in order to gain more insight for our research objective and question. Follow-up questions to gain richer understanding are necessary as our research is of an explorative nature, and this is appropriate when using semi-structured interviews (Saunders et al., 2009, p. 322). For the purpose of clarification and to permit increased understanding, interview questions and a brief introduction of the research objective were first sent not only to our supervisor, but also the respondents involved in the project of our study. The aim was to ensure that the questions are clear to all respondents. None of the contacts required any amendments; hence we used the initial list of the questions in the interview guide shown in Appendix I.

For our study, five stakeholders of the project of interest were interviewed. The interviewees were all from managerial positions, which ensured that information retrieved, would be comparable. Though they are all involved in the project, they represent different companies. As shown in the tables 2, among the respondents are two people from the client company “UMEVA”-Anna Carlsson who is the project manager and Daniel Fredlander as a project leader. The other three interviewees are from different companies contracted to the project at different phases. They are: Petter Bjorkman representing “Ramboll”, Stefan Eriksson from “EVT” and Mattias Morin from “Faveo”. More details regarding the respondents are shown in table 3.

The respondents were kind enough to acquaint us with the progress of the project, the operation process of the wastewater treatment plant, terminologies, etc. Based on the questions sent beforehand, the project manager Anna Carlsson made special presentation unfolding information about the company and describing the progress of the project from the initial phase up to date and the expected outcome by project closure. This helped to increase our awareness of the project and the company as a whole. Furthermore, to help us gain a better understanding of the operation process of the wastewater treatment plant, Stefan Eriksson, an interviewee, took us around and explained the stages and process of wastewater treatment to us. In addition to this, we had the opportunity to also explore the old plant accompanied by another interviewee, Mattias Morin.

Semi-structured interviews are mostly conducted on a face-to-face basis. Interviews by telephone or electronically via the Internet are also appropriate for this type of interviews (Saunders et al., 2009, p 348.). In our case, we conducted three face-to-face interviews,
which gave us an opportunity to observe participants’ body language and gestures in order to communicate more efficiently. Another interview was conducted by telephone and one via email. Personal preferences of all the interviewees concerning location and time for conducting interviews were adhered to. Though Saunders et al., 2009 (p. 349) argue that when conducting interviews by telephone, the interviewee may be less willing and may hold back from providing as much time to talk, compared with a face-to-face interview, we did not experience this during our interview with Petter Bjorkman. However, we did not have an opportunity to observe the non-verbal behavior of our participant, which is considered as one of the drawbacks of telephone interviews (Saunders et al., 2009, p. 349).

3.3.5.3 Interview limitations

Some limitations faced during the project include, access to some respondents - as one of our criteria for choosing respondents is that the respondent must be in a management or decision making position; some of these stakeholders are very preoccupied with activities at work and they were therefore quite hard to track in order to set a time to meet. Fortunately we were able to schedule and have meetings with four out of five respondents. The last respondent was interviewed through email communications. We believe using another medium for instance face to face or via phone would have led to more insight from this particular stakeholder. Also as the respondents were chosen only in managerial positions, insights from other stakeholders about how emergent requirement were managed (and if they were satisfied – to give an indication of how effective this management was) was lost in our research. This part was not pursued due to the nature of our research question, as we thought it would be best to ask this caliber of people in a project as they are in position to deal with these changes and would therefore be able to provide firsthand and relevant information in regards to this situation.

Another limitation was language barrier. The interviews were conducted in English, which is not a first language for any of our respondents though all respondents spoke English on the level of conversational English or higher. The respondents themselves admitted the difficulty they face to express their thoughts and communicate in a non-native language. Some of them found it difficult to completely understand certain question and we had to explain and clarify to ensure that the scope of the questions is understood fully. However, some still didn’t fully understand and deviated from the core of the question at times. And vice versa, if we were not able to get the meaning of the answer we tried to clarify the responses. Though the questions were answered in an insightful way the interviewees would have felt more comfortable replying in their native language, which may have enabled us to get more detailed information. Also in relation to this language problem, we were informed some of the stakeholders might not be comfortable in communicating with us on a research study level, as they feel somewhat embarrassed to do so.
3.3.6. Non-responsive analysis (problems of non-response)

Initially, this study was anticipated to be a multi-case study that was to include cases from projects that emphasized flexibility. This was to be done to permit comparisons between these kind of projects and more restricted projects. We explored different projects in Sweden and contacted ten companies at the beginning phase of our research through emails. Out of the ten companies contacted, we had immediate positive response from two companies and upon follow up through emails and phone calls; we received feedback from seven other companies. We were unable to reach and therefore received no feedback at all from only one company. The difficulty in reaching and gaining support to conduct our study is attributed to several factors.

Out of the seven companies that were followed-up, we received positive response and support of one company. We therefore scheduled and conducted interviews with the project manager of that company. As we relied on the snowball approach, this project manager referred us to other keys stakeholders. However, referred stakeholders were not readily available to participate in our study within the needed time frame, as they were overwhelmed with work. Even though we had interesting insights from this project, interview from one stakeholder was not enough to make conclusive inferences; hence, this data was excluded from our research results. Also, through correspondence with our point of contact in one of the two companies that gave immediate positive response, we discovered that the particular project of interest was not at a stage where rich insight could be retrieved concerning emergent requirements of stakeholders. The project was at a very early stage and didn’t have prospect to add value to our study.

Also, we had communication difficulties stemming from language barrier with our point of contact in another company making that specific project hard to pursue. In another company, we received positive response but unfortunately at a time dangerously close to the deadline for our research and we therefore had to forfeit the opportunity of involving this project in our research. In other instances, even though we received response, we were constantly referred to other personnel until we reached the right people with prospect to give quality insight concerning our topic of interest. Some of these stakeholders were unreachable and others asked that we contact them at a later time but were unfortunately unreachable after a while. As we were interested in interviewing personnel in managerial and decision-making positions of projects in the organization, we suppose these personnel have very tight schedules and were therefore unable to spare the time to participate in our study given our limited time frame.

3.3.7. Ethical considerations

Research should be conducted in a way that respects human dignity, always observes human rights and weighs risks against the scientific advantage. One of the most important aspects of research ethics is how the participants as subjects of the research are treated. They should be protected from any kind of harm and wrongs while participating in the research including any harm of stress and any threat to their future employment or career prospects. The lack of informed consent should also be avoided during the research
Respondents’ participation should be voluntary and their rights as private individuals should be considered and respected (ESOMAR, n.d, p.4).

Semi-structured interviews were conducted during the research and were handled in an appropriate manner that respects all ethical principles. The respondents were informed that after final approval, the thesis would be available on the Internet as a public document. Therefore, following ethical principles and to assure that these principles are met; interviewees were informed of their right of anonymity and confidentiality during the data collection process and that their responses will be used solely for research purposes. UMEVA, the main organization of the project under study is a public company and is therefore transparent and open for observations by interested parties of the society. This being the case, all respondents gave their consent on revealing their details in the research. So as to not inconvenience our respondents, the decision of location and time for interviews were chosen solely by the respondents. For example Anna Carlsson, the project manager, Stefan Eriksson, construction manager and Mattias Morin, construction and health and safety manager, preferred interviews in person at their workplace, where they felt most comfortable; while Petter Bjorkman was interviewed on the phone. Daniel Fredlander, project leader of Ön 2050, preferred to answer our questions by email and to clarify the answers also by email. Interview questions with the research topic and objectives were also sent to the respondents prior to the interviews to further signify consent and to respect the privacy rights of the interviewees, permission was first sought before recordings of the interviews were done.

3.3.8 Reliability and validity of research results

Reliability and validity of results have been established as the primary criteria for assessment of quality of study both for quantitative and qualitative research (Mason, 1996, p. 24). In qualitative research, altered meanings of these criteria can be discerned. One of such complementary meanings proposed for assessing qualitative study is trustworthiness and authenticity (Guba & Lincoln, 1994, p. 114). Trustworthiness addresses credibility, dependability, transferability and conformability of research results, thus, it demonstrates its validity and reliability (Bryman & Bell, 2011, p.395). Authenticity on the other hand, emphasizes the broad impact of the research in the environment where study was conducted (Bryman & Bell, 2011, p.399). One factor used to determine authenticity is fairness, which is concerned with the degree to which different viewpoints have been justly represented in the study.

To support the credibility of our findings, a documented report outlining our interpretations and impressions from conducted interviews was presented to interviewed respondents for evaluation, review and approval so as to corroborate our interpretations of data and the perspectives of research participants. Feedback from this exercise was used to make minor improvements and the revised findings have been used in the analysis chapter of this paper (Chapter 4). The respondent confirmations therefore verify internal validity of our results. Secondly, to enhance the possibility of replicating this research, we have provided a detailed description in (Section 5.1) of the setting where this study was executed. It should
however be noted that the criterion of transferability is difficult to meet in qualitative research and particularly in case studies because it is not practicable to duplicate a social milieu with a specific context (Bryman & Bell, 2011, p.398).

Dependability and conformability of results involves review of different phases of the entire work to determine if conclusions are justified. This practice parallels reliability and is therefore valuable in qualitative studies, however, this criteria is not a universal approach, as it is rather demanding for auditors because of large datasets produced by such studies. Nevertheless, as we worked very closely with our supervisor, data and results were reviewed and necessary improvements were made to increase the reliability of our study.

To address authenticity specifically fairness, it has been mentioned in the respondent criteria section (Section 3.3.3) that only stakeholders with managerial or in decision making positions were interviewed for our research. This criterion was befitting because our study seeks to understand how requirements that emerge during the project were managed. To find reliable answers, it was deemed necessary to interview responsible parties that are continuously in the position to handle this challenge. Yet, different perceptions and accounts from other stakeholders on how these requirements were managed could have added interesting insights to the study and possibly enriched the overall quality, but given constraints of time and availability, this was not possible and has therefore been outlined in the limitation section of this paper (Section 5.4).

**3.3.9 Research purpose and data processing**

Three categories of research purpose, i.e, exploratory, descriptive as well as explanatory are the most frequently used in the literature of research methods (Saunders et al., 2009, p. 139, Yin, 2009, p.6). While the aim of descriptive study is ‘to portray an accurate profile of persons, events or situations’ (Robson, 2002, p.59), the goal of an exploratory study is to find out ‘what is happening; to seek new insights; to ask questions and to assess phenomena in a new light’ (Robson, 2002, p.59). Explorative research is particularly aimed at clarifying the researcher’s understanding of a problem and its nature (Saunders et al., 2009, p. 139). On the other hand the focus of explanatory study is on the clarifications of the interactions between variables (Saunders et al., 2009, p. 140). The nature of our study is exploratory as we seek to find out and gain rich insight about how the emergent requirements of stakeholders come about and how these requirements are managed.

Analyzing case study evidence is considered the most difficult facet of conducting case studies (Yin, 2003, p. 109), especially in qualitative research, which swiftly generates a vast and weighty database in the form of interview transcripts (Bryman & Bell, 2011, p. 571). In order to manage a great amount of gathered information and data, a lot depends on the investigator’s capability of rigorous thinking combined with sufficient presentation of empirical evidence and careful interpretation of alternative meanings. To achieve this, an analytic strategy is required which will help to handle the evidence fairly and generate credible and persuasive conclusions (Yin, 2003, pp. 110, 111). Therefore, three general strategies are recommended. They are “developing a case description”, “thinking about rival explanations” and finally the most preferred one “relying on theoretical propositions”.

30
According to Yin (2003, p.114) the first two strategies are more applicable for research with descriptive or explanatory purposes. In our study the strategy of “relying on theoretical propositions” is pursued as it is best fitted for our explorative research and it can be extremely helpful in guiding a case study that seeks to answer the questions of “how” and “why”. This strategy assumes that the original research purposes and case study design rely on the theory-reflected research question and the reviewed literature. This will lead to the development of the theoretical framework guiding the analysis of the case study (Yin, 2003, p.112). As shown in the next chapter we do not separate the presentation and analysis of the data, in order to avoid undesired repetition and to make the finding combined with the theoretical propositions, easily understandable.
4. Empirical Findings and Analysis

In this chapter, empirical results from this study are presented and assessed. Patterns in findings are gathered into themes and then analyzed for commonalities or deviations from theory in literature. Analyses of these findings form the basis for the conclusion chapter.

4.1 Background of Ön 2050 Project

Within Umeå municipality, there are a total of 19 wastewater treatment plants. The largest plant is located on Ön which translated from Swedish means island. Ön's wastewater treatment plant takes care of wastewater from households and various businesses in Umeå and surrounding villages and is Umeå’s single most important environmental facility. Prior to the Ön 2050 project, the treatment plant was dimensioned for approximately 116,000 people and can manage to purify up to 3600 cubic meters of wastewater per hour. The cleaning is effective and the process can normally remove up to 95 percent of the organic substances and phosphorus in the wastewater. The wastewater treatment plant on Ön includes mechanical, chemical and biological treatment.

4.1.2 Project Overview

Ön 2050 is UMEVA’s largest investment ever. Big changes have been made in the expansion of the wastewater treatment plant from the existing plant (Figure 1) to the new plant (Figure 2). The project was initiated in August 2009 with a budget of SEK 550 million, and is expected to close in fall 2015. The overarching ambition of Ön 2050 project is to meet the increase in wastewater treatment demands expected to arise from an anticipated growth of residents in Umeå to 200,000 by the year 2050. The current treatment plant, before the start of this project, was designed for approximately 116,000 residents and to prepare for this expected increase in population, an immediate scheme for expansion was required.

Aligned with aspirations of politicians, Umeå as city is steadily growing and the existing treatment plant was fast approaching outlined limits and purification requirements set by environmental bodies in the municipality. Hence, the short-term strategy and an equally indispensable objective of the project is to resolve this key issue. Other project goals are: creation of better working environment for employees, increasing energy efficiency of plant, inclusion of a fat and large kitchen waste reception component, reversal of phosphorus from produced sludge and also increasing utilization of biogas.
Figure 2 Old wastewater treatment plant

Source: UMEVA

Figure 3 New wastewater treatment plant

Source: UMEVA
4.1.3 Research participants and their role in Ön 2050.

From interviewing of respondents, the roles of participants and their organizations in Ön 2050 were clearly defined and have been outlined below. Interviewees of our research have been listed in Table 3 and will be referred to by their surnames in the analysis section of this paper.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Role in Project</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna Carlsson</td>
<td>Project Manager</td>
<td>UMEVA</td>
</tr>
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<td>Daniel Fredlander</td>
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<td>Design manager</td>
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<td>Mattias Morin</td>
<td>Construction, Health and Safety Manager</td>
<td>Faveo Projektledning</td>
</tr>
</tbody>
</table>

Table 3 List of respondents' roles and companies

Source: Personal interviews

UMEVA:

Umeå Water and Waste AB, UMEVA, is a municipality owned company funded by taxes. UMEVA is responsible for treatment of water, sewage and waste and recycling in the municipality of Umeå. The company, founded on 1 January 2000 has 115 employees and an estimated turnover of SEK 309 million in 2013. UMEVA owns and operates 10 plants for producing drinking water, 19 sewage plants and 120 stations with 2300 kilometers of pipes for pumping water. The company also collects waste from residents and owns 7 recycling plants for oversized waste in addition to 10 special stations for collection of hazardous waste. The mission of the company is to provide the citizens of Umeå municipality with high quality drinking water and to manage household waste, sewage as well as solid waste and recyclable materials in an environmentally sound manner. Our first respondent from UMEVA, Anna Carlsson is an environmental functional leader in the company and the overall project manager of Ön 2050. The second respondent Daniel Fredlander, is a process engineer in the production department of Umeva and works in Ön 2050 as the project leader.

Ramboll:

Ramboll was contracted by UMEVA in 2009 as a consultant to provide the services of early stage feasibility study, conceptual design and to help with application for environmental permit. The main duty of this company was to provide competencies needed
to produce elaborate designs of the plant in different stages of the project. The organization is still involved in the project but their role has diminished after completion of design phase and beginning of construction phase. The respondent from Ramboll, Mr. Petter Bjorkman, was the design manager of the wastewater treatment plant project (Ön 2050).

**EVT Umeå AB:**

EVT Umeå AB was also procured by UMEVA in 2009 as a consultant and construction company for the project. Currently, the company is at the stage of installation of equipment in the plant and our respondent, Mr. Stefan Eriksson, is the construction manager of the project.

**Faveo Projektledning:**

Faveo is a consulting organization that was contracted by UMEVA to provide assistance with planning and procurement. Different expertise from specific fields of construction from Faveo are involved in Ön 2050. The organization has been involved in the project from the beginning but our respondent, Mattias Morin, joined the project at the construction phase and currently occupies the position of Construction manager and Health and Safety manager of the project.

4.2 Stakeholder Management

The different aspects of stakeholder management are examined in Umeå wastewater treatment plant (Ön 2050) project. As argued by scholars (Bourne & Walker, 2005, p. 657; Jones & Wicks, 1999, p521; Walley, 2013, p 486; Ward & Chapman, 2008, p. 575), stakeholder management is context specific, hence; tools and methods adopted should mirror the specific context. In the case under study – which is in the context of the Scandinavian management, facets of stakeholder management such as identification, prioritization and communication strategy for elicitation of requirements are explored and resultant findings are analyzed.

4.2.1 Identification:

The challenge in identifying stakeholders who affect and can be affected by a project lies in the difficulty of recognizing who influences or is influenced by activities of the project, as unrepresented groups may feel unfairly denied access to benefits (International Finance Corporation, 2007, p.14). However, from correspondence with research participants, it is asserted that the process of identification of most stakeholders is relatively easier in Sweden as parties with the potential to be hidden come to light because of laws and regulations set in the country. For instance, there are strict laws regulating environmental issues, which make this stakeholder impossible to ignore. Also, procurement laws put in place to protect the rights of all bidders of a contract prohibits UMEVA from unexplained and unconvincing dismissal of companies that were unsuccessful in the recruitment process of the project (Carlsson, Eriksson, Morin).
Carlsson instances an occasion where an entrepreneur, whose proposal did not meet UMEVA’s requirements for Ön 2050, almost exercised his right to pursue legal action against the company in court. The company however, managed to control this situation and prevented the potential negative effect this would have had on the schedule and probably reputation of the project. In another instance, a consultant firm, unsuccessful in the procurement process, actually proceeded to legally challenge UMEVA in court on their decision to choose another company - UMEVA won this case but it cost them time. For these reasons, even unsuccessful bidders are identified as relevant stakeholders. These highlighted examples are in accordance with the notion in literature that stakeholders can be identified by their interest in a project, whether the corporation has any corresponding functional interest in them or not (Donaldson, & Preston, 1995, p. 67); and the project manager must be cautious to prevent over narrowing or ignoring of some external stakeholders by paying attention to avoid overlooking these relevant interest parties (International Finance Corporation, 2007, p. 14; Walker et al, 2008a, p. 648).

For the reason that, stakeholder identification is not only concerned with groups or individuals that impact a project, but also parties who are affected by the objectives and outcomes of this endeavor (APM, 2012, p. 116; Beringer et al., 2013, p. 831; Freeman, 1984, p. 46; Harrison et al, 2010, p. 60; International Finance Corporation, 2007, p. 10; Karlsen, 2002, p. 19; Newcombe, 2003, p. 842; PMI, 2013, p. 393; Walker et al., 2008b, p. 73), Morin highlights the need to consider the influence and impact of the project on the immediate users and the company as a whole. In addition Carlsson buttresses the stakeholders who have interest in the project or company (APM, 2012, p.116, Donaldson, & Preston, 1995, p. 67) acknowledging that the persons engaged in the actual work, for example the production team, are influenced by the outcome of the project and have a substantial interest in it therefore they are given great consideration when making decisions. In Ön 2050, a large amount of stakeholders were identified through structured meetings (Bjorkman) implying that identification of stakeholders relies mostly on brainstorming of the project team to discover all appropriate stakeholders that require assessment (Walley, 2013, p. 500). Therefore, the project manager and his team must possess strong intuition and analytical skills in order to accomplish this fundamental task (Walker, et al., 2008a, p. 645; Walley, 2013, p. 500).

The identified stakeholders were differentiated as internal and external interest parties (Carlsson; Freeman, 1984, Newcombe, 2003, p.842; Ward & Chapman, 2008, p.564). External stakeholders are not seen as official members of the project but are considered influential as their cooperation and input is essential (Atkin & Skitmore, 2008, p. 549, Aaltonen, & Kujala, 2010, p. 382, Ward & Chapman, 2008, p. 564). The external stakeholders identified in this project are the environment, the community, politicians, the media, entrepreneurs, neighbors and environmental agencies (as shown in Figure 4) (Carlsson). Internal stakeholders have formal relationships with or are connected to the firm through contracts and therefore directly participate in the decision making process of a project (Newcombe, 2003, p.842; Ward & Chapman, 2008, p.564). The internal stakeholders identified are the project team, politicians, project owners and the production team of UMEVA (as shown in Figure 4) (Carlsson).
From different perspectives, different stakeholders are considered to be key. The participants from external companies of Ön 2050, (EVT, Faveo, Ramboll) share a similar viewpoint regarding the significance of the client, who is generally considered the most important stakeholder of a project, because without support of customers, a project may seize to exist (Karlsen, 2002, p. 22). Taking this into account, the design company considers the client as a priority and consequently prioritizes other key stakeholders according to the recommendations of the customer, who has the power to make final decisions in case of discrepancies (Bjorkman). The construction manager of EVT company Eriksson, on the other hand, puts more emphasis on the designers mentioning that “one of the most important participants are, of course, the designers who make the drawings and design the process”. However, in managing stakeholders, a more ethical approach can be adopted following the principle of managing a project for the value of all its stakeholders, (Carlsson, Freeman et. al., 2007, p. 311, Newcombe, 2003, p 847). Carlsson, the project manager of the client company, who sees the overall picture of the project and considers all the stakeholders essential, employs this approach.

Most of the respondents emphasize not only the importance of the environment as the final beneficiary of the project but also, the production as the end-users is univocally supported.
and highlighted, as they are the parties that adjudge the usefulness of the outcome or product (Bjorkman, Carlsson, Karlsen, 2002, p. 22, Morin). Bjorkman stresses on the fact that although the whole community of Umeå are end users of the final outcome that is the treated water, “the primary end-users are the employers of UMEVA that will work in this facility”. As a representative of the production and involved in the functioning of this department, Fredlander strongly supports the idea of Bjorkman and considers the operational organization as the main stakeholder. The operational organization constitutes the employees with experience of managing a sewage treatment plant who will manage and operate the plant after its completion. Therefore it is essential to involve them in order to take advantage of the pool of rich suggestions and ideas in this area.

The degree of each stakeholder’s engagement, influence and interest changes over different phases of the project, hence it is phase-specific (Aaltonen, & Kujala, 2010, p. 381, Beringer et al., 2013, p. 835, PMI, 2013, p. 406). According to Carlsson, “it is hard to say which one is the most important as there are different angles to different stakeholders”, all stakeholders should be considered in different phases. In the beginning before commence of construction; environmental permit is needed which requires engagement of special agencies. Also at this phase, the neighbors of the island have a heightened voice concerning the resultant noise and smell that comes with such an infrastructure. Correspondingly, the neighbors are prioritized during this period and effort is made to inform them beforehand about the plant (Carlsson, Morin). However, some stakeholders, such as project sponsor are considered relevant and are prioritized throughout different phases of a project as these “interest parties are instrumental in decision-making and are highly affected by project outcome” (Carlsson, PMI, 2013, p. 396). In Ön 2050, Carlsson classifies politicians and the local board under this category of stakeholders as dissatisfaction of politicians can lead to undesired reactions, and the project receives funds only after the approval of the local board.

4.2.3 Communication strategy: Elicitation of requirements

After identifying stakeholders, an equally important succeeding step is the effective engagement of stakeholders through communication (Karlsen, 2002, p.23; PMI, 2013, p.402). Communication should have a focus on exchange and not mere transmission of messages; in order to not just relay information but also to discuss, comprehend and handle interests in a way that engages stakeholders (Bourne and Walker, 2004, p. 234,Carlsson, PMI, 2013, p. 391). If this dialogue is not accomplished, issues of conflicts and distrust may arise and affect the project negatively (Thomson, 2011, p. 71, Jepsen, & Eskerod, 2009, p. 336).

As UMEVA is owned by Umeå municipality, all information about the project is freely accessible and publicly available to interested stakeholders through web pages and media outlets. The project manager has had meetings with the press to answer questions, provide details and address concerns from the public in relation to Ön 2050. Carlsson confirms that there is no predetermined strategy for transmission of information from UMEVA to most external stakeholders. Communication with internal stakeholders is done through presentations at meetings and other forums where concerns and views of the operation
department are discussed. In addition, regular updates on the company’s intranet system are made accessible to all employees of Umeva.

In Sweden, important legal procedures concerning for instance, the environment, are clearly outlined and from experience UMEVA was able to gather requirements in this aspect. Eriksson from EVT in his role as a consultant facilitated effective communication between client company UMEVA and external design company Ramboll. Eriksson acted as a liaison between these companies and drawing on his experience from procurement for almost 30 years, was able to ensure smooth exchange of requirements between these parties. According to Bjorkman, there were two types of meetings involved in communication with the client. Meetings to gather information, and meetings to discuss ideas and make decisions. Bjorkman expressed that elicitation and understanding of what the stakeholder requires is a “tricky issue” that requires constant and effective communication. For him and his team of engineers, design proposals in the form of drawings are in their everyday line of work, however, this may not be easily comprehensible to the client stakeholder and therefore a common language needs to be established to create an environment where smooth communication is achievable. In this project, they adopted the powerful tool of 3D to enhance this process and allow stakeholders to easily visualize the design and structure of the plant before construction. Also designers of Ramboll produce preliminary delivery where client comments and questions are answered and feasible amendments are made. All concerns from these meetings are documented in an organized and systematic way to ensure that all requirements, even those that cannot be incorporated, are saved for future reference.

Morin agrees that elicitation of requirements from stakeholders is a challenging process. As others mentioned, this phase requires numerous meetings to discuss strategies and vision of the project. Drawings and visualizing aids are used to simplify and improve the quality of communication in an attempt to get everyone on the same page as retrieved requirements can be deeply affected if unclear communication exists in a project (Mulla & Girase, 2012, p.51). Nonetheless, according to Morin, “It is still hard to visualize the reality. So even if you have a lot of meetings and discussions and also decisions of how it will be, people still can be disappointed at the results”. But even with that said, he advocates that effort should still be made to communicate through frequent meetings to discuss issues, progress and changes.

Carlsson accepts that as a project manager, she is not equipped with all the technical knowledge and expertise needed to successfully deliver this complex project. She recognizes the importance of the project team and makes use of good interpersonal skills such as ability to build trust, resolve conflicting issues, be sensitive, use active listening skills, be receptive to stakeholder requirements and understand anticipations (PMI, 2013, p. 407; Newcombe, 2003, p 847). Building such good relationships contributes to enhanced communication and consequently, better stakeholder management.
4.3 Materialization and Management of Emergent requirements (Unknown Unknowns)

The environment in which projects take place has been established as one that is dynamic and subject to uncertainties (Hällgren et al., 2012, p.700; Klein et al., 2014, p.5; Kreiner, 2012, p.716; Olsson, 2006, p.67; Pich et al., 2002, p.1019; Thomson, 2011, p.79; Yang et al., 2010, p.300). As a project progresses, stakeholders develop an improved understanding of the project and their own requirements, (Thomson, 2011, p. 69, Ward & Chapman, 2008, p. 565) resulting in continuous evolution of anticipations and requests at different stages in the lifecycle of the project (Dvir & Lechler, 2004; Olsson, 2006, p.69; Thomson, 2011, p.70). On this account, even though projects make use of pre-specified requirements in the planning stage, new requirements or revisions of previous requirements emerge at later stages posing challenges in projects that are ill prepared for such occurrences (Olsson, 2006, p. 68).

The intent of our research is to probe into the case of the UMEVA wastewater treatment plant project (Ön 2050) so as to gain understanding and insight on how these emergent requirements come about and how they are managed during the life cycle of the project. The geographical location of this project setting, Sweden, is of particular interest to the authors as Scandinavian institutes have been recognized as organizations that embrace uncertainty a part of everyday reality.

4.3.1 Reality and implications of emergent requirements

All the respondents (Bjorkman, Carlsson, Eriksson, Fredlander, Morin) indisputably acknowledge the changing nature of stakeholders’ requirements during the project execution phase. According to Eriksson, this is caused by the fact that “from the beginning maybe the client did not understand everything about the project”. Sometimes it is difficult to find out what stakeholders really expect (Jepsen, & Eskerod, 2009, p. 340, Eriksson, Morin). The traditional view of project management assumes that stakeholders are able to identify all of their essential needs at the front phase of the project and the project team is capable of easily understanding these needs (Olsson, 2006, p.66). However, the client gains more knowledge and improves the understanding of their requirements as the project progresses (after the final drawings are presented), compared to the requirement elicitation stage at the initial phase (Eriksson, Morin, Thomson, 2011, p. 69, Ward & Chapman, 2008, p. 565). Though years are spent on planning, changes will still be required as “there is something missing” or “some part will still not work” (Morin). Hence, planning, even after requirements are derived, is an iterative process generating improved proposals from previous plans (Meredith & Mantel Jr., 2009, p.241).

Bjorkman pronounces that changes in the requirements of stakeholders’ happen very often in construction projects. “A lot of money can be saved if the changes are discovered early” and implemented in the design phase (Bjorkman, Olsson, 2006, p. 68). Therefore capturing of requirements at the early stage of a project through effective communication has been identified as an important aspect in managing stakeholders (Carlsson, Eriksson, Olsson, 2006, p.68; Tang & Shen, 2013, p. 513). Nonetheless, some stakeholders especially end-
users have affinity for change requests, regardless of the phase, mainly because these users are not affected, and therefore do not consider consequences of change implementation such as budget implications and scope changes (Olsson, 2006, pp. 68, 72; Karlsen, 2002, p. 19). In this project, changes mostly arise from the production and this is explained by the fact that they are the immediate users and operators of the plant after the handover of the project (Carlsson, Fredlander). One example of such requirements, emerging from the production department, is request for a different brand of valves and switchgear than what was procured. This caused an increase in the budget and in Carlsson’s words “it was costly as they took higher price for a new brand and it was not in the initial proposal” which would have not occurred if the initial tender was followed.

Other relatively minor changes that emerged include change of locking system for safety reasons, need for new roof and change of wall paint in the plant. According to Fredlander, these changes required were mainly as a result of health and safety issues, process-related issues and some were concerning quality of work environment. Though these relatively minor requirements seem to be of a simple technical nature, they have a ripple effect and prove to be truly complex (Morin, Bjorkman). For instance, if the pump is required to be changed, it will cause modifications in the piping, valves, etc. Both Bjorkman and Eriksson assert that initiators of these changes generally have a myopic view of their requests. There are “hidden implications” of emergent changes, but stakeholders “see only a small part of the picture” (Bjorkman). Carlsson also affirms this and remarks that “change brings change”, and even in the instance where change request is declined, “you have to motivate why you say no and that can take a lot of time”. Although some emergent change requirements seem promising, they can still cause many difficulties in later stages such as need for redesign, unproductive work, late delivery, increased expenditure and dissatisfaction of clients (Atkinson et al., 2006, p 689; Bjorkman, Carlsson, Eriksson, Fredlander, Morin, Mulla and Girase, 2012, p. 51; Yu et. al., 2006, p 245). Uncertainty should therefore be evaluated through detailed investigation and strategic analysis of consequences and communicated with the client (Bjorkman).

Despite the fact that some changes implemented at the execution phase of Ön 2050 were strategically important, they were still very costly and complex for the project and would have been preferable at an earlier stage (Carlsson, Eriksson). One example is the replacement of initial short-term heating plan using oil as energy source to the use of district heating which considers the long-term effect on the environment (Carlsson, Fredlander); this change although good for the environment, has a high financial impact on the budget. Another strategic change implemented at a critical phase is mentioned in (section, X). The change regards an emergent need to lift up a building by five meters because of bad conditions in the ground as the land was covered in water (Carlsson, Eriksson, Fredlander). Though these emergent requirements resulting from an unknown-unknown situation was very costly to Umeva, it was strategically important “because if we had continued with the first proposal we would have faced a lot of problems in the construction phase” (Eriksson).

Though there were many requests for changes in this project, not all of them were incorporated. Bjorkman associates this to the firmness of the construction manager in the project, who believes that managers need to find an equilibrium for various needs and
claims of diverse stakeholders during their decision making procedures (Aaltonen, & Kujala, 2010, p. 383, Bjorkman, Eriksson, Newcombe, 2003, p. 842). Bjorkman recommends this approach and continues: “In my experience of other projects where managers where not as firm, there were a lot of changes and budget automatically shoots up”. Carlsson and Morin agree that these changes are always challenging and can affect not only the budget but also time schedule of the project.

Even with this said, the main goal of a project is aimed at carrying out tasks that meet various requirements and anticipations of stakeholders although some of these requirements can result in conflicting issues (International Financial Corporation, 2007, p.13; Newcombe, 2003, p. 843). There is common agreement among the respondents that despite the challenges resulting from emergent requirements of the stakeholders, these changes, implemented during the execution phase, add value to the overall outcome of the project and to all its stakeholders (Carlsson, Bjorkman, Eriksson, Fredlander, Morin), “otherwise we will never do changes” (Morin). According to Fredlander “In some cases, the changes have been absolutely necessary in order to achieve the project goals” and some were meant to contribute to a better working environment, higher quality, etc. As long as the change engages all the affected key stakeholders and leads to their satisfaction it can be considered of as highly valuable (Bjorkman, Eriksson, Morin). Hence, multiple numbers of stakeholders’ needs should be considered and met for sustainable value creation (Carlsson, Freeman et. al., 2007, p. 311).

4.3.1.1 Changes in human resources as a cause of emergent requirements

One cause of emergent requirements at late stages of the project, highlighted by respondents (Bjorkman, Carlsson, Eriksson, Morin) is the effect of changing staff in the company and introduction of new team members to the project. Ön 2050 is an ongoing project that was initiated in 2009. In a project with a 6-year lifespan, Carlsson, project manager from the client company ascertains that old employees are bound to leave the organization within this time frame and new replacement staff will be on boarded to the organization and even the project. Since the beginning of this project, there has been changes in the production team which from the perspective of Carlsson, “This is one of the big things that has changed things during the project, new ways of thinking have been introduced...There are new ideas on how to do things. For example, the production manager is new since almost 2 years. To get a new manager for production during the project, of course has a lot of influence in the project”.

Eriksson also perceives this issue concerning changes in project team members as problematic. He explains his role in managing this challenge by stating “It can be a big problem if you change people. That is maybe one important role for me as I have been in the beginning to remind them of what has been decided before they came in to the project and they have to stick with that and sometimes there has been discussions as well to make some changes - but I spend a lot of time to remind people what has been decided in the beginning.” Though for efficiency reasons, it is necessary that projects are defined clearly in early stage and implemented following the set plans with minimum alterations (Olsson, 2006, p. 68, Eriksson, Morin), the importance of “open-mindedness” should be highlighted
as new people can bring about better and valuable ideas from looking at the project from another perspective (Eriksson).

Bjorkman finds the emergent requirements that result from changes in the workforce of client organization particularly intriguing. He gives an account of possible effects of changes in client organization during the project and states that “This is a very interesting topic because they have had some concerns with decisions we made. When we finalized some issues where we totally agree and have approval on things and now we get questions ‘why did you decide on this?’ This is very interesting because you can be in total agreement with a client in 2012 but 2014, just two years later, they ask same questions and they are not fully happy (Bjorkman)”. In the opinion of Carlsson, it is a very desirable to have the same people working on a project throughout the lifecycle if possible. Carlsson and Fredlander are the two people from UMEVA who have been in the project from the beginning till date and Morin acknowledges the importance of having the same people on a project and remarks “It is a very important thing. Anna has the documents and has been on this for a while so if Anna Carlsson leaves, then its going to be a big problem because she has the history so it is very important that the same people can be maintained because when new people come in they say “why are you doing like this?, I have always done it like this”

4.3.2 Are emergent requirements acceptable at late stages?

The project manager admits that ideally, after a specific stage it is desirable and hoped that no more changes are required. Although the APMBOK (2012, p.129) ascertains that in certain circumstances, it may be appropriate to have a change freeze where no further changes to scope is considered, Carlsson remarks that ‘It would be easier to set that no changes acceptable on 1 January but it is not like that, it is not possible, there are even things lacking in the material, on the designing sheets.” This is because in the real world, there is always a need for change or adjustments (Carlsson, Morin)”.

Eriksson is of the opinion that minor changes can be acceptable at a later stage however, changes in design and the main process at later stages are not desired and should be unacceptable. This perspective is influenced by the fact that contracts are signed which bind participants to certain rules in the project, making changes to this challenging. He exemplifies the case of the big change in the project and comments that “when the main contracts are signed, such a big change like to lift up the whole building is not acceptable, it must have been done before”. Bjorkman is of a similar opinion and states that it is very much dependent on the type of change requested for. He states that small changes like changing the colour of paint can be done in different stages but major changes have to be done much earlier.

In large projects like this involving many contracts, care must be taken in order not to breach agreements. Eriksson advises that at a point changes should not be possible and therefore should be unacceptable. Changes that are possible will cost the client a lot of money and at a certain stage, may even require dissolving of present contract and making of a new contract. However Fredlander, supported by Carlsson, is of the opinion that if a
change is of such a nature that it is a must to secure the purification process to work, “I’ll say there is no deadline for when such a change could be made.”

4.3.3 Management of emergent requirements

In the management of projects, risk management and other conventional approaches are usually employed to prepare for “known-unknowns”. Known unknowns are circumstances where the project team is aware of the possibility of a specific situation, and are therefore able to make approximations and plan contingencies; but do not know whether this probable event will happen (Pich et al, 2002; PMI, 2013, p. 171). In the real world context however, due to uncontrollable and unavoidable elements in the environment of a project, there are circumstances such as those observed in our study, where a number of risks are not known as possibilities and are consequently not planned for. These events are referred to as unknown-unknowns as the project team is unaware that they do not know them. It is stated in literature that, understandably, managers usually feel uncomfortable dealing with such instances, as existing tools do not address them. (Pich et al, 2002, p.1013). In the light of this, planning cannot be used to accurately account for future possibilities (Carlsson, Bjorkman, Meridith & Manter Jr., 2009, 159, Morin).

Emergent requirements bring about a shift in the status quo of a project and therefore instigate change (Bjorkman, Carlsson, Morin). The methodologies used to address them are consequently similar to change control approaches, as managing of emergent requirements (unknown-unknowns) is seen as management of a type of change request. ‘Change control is the process through which all requests to change the baseline scope of a project, programme or portfolio are captured, evaluated and then approved, rejected or deferred (APM, 2013, p.128) ’. First, certain systems are put in place to ensure that events of emergent requirements are manageable. Bjorkman states that Ramboll maintains “a very clear dialogue with clients (UMEVA) that, changes cost money, as no one works for free”. He mentions that in Ön 2050, the clients are professional as they have had experience from other projects and good cooperation between them allows rich communication and understanding of what changes are possible or impossible in the design phase of the project.

Fredlander as well as Morin affirm that, the approach used to manage change requests in the form of emergent requirements depends on the stage of the project in which the requirement materialized. Management action in the planning stage, where modifications are easy to implement, differs from the approach in later phases like construction where deviations from baselines are costly and changes are more challenging to implement. In the design phase of Ön 2050, Ramboll was the party in charge of management of changes in requirements concerning the design. When the client comes up with a new idea or requirement and it is proven feasible to integrate; the cost and time repercussions are fully considered and Ramboll becomes the accountable party for re-planning and implementation of the accepted change.

Beyond this phase, Carlsson, the project manager of Ön 2050 is in charge of managing these changes. Eriksson verifies that the client represented by the project manager, Carlsson
and the project owner represented by the CEO of UMEVA, are responsible for management of all types of changes, emergent or not. However, in his position as a consultant to Umeva, Eriksson works as an intermediary and investigates the viability of accepting emergent requirements that appear in the form of requested amendments or additions. When change needs originating from the clients are brought to his attention, he communicates with contractors to discuss implications on factors such as time and cost. If the client is satisfied with, and is able to handle the effects this change will have on scope, budget and schedule, plans are made to incorporate and implement requests. APM (2013, p.129) states that “If the project has an agreed change budget, it may be in the control of the project manager but if changes are major or cumulatively exceed the budget, then they may have to be escalated to the project sponsor for funding from the management reserve”. In line with this statement, the project manager consults the CEO when the communicated implications on important baselines exceed the available buffer and also in instances where the requests for change is controversial.

The design manager of Ramboll recounted an occasion where a great geotechnical change emerged at a critical time in the project. Ramboll initially worked on a design concept where a building in the plant was low and water was running through it without the need to be pumped. After construction using this design however, it become apparent that although changing at this phase would potentially cost a lot of money, the current status would have lead to momentous consequences. The implications of the previously accepted design was an unknown - unknown, but as the designers (stakeholders) became more aware of the potential havoc this design could cause even though this was after it had been built, the radical yet important change was implemented. The emergent change necessitated the lifting of the entire structure some meters above the ground. Bjorkman and Eriksson are in agreement that implementation of this change was crucial as the condition of the ground, not known at the time to these stakeholders, was not in good shape. An interesting remark made by Eriksson was that this change was done before signing of major contracts, which safeguarded flexibility and contributed to the smooth execution of this emergent change. This concedes the concept in APM (2012, p.129) that “Contract terms will dictate a change control process that governs how the contractor will be paid for changes to the specification on which the original price was agreed.”

It was interesting to observe that as emergent requirements are unknown unknowns, they were not planned for in advance using risk management techniques and this topic did not come up in any of conducted interviews in our study. This goes to show that in the planning stage of Ön 2050, there was room for flexibility using a management reserve, which is a “specified amount of project duration or budget withheld for management control purposes and is reserved for unforeseen work that is within scope of the project (PMI, 2013, 171)”. Management reserves are designed to address “unknown-unknowns” that can affect a project and although not included in cost and schedule baselines, form part of the overall project cost and duration requirements. PMI, 2013 (p. 310) suggests that unknown risks cannot be managed proactively and therefore may be assigned a management reserve, which is in contrast to contingency reserve that covers only the “known-unknowns” and are reflected in the budget baseline. According to Carlsson, the budget was “fluffy” and allowed the needed flexibility to accommodate these uncertainties. From our perspective, although the budget was underspent, the project manager didn’t stress on the negatives of
these changes on the baselines implying that they somewhat know and accept uncertainty as an organizational reality and therefore do not bolt from such occurrences but face it and see how best they can progress and also benefit from the situation. This is a trait associated in literature to the Scandinavian approach of project management (Hällgren & Jacobson, 2014).

Approved changes must be recorded and archived to allow the impact of these changes to be referred to when the need arises. As part of managing these requirements, the emergent changes are documented mostly through protocols and discussions in meetings (Eriksson, Morin). For the discussed big emergent change of lifting the building, all requirements and changes were documented in a protocol that involved the CEO and board of UMEVA (which includes politicians) before the go ahead was given for implementation. A cloud system is also used to make important documentation from the project easily accessible to all participants.

4.3.4 Management “of” versus management “for” stakeholders

Harrison et al (2010) differentiate between management of and management for stakeholders. The authors perceive the approach where stakeholders are allocated more value than which is necessary to simply maintain their willful participation as the approach of management for stakeholders. In the Ön 2050 project, Carlsson expresses that using a strict top down approach is not ideal as “the project was built for stakeholders” and management should therefore be done for the stakeholders focusing on the people. This opinion is unanimously supported by all respondents in our interview who agree that a project is done because the need was initiated by stakeholders to begin with, and therefore they themselves as well as their requirements must be given considerate attention as satisfaction of these interest parties is an important element of project success.

In as much as Morin and Eriksson appreciate the approach of management for stakeholders, they suggest that this type of management is not appropriate for every context. Eriksson, the construction manager, stresses on the need for balance by using the approach of management of stakeholders in concurrence with the approach of management for stakeholders. This is because, in his line of work, it is imperative to be vigilant of cost and budget baselines. He expresses that if both methods are not used in parallel, “the project can continue almost forever and also the cost will increase and there will be a lot of discussions in the end and the politicians and so will ask why could this happen and sometimes it is my role to be difficult to say that we have to stick to the decision we made 5 years ago, if no we will let the project out of control”. This balance in style secures the control needed to influence and direct the project in ways necessary to accomplish performance objectives.

The viewpoint of Morin is in absolute agreement with that of Eriksson. Morin expresses that although management for stakeholders is important, the approach used should be based on context. Therefore stakeholder management is context specific and employed approaches and techniques should reflect this context (Bourne & Walker, 2005, p. 657, Morin, Ward & Chapman, 2008, p. 575). He asserts that in construction phase, it may be
more appropriate to use an approach where stakeholders are organized to proceed towards achieving a required output. In another situation however, for instance in his role as health and safety manager, he adopts the approach of management for stakeholder as in his words “I can’t go and check it for them so there I need people to understand what is important for health and safety so it is both depending on the context”.

4.3.5 Critical success factors of the project

From the perspective of Carlsson, the overall project manager of Ön 2050, the project has to date been very successful. The schedule of the project is on course and from projections; the overall project will finish on time. Also expenditure of the project has not escalated beyond the budget of SEK 550 million (as shown in Figure 5) and current projections show that the project is unlikely to exceed SEK 500 million (as shown in Figure 6).

Figure 5 Estimated budget of Ön 2050

Source: UMEVA
Eriksson, construction manager and an external consultant from EVT, considers the people employed on the project as a critical factor that has effect on success. He stated that, “One critical factor is finding the right people to work with. That might be the most important factor, finding the right people who know what they are doing and who have experience in this type of work”. Fredlander, process engineer of UMEVA who is also the leader of commissioning of the new treatment plant, also shares this point of view. He associates the success of the project till date to the range of skill sets and expertise from external consultants with extensive knowledge in their respective fields. Another factor that has facilitated successful execution of the project, from his perspective, is the clear structure for decision-making, set in place for the project. Nevertheless, in accordance with the perspective prevalent in literature, there is general agreement between all respondents (Bjorkman, Carlsson, Eriksson, Fredlander, Morin) that the acceptance of project outcome by stakeholders and their satisfaction is an imperative element of project success (Boyd, 2001, p.423; Cooke - Davies, 2002, p.185; Davis, 2013, p.193; Hartmann & HeitBrink, 2013, p.354; PMI, 2012, p. 469).

Project success nowadays, is perceived as contingent on the level of satisfaction of stakeholders; as success is represented by stakeholder rating of the degree to which their ambitions have been accomplished (Boyd, 2001,p. 426; Eskerod & Huemann, 2013,p.37; Thomson, 2011, p.71). Bjorkman, design manager from Ramboll, stresses on the
importance of understanding and involving stakeholders in the right way. From his viewpoint, different stakeholders have different visions especially in a project with a long-term strategy and it is therefore vital to elicit and manage these expectations in order to achieve project success. He elaborates by explaining that even though the client, UMEVA, may be seen as one stakeholder, this party is composed of different people with different expectations who have ideas and proposals of what to create beyond obvious objectives. In this project, the general manager of UMEVA had interests in architecture and the creation of a landmark for Umeå. He was also concerned about sustainability and low environmental impact. Another important subgroup of the client stakeholder was the production team in the operations department of UMEVA, who were in essence, primary end users. This team will operate the plant years after completion and their input and ideas are, on that account, of high importance.

The perspective of Bjorkman is in conformity with that of Turner & Zolin (2012; p.88) who propose a model of forecasted success, as they believe success is judged by the impact of the project outcome subsequent months and years after completion and handover. Bjorkman explains that if the production team is not intimately involved in the project, they may end up being unhappy with the end result and success will consequently, be compromised. He expresses his aversion for this type of scenario by saying “that is a situation that I don’t want to be in, we want a situation where operators see the job done as good value for money and the result are what they wanted”. Although Bjorkman supports the proposition of putting weight on understanding and involvement of stakeholders, he cautions about the large wish list and acknowledges that everything on this list cannot be addressed; “As the project has a limited budget, you can never say yes to everything. You always have to compromise, some can be done- some cannot be done for different reasons; technical or economical or time related”. Eriksson also acknowledges that client satisfaction is critical for project success but from his point of view, working hard to reach the environmental protection goals will achieve satisfaction of all stakeholders in the project. Morin, the Health and Safety manager as well as construction supervisor of the project from Faveo, believes that success of a project relies very much on detailed initial planning. According to him, if set frames of time and quality are accurately established, there is a positive consequential effect on the environment and client satisfaction. In his words, “when you plan well, everything follows”.
5. Conclusions

In this chapter, the precise results, thus response to our research question, from our findings are recapped and outlined. The theoretical and practical implication of the study is discussed and concludes with limitations as well as proposals for direction of future research.

5.1 Stakeholder management

Even though the recognition of stakeholders is seen as relatively easy in Sweden owing to the existence of strict laws and regulations, stakeholders’ identification is all the more demanding because project managers must adhere to the broader definition of stakeholders which include parties who are not beneficial to the company, as exemplified by the case of unsuccessful bidders. Prioritization is not a straightforward process either as it is phase-specific. The level of stakeholder engagement as well as influence and interest varies depending on the phase. As a consequence, there is a potential tendency for some parties to not be accounted for in phases where specific stakeholders are highly prioritized. In this project however, the overall project manager was able to have a holistic approach where all stakeholders were acknowledged throughout all phases in the lifecycle of the project. The communication strategy for Ön 2050 was also customized to ensure that the optimal approach is used, depending on the party to be addressed. Expertise from EVT was employed for communication of procurement needs, powerful tools were used to make technical communication easier to grasp and neighbors were addressed by personal communications. In addressing the community through the media, the strategy of “no strategy” was used to ensure that information is authentic, transparent and sincere.

5.2 Materialization of emerging requirements

The findings from this research verify that stakeholder requirements do emerge even at the execution stage of projects, despite careful planning over years. The noticed changes requested, vary from minor charges to critical and strategic changes. The root of emergent requirements in Ön 2050 are traced to three sources outlined below:

1. **Ongoing realization of requirements with increased information**

This source of emergent requirements has been mentioned in literature and was verified in the case of Ön 2050. Stakeholders gain more knowledge about a project as it progresses and as a result, become more aware of their exact needs. In Ön 2050, requirements became clearer after drawings and 3D prototypes were presented, and the modifications requested for at this stage, were easy to inculcate. However, even after this stage, emergent
requirements continued to emerge because clients gain steady information with time and therefore can continuously reshape their wish list. Change requests that materialize from this source are usually strategic and sometimes critical, as witnessed in the case of request to lift up the building and replacement of oil heating with district heating. These emergent requirements should therefore be given significant attention and be treated with careful consideration.

2. Myopic view of stakeholders

Another source of emergence of requirements is the short-term view of some stakeholders, who are not affected by time or monetary constraints of the project. As verified in Ön 2050, the stakeholders who have the most affinity for modifications and adjustments, are end users; who in this case are the production team. Though some changes requested from this source seem to be simple and are classified as minor, they are truly complex and can cause difficulties later. Therefore, careful investigation and analysis of consequences are necessary. Project team members must be educated on repercussions of such minor technical changes in order to broaden their view and prevent unjustified requests for what they might perceive as harmless adjustments.

3. Changes in human resources

The third source identified in this case as a cause of emergent requirements, has to do with changes in the human resource of the organizations involved in the project. It is not an uncommon situation to have employees of an organization progress or pursue their careers in different corporations. In such situations, new personnel are recruited to replace lost staff members and in the case of Ön 2050, a project with duration of 6-years, part of the workforce could not be retained and were therefore replaced with new personnel. As observed in Ön 2050, introduction of a new production manager, in the project whose end-user and prioritized stakeholder is the production department, was bound to have significant influence on the project. New ideas are introduced in the project and these new ideas birth new requirements that suddenly emerge at later stages of a project. Change requests stemming from this source can be strategic or minor and significant attention must be duly given to critical change requests. In order to prevent unnecessary requests, new staff should be constantly updated on process thus far and the reasons why certain decisions have been made to ensure that only new ideas with high potential to add value are escalated to a level where change requests are warranted.

5.3 Management of emergent requirements

Contingencies can only be planned for risks or uncertainties that are known as probable. Emergent requirements bring about changes that are unknown to the project team members and are only revealed after its occurrence due to the dynamic and unpredictable nature of the project environment. These are classified as unknown-unknowns. They are not associated with chances or probabilities and cannot be planned for in advance; and this explains why planning cannot correctly account for all future possibilities. In essence, emergent requirements are perceived as change requests and are therefore managed in a
manner similar to such. The management approach adopted for emergent requirements at an early phase differs from the approach employed at a later stage. Moreover, strategic change requests are managed differently from requests for minor changes.

A comprehensible dialogue about consequences of changes such as effects on cost and time must precede finalization of contracts. This must be done as an attempt to ensure cooperation and discourage unwarranted requests for change. Management of these requirements entails detailed investigation and analysis of first, the possibility of implementation depending on the current stage of the project and then, the long-term implications and possible impacts on schedule and budget. If requested change is within the scope of the project and, outlined repercussions can be stomached by the project sponsor based on management reserve, necessary formalities are followed to commence the implementation of emergent requirements. In the case of our study, emergent strategic requirements were escalated to a higher hierarchical level (CEO or project board), which control the management reserve, for approval and allocation of necessary resources. Minor emergent change requests, on the other hand, depending on project constraints, were managed by the project manager when validated as necessary. Actions taken are thereafter documented and archived for referencing, and to serve as a knowledge base.

Stakeholder acceptance and satisfaction is highlighted as a critical success factor in this project, hence, the level of consideration for emergent requirements is associated to the predominant use of “management for stakeholders” approach by UMEVA. Although it is recommended that the style of “management of” stakeholders should also be used to prevent projects from spanning out of control, there is a need for balance between these two procedures in order to facilitate accomplishment of project objectives, stakeholder satisfaction and consequently, project success.

5.4 Limitations and Suggestions for future research

Although our findings are derived from a reputable company, it is only from one type of industry and country, making results from these findings not generalizable or transferable to other industries and other countries. It is probable that interesting variations could have been found if different companies were investigated, for instance if study was conducted in a private company instead of a public company in this case. Another limitation of this study was the language barrier. Interviews conducted were all done in English language, which is not a native language for any of our respondents. Minor misunderstanding therefore had to be addressed now and again during the research. Furthermore, we, as researchers do not speak or comprehend Swedish and this blocked the opportunity to analyze literature about our area of research that have probably been published in this language. We believe our research could have ben enhanced had it not been for this disadvantage, as more literature especially in regards to this topic in the Scandinavian management context, would have enriched our work. Lastly, our research was conducted from the viewpoint of managers of the project, as the objective was to gain insight concerning how emergent requirements are managed. However, insight from other stakeholders’ aside managers would have been useful to analyze the degree to which their requests are/were met and also uncover from a different perspective, how these emergent requirements happen.
We recommend that future research should examine the subject of interest in a setting dissimilar to ours such as in different industries and/or in different countries to discover if conclusions drawn will be comparable or divergent and to better analyze if findings from this research have potential to be generalizable. Another suggestion for future research is to conduct additional exploration of findings from our study in order to investigate and uncover how these revealed causes of emergent requirements could be controlled and how negative effects from these causes can be minimized. Besides, alternative complementary data such as archives, documents, email communications etc., can be used in the further research to gain more holistic picture of the phenomenon and support the findings of the study. Additionally, quantitative research, involving a large random sample, can be conducted in order to validate our findings especially in relation to the revealed causes of emergent requirements of key stakeholders.

It should be noted that, the aim our thesis was to find out what causes emergent requirements of stakeholders and how these requirements are managed in the Scandinavian context of project management. We by no means claim that our study is representative of the Scandinavian region or even Sweden. The chosen case was driven by our interest not in the specific region but in the particular style of project management. Though some topics such as change management, risk management, leadership styles and other fields made brief appearances, we do not focus on these topics as they are out of scope of this study. We also do not probe into technicalities of wastewater treatment plant, which is irrelevant to the topic of interest, discussed in the thesis.

5.5 Academic and practical implications

The central aim and contribution of this research is acquisition of a better understanding of project actuality in relation to emergent requirements. The research is an attempt to gain findings that enhance the intellectual foundations of the field of project management in terms of practical relevance. Some of the findings from this research are in accordance with, and therefore verifies or reinforces theoretical opinions in literature. Our study supports the theoretical prepositions that emergent requirements do occur as demands and expectations will change or evolve constantly with time (Dvir & Lechler, 2004; Olsson, 2006, p.69; Thomson, 2011, p.70). The empirical evidence is also in line with the preposition that the level of knowledge of the customer increases significantly and their needs are therefore understood much better as the project progresses (Thomson, 2011, p. 69, Ward & Chapman, 2008, p. 565). Other findings from the empirical evidence however, provide new insights that the existing literature does not account for in the context of causes and management of emergent requirements. This research recognizes changing nature of employees in an organization and therefore in a project as a root cause of emergent requirements. Another revealed cause of emergent requirement is in relation to the myopic view of stakeholders. The results from this research also established that management of emergent requirements is dependent on the type of change requests, whether strategic or minor. These findings contribute by way of informing and developing existing theory from rich practical insights in relation to stakeholder management.
This research is conducted from a managerial perspective and the findings are designed to provide valuable practical insight to the managers of projects. In conventional projects, bureaucracies are put in place to curb emergent requests, as they are perceived as threats to scope, budget and schedule. Findings from this research uncover that some emergent requirements may be strategic and critical and therefore practitioners, thus project managers, need to be more flexible when considering these new ideas; as neglect of such changes can have damaging effects on the project. Furthermore, information about root causes of emergent requirements outlined from our findings provide better understanding that can act as a guide when making decisions in regards to this subject. Awareness of the root causes can help managers to set up strategies to minimize occurrence of unpredictable minor change requests that results from the myopic view of stakeholders that lead to further modification requests in different phases of the project. Also, the Scandinavian management approach, which has a predominant approach of “management for stakeholders” serves as fine example of a great mindset to use for management of projects, as the project environment by definition is one of constant change. Accepting this approach will address the discomfort of project managers when dealing with unknowns in projects.
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Personal Communication

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Appendix I Interview guide for UMEVA stakeholders
Materialization and management of emergent requirements of key stakeholders

Interview guide

We are two current international students at Umeå University studying masters in Strategic Project Management. Through our master thesis we are seeking to find out how emergent requirements of key stakeholders come about and how they are managed during the life cycle of the project. With this intention, we would like to kindly ask for permission and availability to conduct interviews with you and possibly other stakeholders involved in UMEVA wastewater treatment plant project to explore how this issue is handled in

Please consider the mentioned questions, as a general guideline for the forthcoming interviews and note that all the data gathered will be used for this research purposes only.

Interview questions

SECTION A - Introductory questions

• What is/was the purpose of the project? (Overview of the project)
• What is your role in your organization and what was your role in the project?
• At what stage did you join the project and were you involved until project closeout?

SECTION B - Stakeholder Management

• Who were the key stakeholders involved in this project?
• Are these key stakeholders internal or external?
• How are these key stakeholders identified and prioritized?
• What were the critical success factors for the project beyond time, cost and quality?

SECTION C - Stakeholder requirements management

• What methodology/ technique and communication strategy is used to elicit requirements from these stakeholders?
• Do stakeholders request for changes in requirements during the project execution phase?
• If yes, what types of changes are requested?
• How are these requested changes from different stakeholder managed?
• Until what stage of the project are changes in requirements acceptable?
• What stage in the project are changes in requirements absolutely unacceptable?
• What challenges do these emergent requirements bring about?
• In your opinion, did these emergent requirements add value to the outcome of the project? - Who benefits from these outcomes?
• Who is/was responsible for managing these changes in requirements?
• In your opinion, was the approach used in managing stakeholders on this project management “of” or management “for” stakeholders?