Closing IT projects
A Swedish public sector perspective

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Jönköping, May 2013
Master Thesis in Informatics

Title: Closing IT projects: A Swedish public sector
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Date: 2013-05-19
Subject terms: IT project, project closure, project management, project manager, public sector

Abstract

The objective of this study was to investigate IT projects within the Swedish public sector. Furthermore we have looked at the project closure in IT projects. The problem that occurs in this topic is that the projects can run overtime or over budget. In this research we used interviews to conduct the data collection. We have collected data from two public sector organizations – Jönköpings kommun and Domstolsverket, both of these organizations have a dedicated IT department. Through the methods, theoretical framework and analysis we found many different activities and theories on how to handle project closure in IT. The main subjects that keep coming up when addressing the problems of project closure are communication and planning. The responsibilities of the project manager are investigated and the focus is on closing an IT project. A descriptive diagram has been created to show what is important during and before project closure.
Acknowledgements

We would like to acknowledge and thank our supervisor Andrea Resmini for effort and guidance with this thesis. We want to thank course manager Christina Keller for unconditionally supporting us during the process of writing this thesis.

We are very grateful to Svein Lister, Christer Boklund and Jan Karlsson Pihl for the privilege of sharing helpful insights with us – without your support we wouldn't have been able to complete this study.

We express our appreciation to Sonia Chivarar for valuable feedback and useful suggestions.

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Jönköping, May 2013
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I Introduction

Keider (1974) writes ‘Some projects never seem to terminate . . . rather, they become like Moses, condemned to wander till the end of their days without seeing the promised land.’ (cited in Keil, 1995).

Project closure refers to the set of activities that are required to formally end the project (Sanghera, 2006). Although a lot has been written about starting and executing the project successfully but closing the project doesn’t find a lot of presence in the project management literature (Hormozi, McMinn & Nzeogwu, 2000; Havila, Medlin & Salmi, 2013). Havila et al. (2013) point out that fewer than 5% pages in a typical literature artifact discuss project closure.

Straw and Ross (2005, p.65) rightly highlight that it is very important ‘knowing when to pull the plug’ for a project. The importance of project closure is captured in the statement – ‘a bungled closure can bungle the project’ (Nicholas, 2001, p. 423). The research for this thesis focusses on the planned closure phase of an IT project in Swedish public sector organization. This thesis concentrates on obtaining a managerial perspective of practicalities in project closure of an IT project.

Many people managing IT projects do perceive it as a very complex matter and do not quite understand IT. This can be a classic problem in an organization or company (Mähring, 2002). There is no direct way to success and IT projects are complex in nature. Executives are naturally part of most projects in any organization because of their position. It is a common problem that executives and managers tend to work with IT projects but in fact do not have the right competence to actually be involved in IT project handling (Mähring, 2002, ch1).

In this thesis the research is done on the last stage of IT project life cycle: the closing phase. The involvement of both employees and managers is very important in the last stage. Often the closure of a project is underestimated. There is not enough time invested in the actual closing of a project or it could be that the project is prematurely closed by a manager (Havila, Medlin, & Salmi, 2013).

Havila et al. (2013) suggest that there is a need for project ending competence i.e. “the ability and skills of the organization and its employees to terminate the project so that internal and external project stakeholders and company relations incur as little harm as possible”.

This topic is already gaining an increased awareness in the research fraternity (Havila et. al, 2013) and many companies and organizations may benefit from having a better closing stage.

As IT projects are very complex and often there are different opinions from stakeholders, managers and users, it is interesting and yet challenging to research the project closure in an IT environment and that too in a public sector organization.
1.1 Background
This section presents a view of the literature on the project, components of project closure and unique features of IT project.

1.1.1 Project
The term ‘project’ finds a lot of different definitions in the project management literature and here are some of them.

Project Management Institute defines a project as:

‘A project is a temporary endeavor undertaken to create a unique product, service, or result.’ (PMI, 2010, p. 5)

Another one from British Standard 6079, 2000:

‘A unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific performance objectives within defined schedule, cost and performance parameters.’ (cited in Maylor, 2010, p. 5)

One more from PRINCE 2 2009:

‘A management environment that is created for the purpose of delivering one or more business products according to a specified business case. And: A temporary organization that is needed to produce a unique and predefined outcome or result at a given time using predetermined resources.’ (cited in Maylor, 2010, p. 5)

And:

‘A project is a one-time, multitask job with a definite starting point, definite ending point, a clearly defined scope of work, a budget and usually a temporary team.’ (Lewis, 2001, p. 5)

Gardiner (2005) gives the reason for so many attempts of defining project – there are so many possible variations from one project to another that it is difficult to have one-for-all definition. Lewis (2001) brings out an interesting point that in real life projects seldom fit into the textual definitions. Maylor (2010) mentions that from various definitions of project three common themes emerge –

Unique – the exact project has not been done before,

Temporary – the project has a beginning and an end and has dedicated financial budget.

Focused – the project is expected to deliver a certain product/service/outcome.

On similar notes, Gardiner (2005) writes that each project has three primary characteristics that set a project apart – each project is a temporary venture undertaken for a limited period of time, each project is unique and each project goes through a process of ‘progressive elaboration’ in which the details are defined and added over time. Cardinal and Marle (2006) mention that a project is a change agent aimed at results. These could be to improve
the performance or to bring out a new product offering or to change the position of the company and so on.

1.1.2 Unique features of IT projects

Fuller, Valacich, and George (2008) write that there are certain factors which differentiate IT projects from other non-IT projects. The rapidly changing technological environment is a unique feature of IT projects. Secondly the challenge of retaining staff due to the changing technologies is another facet of IT projects. A third aspect is that in IT project there is an extensive user involvement. Fourthly, IT projects demand integration of system development methodologies into project management framework.

The fifth unique aspect of IT projects is that the proposed solution may never have been attempted before. A sixth aspect is the complexity arising due to undefined, evolving project scopes which is common to IT projects. Lastly the technologies involved in IT projects may change during the course of the project. Finally Fuller et al. (2008) say that even though the projects may take many forms but the project management is the common factor amongst all.

1.1.3 Components of project closure

Sanghera (2006) and Richman (2012) mention that there are two components of project closure – administrative closure and contract closure. Administrative closure refers to the activities related to getting acceptance for project, quality analysis of the project, maintaining knowledge. The authors elaborate that administrative closure also includes identifying who will perform what task. Sanghera (2006) provides the details of the input to and the output of project closure and the tools & techniques used during the closing process.

The authors write that if there is a contract associated with the project then contract closure is related to settling down the contracts associated with the project. For contract closure two objectives have to be accomplished – close the contracts, and receive/issue verification that the deliverables were received and accepted. The contract closure process has been illustrated in the figure below (Sanghera, 2006, p. 251).
1.1.4 **Why does project closure matter?**

Before we progress with the discussion it will help to understand the importance of project closure phase. Barager (2013) says ‘without a formal closure process, project teams can fail to recognize the end, and then the project can drag on—sometimes at great expense’.

Field and Keller (2007) and Barager (2013) write that a formal project closure ensures that:

- End product matches with the goals of the project.
- Post-project-closure the assignments and happenings remain healthy.
- Customers and stakeholders are satisfied with the end result.
- Critical knowledge is captured.
- The team feels a sense of completion.
- Project resources are released for new projects.

1.2 **Problem**

This thesis explores the project closure phase of project management of IT projects in Swedish public sector. While there is abundant literature on project management but in that literature the discussion of project closure is very limited (Havila & Salmi, 2009; Havila et al., 2013). Consequently there are not many procedures for handling the project closure stage (Havila et. al, 2013).

Cats-Baril and Thompson (1995) discuss that although there are studies conducted on information technology in public sector but those studies deal with the premises of IT projects and do not deal directly with the management of IT projects in the public sector. At the same time there are projects which take too long to close even though those projects would have been better identified and marked as not-to-be-pursued. Straw and Ross (2005) illustrate this with an example of a project which took a decade and millions of dollars in losses before it was closed.

Royer (2005) reasons that there are certain cases where the projects would rather still be continued instead of closing them. Nonetheless it is of paramount importance to know when to close a project before it becomes a drain on the resources (Royer, 2005). Hence it
calls for a research on the aspects of identifying how a project manager can handle project closure.

1.3 Purpose
The purpose of this thesis is to develop a deeper understanding, from a managerial perspective, of project closure phase in the lifecycle of IT project. The research involves identifying the various factors that govern the fate of the project and exploring how the manager can track the progression of project closure. The factors could be related, but not limited, to organization, human values, technology, finance, and resources.

1.4 Research questions
The thesis intends to answer the following questions:

- What can a project manager do to be prepared for project closure?
- What factors affect project closure?
- How does a project manager control progress of project closure?
- What are the key actions that a project manager performs in closing phase?

The first research question addresses the timespan and the project lifecycle before the project closure starts. The second question looks on finding the factors that affect both pre-project closure and project closure phase. The last two research questions concentrate on the project closure phase.

1.5 Delimitations

- This study focuses on IT project closures in Swedish public sector.
- IT projects can be of type development, maintenance, deployment of commercial-off-the-shelf products.
- The research doesn’t focus on the estimation aspects such as financial, schedule, resource of the project management and specifically project closure here.
- IT project managers were interviewed for this study.
- The duration of the IT project can be both short-term and long-term.
- The IT projects do not involve outsourcing.
- The impact of Swedish project management style hasn’t been discussed and analyzed in this study.

1.6 Definitions

Project management – Project management, then, is the application of knowledge, skills and techniques to execute projects effectively and efficiently. It’s a strategic competency for organizations, enabling them to tie project results to business goals — and thus, better compete in their markets (PMI, 2010, chapter 1).

Project manager – Project manager is the leader of the project team (PMI, 2010, chapter 2).
Project life cycle – A project life cycle is the series of phases that a project passes through from its initiation to its closure (PMI, 2010, chapter 2).
2 Theoretical framework

The following subsections deal with project management, stages in project lifecycle, project closure, the comparison between planned and unplanned project closure, the problems encountered during project closure, and the competencies required for closing the project.

2.1 Project management

Project management is an area which is very elusive because projects can be very different in terms of duration, composition and scope. Consequently there are many different approaches to project management as well. Companies in today’s IT businesses work with agile methods in their projects but there also exist lean project management, incremental and phased approaches to project management. What most projects have in common is that they derive from the same traditional process of project management (Nokes, 2007).

Other than the approach and stages that a project goes through there is a huge difference in how projects are executed and how they are managed. Every project has a start and an end which means that project is carried out during a fixed amount of time with a distinctive purpose. At the very essence IT projects do not differ, only in terms of what the outcome is. But organizations do have many types of projects that are undertaken. It could be very different outcomes for all of them – a new development project, a maintenance project which is done every month or an implementation of new software. The various phases in a life cycle of the project are presented in the next section.

2.1.1 Stages in project lifecycle

A project has a lifecycle analogous to the life cycle of a living being – be born, live, and end. There is no one lifecycle model that can be applied to all projects (Field & Keller, 2007). The project lifecycle might vary for projects because in real life the projects tend to differ from each other (Lock, 2003). Nevertheless these models are useful to determine and guide from project’s initiation to the project closure (Field & Keller, 2007).

A typical full project life cycle consists of the following phases – conceptualization, planning & design, implementation, handing over, operation & maintenance and termination of the project (Lock, 2003). PMBOK Guide (PMI, 2010) lists the traditional project development stages as – initiation, planning and design, executing, monitoring and controlling and closing.

![Figure 3 Project development stages (PMI, 2010)](image-url)
Field and Keller (2007) elaborate a basic five phased model having following stages – define, plan, organize, execute, and close. The authors mention that the first phase might be called as feasibility phase since.

Lock (2003) presents the following life cycle for project.

![Typical full life history](image)

**Figure 4 Various stages in project life cycle (Lock, 2003)**

While discussing project lifecycle it helps to briefly take a look at how the requirements for staff and resources progress during a project’s lifecycle. As the illustration in Figure 5 shows, the cost and staffing levels are low at the start of the project, gradually increase as the project goes through implementation and then drop when the project draws to a close (PMI, 2010).

![Staffing and cost levels during project lifecycle](image)

**Figure 5 Staffing and cost levels during project lifecycle (PMI, 2010, p. 16)**
2.2 Project closure

The last phase of the project life cycle – project closure phase is an important stage in the lifespan of a project and requires due diligence (De, 2001). De (2001) and Dvir (2005) stress that that like all the other phases of project life cycle project closure should be properly planned and budgeted. Gardiner (2005) hits the right note with the point that project closure begins during the project planning and not at the end of the project. Gardiner (2005) extends it to mention that closure activities should be carried out throughout the lifecycle of the project to ensure that the project can be closed properly.

The project closure combines two procedures – ‘commissioning of the project deliverables and documentation of all experiences in the project’ (Gardiner, 2005). The project closure is foreseeable but how it is handled and when it is handled have a huge impact on the success of the project (Hormozi et al., 2000). Project closure for an IT project means that the information system has been built and is ready to be handed over to the customer (Cadle & Yeates, 2004).

Cadle and Yeates (2004) further add that at this stage the requisite technical documentation, user manuals, testing, and training should be finished. McManus and Wood-Harper (2003) write that in the context of an IT project this last stage can be considered as part of project delivery and present the process of project closure (illustrated in Figure 6).

![Project closure diagram](image)

**Figure 6 Project closure (McManus & Wood-Harper, 2003)**

Dvir (2005) mentions four different ways in which a project can be closed – extinction, addition, integration, and starvation. Closure by extinction means that the project was successful in accomplishing the goals. A project can be closed by including it in the organization (addition) or by distributing the resources – equipments, personnel, functions – in the
organization (integration). Unsuccessful or obsolete projects can be terminated by cutting the resources or funds (starvation).

De (2001) writes that improper handling of project closure can result in several unfavorable effects such as -

- Time over run
- Cost over-run
- Tarnishing the image and credibility of the project team
- Locking up valuable human and other resources, that could have been gainfully utilized elsewhere
- Stress on the project personnel.

2.2.1 Planned project closure versus unplanned project closure

Planned project closure is a formal step that has been incorporated in the planning done at the outset of the project and is carried out as scheduled to formally set in motion the wind-up of the project (Lock, 2003).

McManus & Wood-Harper (2003) say that project’s boundaries need to be clearly defined for a planned closure of the project. Similar views are expressed by Gardiner (2005) when the author mentions that in real world the boundaries of the project’s end become hazy and a project is closed as per the plan when the project meets its planned and stated objectives.

Not all the projects undergo a smooth journey culminating in a successful end and some of the projects need to be terminated even before they have accomplished the planned goals and objectives (Havila, Medlin, & Salmi, 2013). The authors explain that premature project closure can occur during any phase of the life cycle of the project. The authors further add that there could be internal or external reasons for such premature termination of the project.
Lock (2003) writes that sometimes projects don’t end successfully and lists the following reasons for premature closure of the projects:

- Lack of funds
- Fundamental changes to the project which necessitate scrapping the project
- Changes in economic or political conditions which render the project as unpractical
- Project is put on hold based on the directions from the customer
- Intervention caused by an act of God such as tsunami, earthquake, flood and so on.
- Disruptions due to hostile activities

Cats-Baril and Thompson (1995) mention that 20% of IT projects get terminated prematurely because of:

- Failure to assess the risk of failure when the project is initiated
- Failure to determine how the risk would be counterbalanced
- Failure to recognize that different projects require different managerial approaches
- Failure to implementation risks

2.2.2 Project closure problems

The project closure phase has its own share of problems and this section provides an insight into some of those problems.

Heerkens (2002) says that the problems could be largely categorized under three headings – technical, project team, and customer. The table below provides the list of the problems under each category.

<table>
<thead>
<tr>
<th>Technical</th>
<th>Project Team</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Start-up problems with new products or new designs</td>
<td>• Loss of team functionality as some members complete their tasks</td>
<td>• Agreement on what outstanding commitments still exist</td>
</tr>
<tr>
<td>• Thorough identification and agreement on all remaining deliverables</td>
<td>• Loss of interest in tasks such as documentation</td>
<td>• Absence of a clear hand-off strategy</td>
</tr>
<tr>
<td>• Loss of control of the charges to the project</td>
<td>• Attention is diverted as members transition into new projects or other work</td>
<td>• Change of responsible personnel at critical transition points</td>
</tr>
<tr>
<td>• Difficulties in securing useful project historical data</td>
<td>• Fear of no future work</td>
<td>• Unavailability of key personnel</td>
</tr>
</tbody>
</table>

Table 1 Problems at the project closure (Heerkens, 2002)

Havila, Medlin, & Salmi (2013) list the following as the challenges in the project closure stage:
• Skills and competencies required to close a project differ from the skills required to execute the project
• Projects sometimes undergo re-negotiations of schedule, or have their goals redefined or the resources get shuffled
• For long term projects the project closure tends to attain a strategic perspective

Orr (2004) writes that sometimes the customers of advanced projects are reluctant about closing the project because of the fear that it might be difficult to get the problems resolved.

Spirer (1983) uses tree representation to illustrate the problems of closing the project (cited in Field & Keller, 2007). In the tree like representation (shown in Figure 8) it can be seen that the problems branch out in two key areas – emotional dealing with staff and client, and intellectual having internal and external aspects.

![Figure 8 Project closure problems (Spirer, 1983)]

2.3 Project ending competencies

The project closure stage requires different set of skills & competencies (Havila, Medlin, & Salmi 2013). Since project closure involves interaction with different types of stakeholders
Havila et al. (2013) write that negotiation skills are one of the important skills that a person dealing with project closure should have. The authors add that in some cases the skills to deal with the media may be needed. Another important ability that the authors stress upon is to capture the learning gathered during the course of handling the project and use that knowledge for the future projects.

Orr (2004) stresses that the person handling the project closure is adapt at conducting the performance analysis and performing quality control of the project. Field and Keller (2007) write that financial accounting skills are important for the project manager handing the closing of the project. For projects in public sector emotional maturity, diplomacy, conflict management, negotiation skills and managing stakeholder expectations are helpful (Oracle, 2009).

### 2.4 Project closing activities

Richman (2012) categorizes the project closure activities under the following headings – project, finances, project documentation, personnel and resources. The details of the activities under each category are available in Table 3.

Snedaker (2005) provides the list of the activities that need to be done to close an IT project. The tasks are:

- Maintain a log of issues that are pending or open and which deliverables would be affected because of unresolved issues.
- Change requests might come in at project closure stage and will need a review
- Prepare a report of bugs that would be fixed in the later versions/releases
- Technical documentation pertaining, but not limited, to system configuration, program code, instruction manual, training manual, test results, product certification, help files, FAQ, audio trainings, infrastructure, applications, deployment plan
- Archiving of project data
- Updates to project plan
- Identify any outstanding risks
- Prepare project closure report
- Obtain formal sign-offs
- Plan for support or maintenance needs
- Plan for operational transfer
- Determine training needs
- Plan for a project audit
- Identify code/method/process that could be reused
- List problems, both internal and external, that impacted the project
- Identify legal aspects such as copyrights, patents, regulatory requirements
- Record lessons learnt
- Release project resources
• Manage closure in security such as access control lists, permissions to information systems, configuration to firewalls, user directories

Meredith and Mantel (1989) discuss that following items should be addressed as part of project review activity taken up during project closure (cited in Field & Keller, 2007, p. 361):

• Project performance – comparison of achievement with plan
• Administrative performance – review administrative practices within the organization
• Organizational structure – recommendations for changes to structure
• Team performance – confidential report to senior management on the team members’ effectiveness
• Techniques of project management – review the methods used for estimating, planning and cost control

### 2.5 Factors affecting project closure

Nicholas (2001); Snedaker (2005) and Marchewka (2012) point out that effective communication is a vital factor. Good communication is integral to the success of the closure phase. The other factors that Marchewka (2012) lists are – team personnel, pending bugs, depletion in resources, documentation, slippage in schedule, sense of panic and acceptance from project sponsor. Snedaker (2005) highlights the importance of user involvement.

Thamhain and Wilemon (1975) write that project schedules, project priorities, personality and manpower are the four important factors in the project closure phase. The other factors are technical opinions, procedures and cost. Nicholas (2001) extends the list of the factors to include conflict & stress, administrative and organizational issues, performance trade-offs interpersonal differences and review & audits.

Field and Keller (2007, p.356) provide the following factors – future of project staff, hand-over and maintenance, documentation, contract completion, financial accounting, project review, and handling the loss of interest in the project.

### 2.6 Private versus public project handling

Even though the primary processes remain same the public sector projects face challenges that projects in private sector do not face (Oracle, 2009). Bretschneider (1990) conducted a study to find out the potential differences between public and private sector that affect IT project management in an organization. Bretschneider identified the following differences:

• There exists greater level of interdependence across organizations for public than private organizations.
• Red tape echoes distinctions between public and private organizations.
• The criteria for purchasing decisions for hardware and software are different for private and public organizations.
• Project planning in public organizations involves linkages to agencies outside the boundary of the organization. Whereas the project planning in private organization veers towards internal coordination.

• IT project managers in public sector are at a lower level in the organizational hierarchy as compared to their peers’ position in private sector.

In addition to complex setup because of political processes, the projects in public sector have overlapping set of rules, standards and processes to ensure the adherence to standards (Oracle, 2009). Furthermore the projects in public sector are under keen observation of the press. For IT projects in public sector it is advisable to put in extra efforts during the requirements phase and develop a meticulous set of requirements (Oracle, 2009).
3 Methods
The subsequent sections delve in the methodologies used and touched upon in this thesis.

3.1 Qualitative vs. quantitative
Research methods are often placed under two different categories. Qualitative research or quantitative research.

Firstly quantitative research involves gathering information that is focused on numbers and statistics. Quantitative data are that are measurable and can often be used in graphs or tables. Methods that can be used in quantitative data collection are experiments, questionnaires and observations. McLeod (2008) writes that the result should either be able to fit into categories or be counted.

Qualitative research is compared to quantitative more focused on descriptive data that could be obtained through a number of ways. Data collection techniques used to gather qualitative data is interviews, unstructured observations, diary accounts or case studies. Qualitative data is often more difficult to analyze compared to quantitative data. That is because it is more complex and could involve analyzing in an accurate way different behaviors (McLeod, 2008).

In this thesis we will do a qualitative research as we are focusing on using data collected from interviews and secondary literature connected to our subject. As we will get elaborate answers from our data collection qualitative research is the best option as we intend to analyze our data in depth (Yin, 2010).

3.2 Reliability & validity
Reliability and validity is an important aspect in any research to be able to make a contribution. To have result being reliable the result should be able to be replicated and have almost the identical outcome. Reliability can be measured by doing the same test twice or using different methods to get the same results (Saunders et al., 2009)

Validity refers to the ability to measure what something is supposed to measure. The accuracy of a study or test in a research needs to be valid if the results will be of any significance. If a result can be properly referenced and there is good evidence of the outcome then you have validity in a form. In our study we want to have both reliability and validity to the most extent. By doing the same type of data collection on different subjects we can have a sort of consistency in our work and also try to use both primary and secondary data sources.

3.3 Data collection
There are a number of data collection techniques that one can use when doing a qualitative study. One could also use different methods in the same study. This is called triangulation and this helps to have more validity in the research. Adding more collection techniques
helps to check each result and compare with one another (Saunders, Thornhill & Lewis, 2007).

There are different types of collecting data and these should be considered when doing a research. For qualitative research the common is to use case studies, observations or interviews because this gives a more deep understanding of a specific scenario. Especially applicable to smaller samples. In this research we will mix interviews with secondary literature search within our topic.

### 3.3.1 Primary and secondary data

There are two main data sources that are used in most publications. Primary data which are obtained directly and with more supervision. Primary data, in our case, are the usage of interviews which we know come directly from the source. Other primary data are obtained from observations, surveys, company reports and emails (Saunders et al., 2007).

In our thesis we will also use secondary data in form of publications related to our topic. Secondary data can be apart from research papers other publications such as books, articles and newspapers. One could say that secondary data are collected from sources that already exist rather than sources that have been created by the researcher for example (Saunders et al., 2007).

### 3.3.2 Interviews

Interviews in terms of qualitative research aims to describe and interpret what the interviewee says. The main task is to connect the result of the interview/conversation to an analytic stage to get results that are significant to the subject. Interviews can be done in different ways, preferably face to face but it is possible with telephone and by other means like – skype for example (GOA, 1991)

There are many types of interviews that one can do as a researcher. It is important to think about which one is best for the situation in the research. Saunders et al. (2007) list the different types of interviews:

- Informal interviews - no planned questions, the interviewer and the interviewee have more of a conversation on the predetermined topic.
- Standardized open ended interviews - There are a number of planned questions asked to every interviewee.
- Closed fixed response interview - The interviewees are asked the same questions which are planned but can only answer with an answer provided in a list.
- Semi structured interview - A somewhat planned interview with some predetermined questions and topic but with a lot of room for open discussion.

There are both strengths and weaknesses with doing interviews. The biggest advantage is that one can get deeper insights about the topic when interviewing someone. You can get much more to interpret than just words. Voice, emotions and body expressions are also part of the interpretation that could be used in the analysis later. Another advantage is that
you as a researcher can steer the interview in terms of the type of answers you will receive. The perk of being able to plan a interview with the questions that seem most appropriate. A researcher can also write better more clearer reports with interview data because of the detailed data obtained (GOA, 1991).

There are some disadvantages as well when it comes to interviews. It is mostly connected to the pre phase before actually doing the interview. It can be hard getting a proper time and place to actually have a decent interview. There is also the possibility to miss some information i.e. forgetting to ask some questions or running out of time. Interviews can be time consuming especially in the analyze phase as it is very time consuming to code the data and transcribe it properly (Saunders et al., 2007).

The interviews we have done in this study has been done in the public sector. Our initial approach was to send out as many request as possible to known IT departments. We got answer from Jönköpings kommun and after the first interview with their IT portfolio manager Svein Lister we decided to narrow our scope to the public sector. We then got in contact with another person in Jönköpings kommun that worked closely with our first contact. Lastly we did get in contact with a manager at Domstolsverket. Both of these public sector organizations have a big IT infrastructure and many customers to maintain.

All the interviews was semi-structured interview with some questions we had in mind before, but there was always room for discussion and follow up questions. Two of the interviews were done in English and one interview was done in Swedish. The interviews was recorded and the content shown in the thesis is approved. The interview transcription can be seen in the Appendix.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position held</th>
<th>Interview duration</th>
<th>Organization</th>
<th>Type of IT projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svein Lister</td>
<td>IT portfolio manager</td>
<td>37 min</td>
<td>Jönköpings kommun</td>
<td>IT maintenance, deployment of commercial-off-the-shelf IT products</td>
</tr>
<tr>
<td>Jan Pihl Karlsson</td>
<td>IT project manager</td>
<td>27 min</td>
<td>Jönköpings kommun</td>
<td>IT maintenance, deployment of commercial-off-the-shelf IT products</td>
</tr>
<tr>
<td>Christer Boklund</td>
<td>IT project manager</td>
<td>31 min</td>
<td>Domstolsverket</td>
<td>IT maintenance, new system development, deployment of commercial-off-the-shelf products</td>
</tr>
</tbody>
</table>

Table 2 Details about interview
3.4 Research approach

3.4.1 Deduction

Deduction is what you can call scientific research. It is often called the testing theory, because it involves having a specified theory or hypothesis that explains what is expected from the research. Deduction is commonly expressed by five stages developed by (Robson, 2002):

1. Deducting a hypothesis
2. Expressing the hypothesis in operational terms so you can measure results.
3. Testing the hypothesis
4. Examining the results of the test
5. If needed, modify the theory

There are many ways to do deductive research. It is very important that the researcher is independent of what is being observed to have good reliability and be critical to the research (Saunders et al., 2007).

3.4.2 Induction

Induction compared to deduction is where the researcher builds own theory. For example going through series of interviews and observation on a sample to build a theory on a specific area. The collected data would be the ground to the analysis that you go through as a researcher in an inductive approach. Inductive research is often more appropriate on a smaller sample size because of the observation and concentrated research of individuals or small groups of people is well suited for an inductive approach (Saunders et al., 2007).

In this thesis we will have an inductive approach as we are doing interviews on a smaller sample size of organizations. There are many researchers that use an inductive research because of their usage of different collecting methods and in that sense inductive approach is likely a better choice than deduction is in that scenario (Saunders et al., 2007).

For this thesis we will be using an inductive approach as we intend to form our own theory based on the data collecting we will conduct. As our main data collection technique will be interviews it is best that we have an open mind towards the results and observation from the collecting.

3.5 Research analysis

The analysis technique is an important part as it is the method which you get your results. There are many ways to analyze data. In our thesis we are focusing on to explore and find out something new to contribute with. There are other ways as confirmatory that has as a goal to confirm an already stated theory. To our qualitative research we are doing an exploratory analysis (Saunders et, al. 2007).

We will use data reduction and data display analysis in our thesis. Data reduction is an analysis technique that takes the collected amount of data and reduces the amount to meaningful data that is significantly smaller. The theory is to quickly reduce the data to the most
important categories and concepts of an interview or an observation for example. Apart from reducing the data we want to display is using data display where the reduced data is visualized and organized to be easier to read and understand. This method will make it easier to draw conclusions from the data obtained. The advantage being that we save time when doing our analysis (Yin, 2010).

Important for us is that the analysis will take everything said in the interviews in consideration when doing the data reduction. It is crucial that we do not miss anything, especially when we the time frame is limited we want to get as much good data out as possible under a short period of time.
4 Findings

This section of our study will display and explain our data collected from the methods we have used. The findings is the reduced data together with the thoughts and interpretations from us as researchers.

4.1 Companies

4.1.1 Jönköpings kommun

The municipality of Jönköping is the local political stronghold in the region of Jönköping. Jönköping is one of Sweden’s 289 municipalities and as all the others it has executives and committees leading the region. All municipalities have a number of administrative offices. The responsibilities of Jönköping municipality are many but the concentration is on education, child care, elderly care and also recreational cultural activities. Apart from this the municipality also makes decisions for giving permits and building new buildings for example. Some companies are owned by the municipality for example and are rented by companies in the region. There are many different opinions that want different things in a political organization like the Jönköping municipality (Häggroth, Kronwall, Riberdahl, & Rudeback, 1999).

Our focus in this study is the IT department of Jönköping municipality. The IT department works to support the rest of the instances in the municipality as a main object. Most of their IT is used throughout the child care and elderly care by employees around the region. As Jönköping is the stronghold for the country council as well a lot of IT services are done here in cooperation with other municipalities around Jönköpings län.

4.1.2 Domstolsverket

Domstolsverket or the Swedish court administration is a public sector organization that is like the municipality in the way that they support other instances. Their focus being the Swedish courts all from the highest court to the local courts. The administration is controlled by the government and acts as a service for the people working with upholding the law (Domstolsverket, 2013).

The office in Jönköping where we have been to do our research is the head office for the administration. There are over 200 people working in the office in Jönköping both in IT, economics, support and administration. The IT department especially have a big role in the Swedish courts as they have projects that lay ground for the systems used when setting out sentences for example.

4.2 Findings from interview

4.2.1 Have a lifecycle model

One of the common responses we got from our data collection was that the project managers use almost the similar approach when moving through the project lifecycle. When comparing the different answers we found that they use a pre study and then go through
the different stages in the lifecycle. The slight difference between the two organizations was that they used different terms for the stages.

“Once the pre study is made we either go for it or do not. Then we get to the initiation stage. After that we move into the planning phase where we plan the project, who will be part of the project and what milestones will be included in the project. We then have a decision point where we actually decide if it is liable to go through with this project and hopefully we get a yes and move on into the execution phase. That is where it all starts working towards the goals that have been stated in the previous stages. After this we have another decision point where we look at the results and if every part has been done accordingly. Then we get to a closing phase…”

Jönköpings kommun has used this lifecycle and it is very easy to follow. Domstolsverket uses the same thinking with a pre study but have more focus on construction and transition of systems as they work more with handing over to maintenance.

“After pre-study we have phase called förberedelse (inception) and the next phase is etablering (elaboration). Then we have the third step, the main phase where the main construction is done. And then the last one, the important one, is closing the project. So after the first phase the project should be planned in more detail for execution and for resources and what time would you need to fulfill the project and so on. After the second phase we would have the main architecture, questions sorted out and most of the requirements from customers are in place. Then in the third phase the most relevant phase the programmers do most of the work. And then in the last phase we install it and then leave the project to our customers and try to be part of daily maintenance here.”

To link this to the closing part we can say that the lifecycle has not much to do with how the closing is done. The closing of a project is done either as a transition or handover of some sort in these cases. The difference in names are nothing elaborate it is just slight difference between what happens after the last phase. User could takeover it completely or maintenance gets responsibility or even be used by themselves in house.

4.2.2 Agile for successful project closure

The trend we saw and that was brought up many times in our interviews was the talk of agile methods. All the managers had positive talks about agile and felt it was positive when thinking about the closure of a project.

“…I like agile methods. Always when I have a project I divide the project into pieces of sprints with 4-6 weeks in each. It is usually more simple to deliver in small sprints and often easier to know who is involved. That is how you keep speed in the project and do not waste time…”

It seems that having many closing stages in sprints is preferable than having one big sprint and an ending in the project. The question that came up was if it gives pressure to the people involved in the project that work under the manager.

“…It helps people. If you feel pressure to be able to deliver then it is better to have pressure in small pieces during the project than one big piece of last part. I think AGILE development method helps us.”
This was the common thought in the interviews as well. The pressure should also be communicated in the project team. If a problem comes up in one sprint it is easier to go back and fix it before the next one starts. There will be more structured and thorough work when having small pieces done properly. One act that can help to see problems is to have daily meetings and talk amongst each other to see what everybody in the team has been doing or is going to do in every sprint.

“...have a meeting each morning with the project team and go through the tasks for every individual and also state if there is any problems inside the group that can be handled by all team members…”

4.2.3 Pre-study is important

It was highlighted during the discussions that it pays to do a pre-study before launching the project.

“The project will only start when a proper pre study is made.”

A diligent approach to pre-study phase is necessary to ensure that, as far as possible, the risks are anticipated, the essential requirements are obtained, initial estimations of cost & resources are calculated and clarity is gathered about the requirements. And that there are no surprises that emerge while closing the project.

“The pre study phase seems very important to miss many risks. Yes, the pre study phase is crucial even in small projects we would like to have some sort of pre study even if it is only a day.”

The results of the pre-study are the criteria for evaluating whether to take up the project or not.

“When we deliver a report from the pre study; that is the basis if we start a project or not.”

If the pre-study is then there would be very less chances of unexpected unpleasant surprises in the closure phase.

“One important thing is to spend efforts, more efforts than sometimes we usually do, on the early phase. So try to ensure that we know what to do on overall level, try to ensure that risks are eliminated early.”

4.2.4 Begin with the end in mind

It emerged from the discussions that it is important to keep project closure in mind while starting the project.

“The closure of a project is often the part that is the hardest and the part that you forget when starting up a project.”

It was stressed by all the respondents that project closure needs to be planned in the beginning.

“I think about the project closure when I plan the project from the start, how I am going to close the project because I know it can be difficult.”
All the tasks that need to be done during project closure must be defined, planned and accounted for while preparing the project plan. As far as possible adequate time should be given to closure phase so that the project members are not rushed and none of the activities get missed out.

“... in the beginning of the projects, so we ask ourselves who is interested and why they are interested and also when? Then we use that when to have as a closing stage in each sprint.”

4.2.5 Start preparing for project closure well in advance

All the respondents talked about starting the preparations for project closure in advance.

“We mostly plan for project closure for a couple of weeks or may be sometimes months in advance.”

For short term projects it might be easier to do so since the project is small and closure phase is not too far in the time plan. But for long term projects it is important to plan for closure phase in advance.

“For the smaller projects it is not normally a problem because they are small and their teams are really small. So in that case I usually get in touch with the project manager two weeks before the project should end and ask how you are going to wrap this up. For the larger projects I talk to the project managers approximately two months before the end date.”

4.2.6 Pay attention to documentation

The importance of documentation was brought up during the discussions. Document everything that needs to be documented. Since the project team gets dismantled once the project gets over it becomes necessary to document.

“Write a project closing report... Try to document the system, may be hopefully part of the system before if not in the last phase, make sure that every document that needs to be written is written.”

Project closing report is one of the important document that needs to be prepared in project closure phase.

4.2.7 Learn the lessons well

An important part of project closure is to reflect on what went well in the project and what could be done better. It helps to conduct post mortem of the project and document the lessons. These lessons can be, and should be, used for upcoming projects. It would be extremely disconcerting if similar mistakes are repeated over and over in different projects.

“Try to summarise the project, to learn what has been good and what can be done better next time.”

4.2.8 Communication is the key

The importance of communication was brought up during all the interviews. Clear and good quality communication among all project personnels is important.
Closing IT projects: A Swedish public sector perspective

“…keep all in the project informed one is to keep up the good work, to motivate, people need to know what is happening, how are things going, where we are in the project..”

The project manager needs to ensure that the team members know what is happening in the project. Communication can help to resolve the conflicts that emerge during the closure phase. At the beginning of the project, preparing a communication plan can help to reach the right people.

“… make a communication plan for it on how to inform these people, then the important documentation of what plans you may have should be written down in the project documentation. Just to see when a deadline comes you can also see which people to talk to.”

4.2.9 Check the checklist

Two of the managers stressed upon the importance of having a well-maintained checklist and consulting it while closing the project.

“…should go through a checklist of the requirements to see that everything has been going as it should.”

It helps to have regular meetings with project team members to exchange information, to address the problems and their resolutions, to discuss the status of the activities and share upcoming changes in the situation of the project.

“Yes sort of, something that I feel is important as well is to have a meeting each morning with the project team and go through the tasks for every individual and also state if there is any problems inside the group that can be handled by all team members instead of keeping the problem for you. This you can do to check everyone and it builds a team.”

It emerged from the discussion that checklists help to ensure that the tasks are not missed out while rushing to make it to the scheduled time and help to keep track of the personnel who should be involved with the activities. If the project has to be delivered to maintenance team then the details of the maintenance team contact person, and how it would be carried out needs to be identified at the start.

“if you don’t plan the handover from the start then there is no one to receive result. So that’s always the problem. ..You need to have decided at the start who receives this and how shall this be done.”

4.2.10 Project maturity and IT governance

One of the managers, who oversees all the IT projects in the organisation, brought up project maturity and IT governance. This was in response to the question of why projects don’t close and instead overrun.

“I think it has to do with project maturity in an organization… So they know they have their lifecycle and know where they are inside a project. Something is going to come out know and then they know that they need to prepare for it. Jönköping Municipality is not mature at all there be-
cause we have not been running projects properly and projects have just been going that’s what they expect it to be. ...I think it will get better over time and strict governance, of course!”

It emerged that if an organization has higher levels of project maturity then the projects can be planned well, executed and closed.

4.2.11 Engage the maintenance team & customer early in project life cycle

The importance of liaising with the maintenance team early in the project life cycle was highlighted by the managers. There are situations when the maintenance team is not ready to accept the deliverables and the situation becomes problematic.

‘Through experience there is a problem when the maintenance says no to the deliverable. That’s why we want to have the maintenance in the early stages so they can see and be part of the building process and therefore have an understanding if something is missing’

Similarly the significance of engaging with the customer was stressed upon to ensure that the outcomes match with the planned requirements.

‘We feel that what we deliver in the end becomes better when customer has been involved as much as possible.’
5 Analysis

This section summarizes the findings section in our thoughts. The data from the interviews along with the framework, stated earlier in the thesis, are the platform for what has been presented below. We have applied the findings on the theoretical framework to see if the theories correspond to the reality. We also intend to answer the research questions we have been investigating the whole research period.

5.1 Research questions revisited

The research questions have under the time of writing been changed and elaborated on a few times. The final outcome and answers for them are displayed here and they are based upon what we have categorized from our data.

• What can a project manager do to be prepared for project closure?

From the interview discussions we found that when preparing for project closure in IT it is essential that you do start preparing early in the lifecycle for the closure (Boklund, see Appendix V). The project closure and planning for this phase has been explicitly discussed in PMBOK Guide (PMI, 2010). Often there is a shortage of resources if the project is not closed properly because the resources needs to be relocated and lack time (Lister, see Appendix III; Karlsson-Pihl, see Appendix IV). Having procedures that is known by everyone in the project team is a good way because the communication in the team early on can make it easier in the closing phase. It is especially important for the project manager. This limits the bad surprises and gives the team members a clear picture on what is needed and also who is responsible for the transition when the project is finished. Organizations could use a protocol in the earlier stages where this is clarified and also be returning to this every meeting.

• What factors affect project closure?

The discussion highlighted that the factors that affect project closure are often connected to the communication and planning (Karlsson-Pihl, see Appendix IV). The communication between the different parts of the project like steering committee, managers, developers and analysts. The better the planning is done, the better the outcome is in most cases. It is a matter of being well prepared for what will be done in the stages. Conflicts within the project team, interaction with the maintenance team, motivation, and bringing the problems to surface emerged as key factors during the discussions. These factors resonate with the factors which have been discussed in section 2.5 - Factors affecting project closure. Also it was highlighted that project maturity and IT governance effect the closing phase (Lister, see Appendix III).

• How does a project manager control progress of project closure?

The project managers mentioned that having control in a project is very important for
the manager and here as well we get back to communication and preparation. The control of the project closure can be easier to handle if there is a clear method to follow. The checklists can help to ensure that the closing of the project follows through as planned (Boklund, see Appendix V; Karlsson-Pihl, see Appendix IV). Archibald (2003) echoes similar thoughts and stresses upon the benefits of checklists during project closure.

The project managers mentioned that there is no supreme method for handling project closure; the important aspect is that there is some sort of stencil to follow that everyone agrees on (Lister, see Appendix III; Karlsson-Pihl, see Appendix IV). As a project manager you save time by having a mature model in the organization. We also found that the trend of being AGILE is preferable when monitoring projects, as it divides the projects in sprints and therefore more visible deadlines (Boklund, see Appendix V). This makes it easier to keep a good speed in the project and also get good quality as you review each sprint before starting the next one. The closure of a IT project needs to have a mature model where it is stated that the closure should be addressed (Lister, see Appendix III).

- **What are the key actions that a project manager perform in the closing phase?**

It was highlighted that when the project comes to the closure stage there are activities that often get missed or ignored. The main reason for this is that the planning is insufficient and consequently the closure stage could be missed or forgotten and underestimated (Lister, see Appendix III; Karlsson-Pihl, see Appendix IV; Boklund see Appendix V). The activities that happen in the closure stage should be to review and go through what has happened during the IT project. What has been done? What was good and bad? In some cases there are meetings or even kick outs, where the project group is dissolved and returned to another project or their normal duties. A checklist or protocol to determine what have been done during the project could be used as a watermark for evaluating the outcome of the project long or short. Similar set of activities have been identified by Snedaker (2005) and Archibald (2003). The checklists can be used during the project as well in the different sprints that occur in AGILE methods for example.
5.2 **Project closure model**

The model described above is graphical illustration of our understanding from the data that we have collected. The model describes the lifecycle that mostly was the talking point but also the project closure stage explained more explicitly. The project goes through certain stages while transitioning from the start to handing it over to the maintenance. The model has a pre-study that has been conducted at the very first stage. The pre-study is followed by a decision point where it is decided to go on with the project or not. The remaining stages are similar to the models described in the theoretical framework. The approach to the project lifecycle takes a simplified view. The important thing is what work is done inside each stage.

The closure stage has been expanded to show the details of this phase. The study and the focus is about the closure in IT projects so we wanted to explain the activities inside the closure stage that are important for having a good transition to the maintenance. The planning of the project closure needs to address the resources that would be required during the closing phase. And then the project manager would have to keep a track of the progress of this closing phase. The activities related to the documentation, project review and releasing the resources can be done in the order suitable for the project. Hence these three activities have been grouped together in the above diagram (see Figure 9). Once all the activities are done and the end result is as per the agreed requirements, then the project can...
be handed over to the maintenance team. Maintenance has been mentioned as a clearly defined step because during the discussions all the project managers said that the projects are handed over to maintenance.

5.2.1 Plan for project closure at the beginning

This stage is actually not inside the closure stage but much more earlier in the lifecycle. The closing of a project needs to be addressed in the beginning, preferably in the planning stage where you plan for resources, budget and people involved. This is because there needs to some sort of clarity what happens after the project is done. Everyone connected to the IT project can then either move on to another project knowing that it will be handled properly. The ones that get the responsibility to control the project in the end can free up time in advance.

5.2.2 Determine resources needed for project closure

As mentioned above the people and resources involved with the project needs to have proper management and clarity. An important stage is to plan for what is needed in the closure part to make an transition, handover or a close of a system for example. To determine the resources that is needed in the last stage you should look at the people and resources that have been most invested in the project to help determine which ones that should have time when it comes to closing.

5.2.3 Control the execution of project closure

The next stage connected to the closing part is to control the execution, to do this it is a good idea to have a meeting or inform the people involved some time before. The reason for this is to be prepared again with the planning. To have a good control it is also a good idea to keep the project separated into pieces where it is easier to keep track of what is happening. The closing phase will get more controlled and there will be less questions coming up from both maintenance and user if having straight answers.

5.2.4 Release resources

When the project comes to an end and the responsibility has been given to someone that hands it over to maintenance or makes the transition the group should be dissolved to get back to normal duties or to start another project. When releasing resources and people you can as a manager give feedback to the people involved. This helps in other projects for both manager and team member. Some organizations have a kick-out when there are big projects to mark the ending of a project.

5.2.5 Documentation

As mentioned before the people that will be responsible for the project in the closure part still have some work to do. As the team gets smaller the documentation needs to get started and sorted out. It is important to have the requirements, positives and negatives of the project to send with the user or maintenance. They can get a better picture on what has
been done during the project as well as what can be done if something happens. Document-
tation is to learn and to have something more to hand over when the project has ended.

5.2.6 **Conduct project review**

Project reviews are intended to find answers to questions such as whether the project was completed in time and within budget, what benefits can be reaped for future projects, was the result of good quality, are there any further improvements that can be done, how was the performance of the team, did the tools used during the project help. Project closure report is one such document which is aimed at getting all the answers documented in one place.

5.2.7 **Hand it over to maintenance**

Last stage when it comes to project closure. Here the resources connected to the closure also dissolves. The system or product should be done and accepted by the maintenance or user in this case. The project has hopefully fulfilled the requirements and delivered a good solution.

Theses stages within project closure have importance because they are often ignored and forgotten. To minimize the risk to have a project over budget or not closing properly these stages will help to always have the closing phase in mind even in the start.
6 Discussion

This section discusses the main findings of this study in relation to proposed research questions. The implications of this study and suggestions for further research are also discussed in this section.

6.1 Results discussion

The purpose of this study was to investigate the practical aspects of IT project closure handling in Swedish public sector organizations. The semi-structured interviews with IT project managers helped to delve deeper into the practicalities of project closure.

What can a project manager do to be prepared for project closure? We observed that comprehensive planning is the key to being well prepared for handling project closure and for any surprises that come up during the closing phase. The project manager needs to determine the factors that could affect the project closure. Although the lessons from earlier projects can be drawn to execute project closure, it is worthwhile to mention that same practices might not be applicable for each project closure.

How does a project manager control progress of project closure? It emerged from the discussions that regular meetings with the project team & project stakeholders and checklists are good aids for project manager to keep track of the closing phase. During the project closure the project manager needs to ensure that reviews are conducted & documented.

Although the findings lean towards managerial perspective, but the answers do help to address practical aspects of project closure. Though it is possible that not all the findings can be generalised for IT project closures across all the public sectors.

6.2 Methods discussion

This study takes a descriptive approach to the problem as indicated by the research questions. The responses from the interviews, leveraged by the theoretical understanding, have been used to gain a deeper understanding of IT project closure from a managerial perspective. This study is a qualitative one as we conducted semi-structured interviews to collect data.

The primary method of data collection for our investigation was limited to interviewing method. Consequently the findings have been drawn from the inputs provided by the project managers. The usage of only one method for collecting the data can be seen as a limitation. Using the observation method or case study could have been another approach to get a detailed insight in the closing of IT project. But we didn't observe in reality how IT project closure is carried out. There might be a different set of data which could be available from those first-hand observations.

Another aspect of the investigation is that the research concentrates on the viewpoints of IT project managers. It is probable that the project members and project stakeholders might have different viewpoints on IT project closure.
The decision to do semi-structured interviews with IT project managers was consisously done since the timeframe didn’t allow us to approach the investigation by combining different methods and broadening our perspectives.

6.3  Implications for research

This study contributes to project management literature as it tries to bind slightly odd couple – IT project management and public-sector. Instead of focusing on the premises of project closure, this study provides a view on how project closure is actually handled and executed by IT project managers. Additionally the study revealed that project maturity and IT governance need to be considered for their role in IT project closure.

6.4  Implications for practice

The findings of this research orientate towards managerial aspects of IT project closure in Swedish public sector organizations. Furthermore the findings concentrate on the practical aspects of IT project closure. The study shows that project closure merits meticulous planning from the very start of the project. In addition to planning the closure phase, the project manager needs to implement certain mechanisms to check the progress of project closure and ascertain that the project closes successfully. The study brings out an interesting point that project maturity and IT governance have a reciprocative bearing on the project closure phase. It is not enough to hand-over the project to maintenance once the project closes, it is important to involve the maintenance team during the project closure phase.

6.5  Further research

This study shows how planned IT project closures are managed. Furthermore, the research concentrated on two Swedish public sector organizations. There are a few limitations that can be addressed in future studies. The future studies can investigate handling of project closures in other public sector organizations. The other public sector organizations might have a different perspective on handling IT project closures because of the environment those organizations operate in.

Additionally this study has focussed on planned IT project closures. The research scope can be broadened to study unplanned IT project closures in different countries. The study of IT project closure handling in outsourced projects can be tackled in future studies. This research concentrated on project manager’s perspective. For future research the respondents can include the project team members, the stakeholders, the maintenance team.

As another suggestion for future work, a comparative analysis of IT project closures in public sector and private sector organizations, can be conducted. The comparative study can be done in organizations in different countries and how an organization’s culture affects project closure.
7 Conclusion

This thesis focuses on project closure - an important phase in IT project’s lifecycle. Moreover it explores planned IT project closure in Swedish public sector. During the investigation conducted in this research there are many good points that are explained further. The IT projects closure phase do have a problem when planning and preparing for project closure.

In this study the semi-structured interviews were the primary data source and provided ground for our understanding and results in the analysis section. The public sector organizations, that we have investigated, work with commercial off the shelf projects. Once the IT project gets over it is handed over maintenance. The IT project managers, interviewed from Jönköpings kommun and Domstolsverket, have provided the inputs and have helped to made this study useful.

We found that project closure is not a difficult phase to handle if properly handled in the early stages. Planning and preparation to the closure stage are as important as executing the project. Apart from planning there needs to be a closing procedure that everyone knows and is familiar with. Mature models inside an organization help elevate the doubts of the employees and also provide guidance on how to address upcoming problems.
List of references


List of references


Appendix

**Appendix 1 Interview Questions**

What stages of project management do you follow?

Is project closure/termination formally taken up?

When do you start preparing for project closure?

How do you determine that it is time to start the project closure task?

With which activities do you start with the project closure?

What are the challenges you face during project closure?
## Appendix II Project closure checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Responsibility</th>
<th>Due Date</th>
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<td>Scheduled</td>
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<tr>
<td><strong>Project</strong></td>
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<td>Have all activities in the project plan been completed?</td>
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<td>Have all work orders been completed?</td>
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<td>Have all contracts been completed?</td>
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<td>Have all outstanding commitments been resolved?</td>
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<td>Has the client or customer accepted the final product(s)?</td>
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<td>Are all deliverables completed?</td>
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<td>Has agreement reached with the client on the disposition of any remaining deliverables?</td>
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<td>Have external certifications and authorizations been signed and approved?</td>
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<td>Have all audits been completed and issues resolved?</td>
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<td>Have ongoing maintenance procedures been activated?</td>
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<td><strong>Finances</strong></td>
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<td>Have all payments been made to vendors and contractors?</td>
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<td>Have all costs been charged to the project?</td>
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<td>Have project accounts been closed?</td>
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<td>Have remaining project funds been returned?</td>
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<td><strong>Project documentation</strong></td>
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<tr>
<td>Have project plans and supporting documentation been revised to reflect the “as-built” condition?</td>
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<td>Have final project reports been prepared and distributed?</td>
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<tr>
<td>Has the project plan been archived with supporting data?</td>
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<tr>
<td>Have “lessons learned” been documented, shared with appropriate people, and archived with the project plans?</td>
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### Appendix

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<tr>
<th>Personnel</th>
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<tbody>
<tr>
<td>Are all parties aware of the pending closeout?</td>
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<td>Has effort been recognized and rewarded?</td>
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<td>Have project personnel been reassigned?</td>
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<th>Resources</th>
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<tr>
<td>Has excess project material been dealt with?</td>
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<td>Have project facilities, equipment, and other resources been reallocated?</td>
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Table 3 Project closure checklist (Richman, 2012, p.184)
Appendix III Interview with Svein Lister

And then we have projects, but basically each project needs to handover the result of their project. Sometimes there is also a fourth group here, which is the actual administration that has requested the project. So there is some sort of handover there. Often, the administration then has the software or the systems maintenance, because we don’t have it centralized. So every project needs to handover to these three. So, what we have done is we have come up with a number of checklists that should be gone through for each project when they come to closure stage. However the problem is that for projects that have already been up and running it is very difficult to come up with a checklist that is good and suitable for the projects. So basically what you need and that comes back to first question when do you start the closure stage - well that you do at the planning stage. Because you need to know at the planning stage when you decide what you are going to do. The project manager needs to go and talk to the sales and support, go to system maintenance and they need to go to ICT and say this I what we are going to do. What do you need from us? And then together with the managers from these three areas agree on a checklist and at the end you go through the checklist - we have done this, we have done this, we haven’t done this but that’s because ....reasons.... And then the managers from these three respective areas start off with the project once that is done there is also a total sign-off with the project owner. So we have four different sign-offs basically for every project. And once that sign-off has been done then it’s ok. Then they come to me and then I agree to close the project.

Question - How do you handle the human resource part - the people involved in development building the software do they remain in the pool they go back to the pool

Yes, they go back to the pool. And we do very little software development. We basically buy all our software that we need. Sometimes when something needs to be developed we buy the development. And we buy that as a package from the company. In that case we really don’t manage the project. So, if you want to know about systems development, then I will have to go back to an earlier life. Because that is where I spent most of my time. This is very different. This is very hardware related. And very commercial-off the shelf software.

Question - Can you tell us about, before your Jönköping kommun profile, when you have worked in system development projects? So in that case how do you see the project closure?

Ok, [normally we have] if you develop a system then you set up a time and it depends really on whether you work really in agile development model then you basically set the time from start. So for you it makes much easier, you have the resources and you say I going to have my resources till this date. And then we basically produce as much we can state. And then we produce the functionality. We keep prioritizing what should be developed and in the end we have a product. And that product is when we have run out of money or run out of time. And then normally, as you say, at least at the places where I have worked once the resources have finished they go back to the resource pool. And if for some reason you need to continue the project you need to shout out at least a couple of months before hand because otherwise those resources will be pulled up to do other things. But everywhere where I have done software development there is also always a proper
maintenance organization to handover to. So the projects end before we hand over to maintenance. There is no sort of end of system’s cycle. Not that kind of closure - closure is when we handover to maintenance.

Question - What kind of problems have you come across when you tried to close the project? It could be from any perspective - from organizational, people?

Two big problems - one is if you haven't done your planning properly [so this is what I am really experiencing now] someone decides you need a system/a solution and decides that ok, we should create a solution but if you don't plan the handover from the start then there is no one to receive result. So that's always the problem. So, whoever ordered the project, project owner doesn't want to close the project, because he doesn't have someone to take over the result. That I think is the main problem. You need to have decided at the start who receives this and how shall this be done. So that's the main problem. And the other problem is that's organizational. As for the other problem with project closure is that in the large project the whole bye thing is a big transition and I find that lot of the time especially when you have, not the IT people because they are used to going in and out of projects, but if you have the experts that come in and you manage to get them full time in the project I have seen so many times that their managers are not very interested in IT. So you have these people back into their organisations and they basically lose, they have lost a year. So no one is interested in to know what they have done, how well they have been doing it, or whatever. And so they feel that when it comes time for them to discuss their raise their boss doesn't know what they have been doing. So they don't get rewarded for the hard work they have put in. So next time when another project comes along they don't want to be a part of it. And that's something I have seen in a few places. At the start of the project they are put in to the projects because they are the experts, they know all about this. And everyone is like wow, yes, we want you to do this and I come back and say where you have been.

Executives, managers not having a proper knowledge of IT - we came across some articles where they say that when managers or executives have a role where they are overlooking a project and they don't have proper knowledge about IT, to handle IT people, what they do and how long time will they take. May be underestimate or overestimate the time that they will take. Interesting point.

Question - Do you think that towards the ending of the project, the closing stage, the motivation of the people tends to wane off or it becomes very low? Does the quality of the work get affected?

Only in the aspect that it is difficult to get them do little things. Especially as a portfolio manager, you want them to finish some forms. Ok we have got these forms to fill in and they are not very interested in doing that because they feel that they have done their work, they have delivered. But as far as motivation to get the work done, to get the actual delivery done, no I don't think so, no don't see it. Because everyone wants to finish off in a good way especially if you build a good team. They all want to deliver. But it can be hard because in software development project you have few people involved at the start and then you build up the team. So you have a lot of people involved for a while. And towards the end you go down to a small group again. And it can be sometimes be difficult to keep the motivation of small group because they miss the big
team. It is a lot more interesting to be in the middle of it. And normally the people who are involved in the start are also the people who are involved in the end. The reason that they are good to have at the start; you have the project managers, the architects, software architects – they normally really like the first stages of the project, where they carve the ideas. So in actually closing everything, in transitioning that's not exciting. But I don't think they lose interest. I think the project manager has to stay focussed and make sure that they deliver. As long as the project manager is focussed I don't think there is the problem.

Question - Documentation aspect when you have to ask people to finish - do you think something else which is missed for e.g. sharing knowledge?

Eh, yes. Well, depends on how you mean sharing knowledge. I think something that is often missed is the educational part. Then I would be thinking user education, knowledge transfer to the maintenance team. But I don't think that it is because of the lack of the interest. It is because it gets missed out in the planning. And that means because you rush everything towards the end, because you have to keep the end date. And used to be that you missed out on the testing because you have got very little testing. If you have got Agile development then it is not a problem because you test all along. But the actual handover to maintenance that's what suffers exactly. So you just say, “There are you are. Bye bye”. As long as you plan it is fine. But it comes with experience. If you have a good project model that says you should do this, then I think it is not a problem. If you know you are going to do it, it is fine. It is only when it comes as a surprise that oh, we forgot to do this.

Question - In your opinion do you think there should be a formal project closure?

Well, some sort of formalised project closure - yes. But I think formal project closure can be too, for example for us I need to get in touch with the project owner or the manager to close the project. That’s formalised. It doesn’t have to be bigger than that. If it is a large project then there should be a proper kick-out. Of course, it is something to be happy about.

Question - And suppose as per the planning the project has to close by for example end of May. When would you, as a project manager, start working towards the project closure? Even though the project could be in testing phase.

For myself, I think about the project closure when I plan the project from the start, how I am going to close the project because I know it can be difficult. But what I do as a portfolio manager now, for the smaller projects it is not normally a problem because they are small and their teams are really small. So in that case I usually get in touch with the project manager two weeks before the project should end and ask how you are going to wrap this up. For the larger projects I talk to the project managers approximately two months before the end date. So say, “How are you planning to do the project closure”. And sometimes they say “Ok, we were planning about this” and I say, “Very good. Perfect.”. But normally they say, "Ohhh". So that’s when I want them to start thinking about it. Because one month later they should know otherwise it is going to be too late. But I think at least a month’s head start. At least a month before the project should close you should know exactly what you are going to do. And for really big projects it is having too late. But
we don't have many projects that are really that big. Because it is very important. If you are two months ahead of the end date, it is still enough time to be able to say, "Ok, we can see that because of all the closure activities we are not going to make the end date for example. So you have to extend for a few people".

Sometimes the project manager has responsibility of some people inside the project to make sure they are being properly handled into their line of work. We do not have that so it is not that much of a problem. You need to know as a project manager at what point you hand these people over to their line manager.

Do you have problems with external people having access to buildings and data during the project time?

Yes normally it is a problem at the start of the project and not at the end of a project. At the end of their contract we just have an agreement on a day when they hand over their ID tags. Access to our systems is another thing but as it is not accessible from the outside anyway. They need to be in the building to access the system. We have things that could be better in security; they still have their logins after the project is done.

When you started at Jönköping kommun what was the biggest obstacles you have come across when managing these projects?

The biggest obstacle has always been to get the systems maintenance people and the business to accept the result and take responsibility of the result. So the project owner can say that they are happy with the result and take responsibility for it as well.

The project managers involved need to be at another place so it needs to be a plan for handing over the project. Let's say we have a project that should have been ended in January it drags on until March before we actually close it because they have not been thinking about this before it is crunch time although we keep reminding them. We tell them that you need someone to take over, then they show up with someone; We say great and then this person do not have the time.

Aha, so they have some other task to do.

Yes exactly, they have not planned that this person needs to have time free to actually do this.

Is it some kind of reasons for a project going on and on for a long time? What could be the reasons for project overrun?

I think it has to do with project maturity in an organization, I think the Swedish board of agriculture they are very project mature for example Husqvarna where I also worked, they were also very mature when it
came to product project maturity, not IT but products. So they know they have their lifecycle and know where they are inside a project. Something is going to come out know and then they know that they need to prepare for it. Jönköping Municipality is not mature at all because we have not been running projects properly and projects have just been going that’s what they expect it to be. So even when we say; Are you ready for this?, Yes we are ready! The people are then ready to use the software but not take care of the maintenance.

I think just keep trying at it and remind them about past projects. I think it will get better over time and strict governance! Of course!

That’s the hard part, we have 9 administrations and a lot of politicians and when something is agreed on in one administration you have another one that do not agree at all.

So one administration can’t tell another what to do. It is management by consensus, you do not always get that, in fact you rarely get that. So we need to convince them that these changes need to be made. It is always difficult though to free someone’s time because everyone is very busy. That’s where someone needs to say that you should do this instead.

Is IT a support system for them? There is no IT governance that can cut along all of the 9 administrations?

No there is in some cases, it is said that the IT model should cut across. The problem is that it says so on paper but you know; governance on paper only takes you so far, you need to convince them saying it going to be easier for you and cheaper for you this way.

I think these are very strong points with governance and maturity.

We have neither now really. We have our project model on paper but no one really looked at it and used it. It is a new project model and not everyone knows about it. We have some experiences project managers but many projects. The models is there but now we need for people to actually understand the models and they probably need to mature as I put in these just a couple of months ago. I am sure there is room for improvement as I get more experienced as well knowing how to do this in Jönköping and in the region. We want to have the same model for the whole region and all the other municipalities, Landstinget as well. That makes it more difficult and interesting.

That’s basically means we have to keep it very nonspecific. The main difference that we have between the old model and the new model is that the pre study is taken out of the project. That means when we make a decision to start a pre study it means nothing and when we deliver a report from the pre study that is the basis if we start a project or not. It usually was before that if you had a pre study you always had a project, but then you had no idea what it was going to cost. Now the pre study should say how long it is going to take and what it will cost. Then the project itself only has three stages which is the planning stage, the execution stage and the closing phase. The reason for that is that we have so many projects and I don’t want that. The model do not stop if someone wants to do agile methods.
Appendix

These are the questions we had in mind.

Do you think the answers make sense, have you spoken with other people as well?

You are the first person we have spoken to about this topic.

We are still investigating where to go in this project and trying to narrow ourselves down a bit. It is very good thing.

If you have any follow up questions just call or send me an email.

Do you have anything else to add for us?

Well, I think there is no such thing as a holy grail when it comes to project management; there are so many companies that are trying to push their holy grail. Now a lot of people talk about agile project management it is rather similar to iterative project management. Some people will say that agile management is not project management, some will say that it is, whatever. I think that different types of projects require different approaches. There is no replacing experience as a project manager because you learn to engage in situations which you cannot read in a group and such different models that there is as PMI, Prince 2 they are not the same but that it is something to follow. It does not really matter though which one you pick, that’s one thing because I have used many different kinds and everyone says that; this one is the best. It is the same thing but you call it another name, so that’s interesting. Of course they help because you have something that you follow. The other thing I can do if you want to look into project management is to say that you should take a look at your neighbours here at the board of agriculture because they have a huge project now that involves 80 people.
Appendix IV Interview with Janne Karlsson Pihl

We thought we would start by asking you what role you have in Jönköping municipality and what you do connected with project work?

First off I wanted to say that I think you have chosen a very good topic for investigation. The closure of a project is often the part that is hardest and the part that you forget when starting up a project. I have been working as a project manager since 1994 back and forth but it is projects I want to work with. I am new here at the Municipality, I worked at the Board of Agriculture before with project management as well so it is fitting for me. Me and Svein are old colleagues, we have been working side by side.

What is your role right now?

Right now I am working with projects to establish a good contact network in the municipalities around Jönköping, like a call center but much more. So that people can get help quicker with their problems. I also support Svein in his duties. Controller for the projects here at the Municipality.

What stages are often included in your project lifecycle?

Well, we begin with something called an initiation. Before that we usually have a pre study and the pre study becomes like projects itself. Once the pre study is made we either go for it or do not. Then we get to the initiation stage. After that we move into the planning phase where we plan the project, who will be part of the project and what milestones will be included in the project. We then have a decision point where we actually decide if it is liable to go through with this project and hopefully we get a yes and move on into the execution phase. That is where it all starts working towards the goals that have been stated in the previous stages. After this we have another decision point where we look at the results and if every part has been done accordingly. Then we get to a closing phase where you return personnel and hardware you may have used. The last thing we do is another decision point where it is declared that the project has ended. Very roughly that is the process.

So the pre study phase is often outside the project?

Yes so whenever you do a pre study it follows the same procedure. Of course there will be a budget and a resource to do this as well but the project will only start when a proper pre study is made.

But if we think of the closing stage for a bit, what are your thoughts? What are the challenges that occur?

I cannot speak for the Municipality because I am quite new. But from experience I can say that during the execution phase you have a huge workload at most times and there are complications. The requirements can change or there are new people involved. When the project then is close to the closing phase you fall into that phase unprepared and realize that you have to talk to maintenance and the resources should get back. It sometimes comes as a surprise when it gets to the closing phase.

What are your opinions how to handle these challenges in the best possible way?
I think you should handle this at the early stages of a project where you do an analysis on which people that will be affected by the project and also be responsible for it. Then you make a communication plan for it on how to inform these people, then the important documentation of what plans you may have should be written down in the project documentation. Just to see when a deadline comes you can also see which people to talk to.

What is or do you have some sort of trigger when closing a project, some sort of document or checklist that is used in the last stage?

The trigger for a project closing is often that it is delivered. The documentation says that the person that will take over should be informed but I does not say how they should be informed. I could send an email but that is not often enough. The ideal is to talk to someone and explain what the system does. These people should be included already in the execution phase. That is what you often miss out on.

What is your opinion on what is a long term project vs short term projects in terms of length?

It is hard because there is a floating border on what is long and short when it comes to projects. Shorter projects is often easier to close because the closing phase is very close compared to long term projects that is a long time away, then it is harder to think about the closure early.

There is often many people involved in long term projects, how do you handle the people that will take responsibility after the project is done? How to assure that they have time to handle the transition after project ending?

That was a hard question because a project should be aiming to complete its goals and if it not reaches its goals the project gets continued. The other choice is that terminate the project with the rest and start a new project with the resources, or just to end the project as a failure. If you want to continue you have a problem that many of the personnel connected to the project disappears to do other scheduled work. If it is a risk that the project will continue overdue it is a good idea to as soon as possible in beforehand say this to the people involved, not a week in advance but much earlier. This is a problem often in a long project.

The pre study phase seems very important to miss many risks.

Yes the pre study phase is crucial even in small projects we would like to have some sort of pre study even if it is only a day.

What activities come up during and before the project closure?

Often you have a meeting, with the maintenance, project leader and the other concerned. In this meeting we go through what has been done in the project, the purchaser or the one that order the system often should go through a checklist of the requirements to see that everything has been going as it should. Through experience there is a problem when the maintenance says no to the deliverable. That’s why we want to have the maintenance in the early stages so they can see and be part of the building process and therefore have an understanding if something is missing.
What would you like to add about projects in general? Something special you would like?

Yes I like agile methods. Always when I have a project I divide the project into pieces of sprints with 4-6 weeks in each. It is usually more simple to deliver in small sprints and often easier to know who is involved. That is how you keep speed in the project and do not waste time. So small agile parts, then the methods do not matter so much if it is RUB, Scrum or whatever it is important to have small sprints inside a project.

So you would like to have small deadlines inside the project at all times?

Yes sort of, something that I feel is important as well is to have a meeting each morning with the project team and go through the tasks for every individual and also state if there is any problems inside the group that can be handled by all team members instead of keeping the problem for you. This you can do to check everyone and it builds a team.

There could be guys that do not share and this becomes a problem for everyone later on.

What questions come up when it is close to the closing stage?

Often it is the question; is the maintenance ready for the project? There could be some issues with the security that come up also but mostly is it that the product is ready for transition.

Have you got the answers you wanted?

Yes you raised some very good points thank you.

Communication is the most important thing.

I wanted to show you what we have in the beginning of the projects, so we ask ourselves who is interested and why they are interested and also when? Then we use the when to have as a closing stage in each sprint.

Ok thank you very much!
Appendix

Appendix V Interview with Christer Boklund

We are doing research on project closure, the last stage of the project lifecycle. The questions we want to address 'what questions to do you ask yourself when you close the projects and what factors and triggers that come in mind when you close a project. Those are the research questions which we want to investigate in this thesis. To start off we would like to hear from you what is your role in Domstolsverket, what you do currently and what have you been doing these couple of years.

During last six years at Domstolsverket I have been manager for development team here of around 30 employees and between 10 to 40 consultants. So totally about 70 people. That’s quite a big group to manage. So for that reason, and other reasons, we have changed the organisation. So from 1st March we divided it into a couple of smaller groups. Instead of two big groups there are five smaller groups including 10-15 employees. From 1st March there are people as managers for these small groups. I am at a position supporting IT managers for the whole IT department. That’s my role.

IT projects which you have - they are of development nature (like completely new development) or they are maintenance or you have off-the-shelf products that you deploy them here. What kind of IT projects do you have?

It's a mix. So within Finance and HR we have off-the-shelf products that we buy and install in our environment. Of course there is some kind of work with them as well. But as I understand it is different kind of work. So that’s one kind of project. Installing upgrade on standard products. Then most of our projects are about developing existing systems. We have about 10 major systems where we work quite often. The other 30~40~50 minor systems need some work as well. Most of our projects are about adding functions, fixing errors and problems, support new versions such as new Windows version etc. So that’s another type of project. And the last one is developing new systems. It is not very often but yes, it happens now and then. So, these are three different kinds of projects.

What is the normal duration of the project? Are they very long term or short term or you have mix of those projects?

It is a mix as well. The short term projects are for about a couple of months [2 to 3 months]. And the large projects here run over a year or two. Honestly when it becomes two years it becomes too long a duration for projects. It should be divided into smaller parts but for different reasons that is the case. So, that’s for the shortest and the longest duration. Say, most of the projects are between six and twelve months.

The projects which are of duration 6 months to 12 months - would you categorise them as a long term project or as a short term project?

In my words, that would be a standard project here. Short term projects for me are for couple of months and long term is when they have a timeline over a year. Six to twelve months is a standard project for me.
Do you have a project lifecycle model that you use for your projects? What are the stages a typical project goes through?

Most of the projects here start with some kind of pre-study to get more information about what needs to be done and why and trying to find out whether it is worth the effort to do it. And get some kind of estimation about it and the risks. And then when it is done a decision is done about moving on to the main project or sometimes may not do it because it is not worth the effort.

What are the stages after pre-study?

After pre-study we have phase called förberedelse (inception) and the next phase is etablering (elaboration). Then we have the third step, the main phase where the main construction is done. And then the last one, the important one, is closing the project. So after the first phase the project should be planned in more detail for execution and for resources and what time would you need to fulfill the project and so on. After the second phase we would have the main architecture, questions sorted out and most of the requirements from customer are in place. Then in the third phase the most relevant phase the programmers do most of the work. And then in the last phase we install it and then leave the project to our customers and try to be part of daily maintenance here.

In your experience, in project closing phase, what do you feel are the main problems that come up in this stage?

It is hard for me to point on one thing because it is different from one project to another. I think one main thing is to keep the time level. If we have a date promised to finish this or install it and for us and many others it is hard to keep the date because there are things all the time. And it becomes new wishes, new requirements from our customers to want to be done this as well and this and this and this. It’s so hard sometimes to be able to say "stop now, that’s not possible". Or to discuss this if we do this then we need to remove this. And exactly how much different things take time. So keeping the time level is one important thing to keep an eye on. But I think another thing important is to do work that’s left to be done after the installation, documentation and trying to get this project as part of daily maintenance organization here. Another thing is to write a project closing report. We would want to try to summarise the project, to learn what has been good and what can be done better next time. And when this is done the project is nearly finished, people moving on to new things and it is hard sometimes to get time and effort to spend last days, these last hours for project summary report. But basically it is important to learn from what we have done. So that’s few things. I think for us that’s working with system is very critical for our customers. It is even hard to plan for a good installation. If we talk about an upgrade to an existing system we get a time slot when we can close the system. We must do this and this and this and then it must be up and running in couple of hours or in a day or over the weekend or may be later. And to prepare that procedure to assure that it is possible for Monday morning or for what’s decided and up and ready for customers again. That’s one tricky part.
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Do you usually include customers in that process - often have meetings or discussions daily?

*Yes, as much as possible. Because we feel that what we deliver in the end becomes better when customer has been involved as much as possible.*

Can you tell us, in your opinion, what factors affect project closure stage?

*The main factor is that trying to insure that the project goals that we listed in the starting, they are fulfilled as long as the project is kept in budget. The main thing is that project goals are fulfilled.*

When do you start doing the project closure in the project cycle? For example you have planned for project closure to start from next week - so would you start only from next week or one/two/three week(s) before?

*I think we mostly plan for project closure for a couple of weeks or may be sometimes months in advance. Because let’s see if it is quite a big project - which is huge work as well and important for both the product we deliver and for the people involved. And try to do summary - what's been done and what can be better done next time. It needs to be planned.*

How do you determine that now the project can be planned for closing now - the first thing could be that the work is done? But if you get into more details then what questions would you ask yourself and your team to determine that now the project closure should start?

*As once again I think it is very much related to the installation in the product that has been developed because as long as we keep customer closely involved in the project (what we are trying to develop and install) when all their requirements, and other requirements as well, the hardware - when all that work is done and we have planned for installation. It is obvious that the next phase is when we start closing the project.*

Suppose you get more requirements towards the end, as you told in the beginning that the customer might try to push in some new requirements, it might move the project closure phase ahead. So, how do you keep a check that no, at this stage we cannot take in any more or it has to be completely move ahead. Does it depend on the priority of the requirement or on the criticality of the requirement?

*As long as the request for requirements from customers can be kept within the budget regarding the finance and the time most of this is handled within the project. Our project leader is sitting in the group meeting and here often called CCB (Change Control Board) discussing that this is possible to include in the project without risk(s), can be moved in if something else is moved out. As long as this discussion ends with an agreement to move on then of course it can happen that customer comes up with new things that are too big. If it*
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is so important that it must be included we have to change the budget of the time and the installation. And in that case the question is moved up to the steering group of the project. And communicate to them to say this project needs to be changed and in that case we request the steering group. They can say, "Yes, that sounds sensible to do those changes". And they can say, "No, we have other things that need to be done before we do new things or take up new requirements". So, as long as things can be handled within the project or within the time and budget limits most of the things are handled within the project apart from when it is the case with the steering group.

Has it happened that you had to start closing the project before the planned start date?

Not very often, but it has happened. Even if mostly optimistic then it can happen before we had planned. But normally that seems to be the case that the customer would take the possibility to add a few more things. So it is not very often, no.

I guess the pre-study phase and then the decision to go on with the project is sort of discerning if project can be taken up to continue till the end. If the pre-study phase says ok then.Would you say give your project management tips or something that you would say is the best way to do project or this is how we normally do? Talking about the methods - may be you have AGILE method? What is your opinion?

I don’t think there is an easy answer because it is a big question and there is no...most of the things can be...there are different opinions on how different projects can be handled. I think that one important thing is to spend efforts, more efforts than sometimes we usually do on the early phases. So try to ensure that we know what to do on overall level, try to ensure that risks are eliminated early. For example questions related to the main architecture need to be sorted out quite early. You should keep the project under control as always is the case. Sometimes some things that are easy to forget are - one is to keep all in the project informed one is to keep up the good work, to motivate, people need to know what is happening, how are things going, where we are in the project. Important focus is on information. And then as long as possible to even if the project manager is the main person responsible for the project to move the responsibilities as far as possible to people that are doing the main work. That’s another important thing to try to have in the project.

Do you see any kind of conflicts which come up in the team when the project work goes towards the end?

I think different people can have different views on things. In my words, the most important thing is to try to explain why we are doing it this way or that way. It is not always possible to decide that everyone agrees upon but to try to explain why we do this way when some people want to do it the other way. And that’s an important thing. And one thing that sometimes comes up is if a project is good enough to be able to install for the production - some people want to be 100.000 % perfect and that is normally not possible. Some people want to install a little bit early when it doesn’t work in the way it needs to be done. So that is one kind of say conflict, say discussion that come up - if it is good enough to be able to install.
Is there any testing which is done towards the project end? Or all the testing is done before the project closure officially starts?

The aim is to finish all the testing before we install it in the production from a system test view and use acceptance test as well. And if, as long as possible, even performance testing, the last test to determine how system performs on specific hardware. It is always not easy but possible to do it as well. And then during the last years we have tried to move in AGILE development method. We try to get in testing as much as possible. We feel that’s good for the project.

Do you think AGILE mode for project development puts a lot of pressure on people - development and testing in one sprint and move on to the next sprint? Or it helps to manage the work in better way?

I think mostly it is the second alternative you said. It helps people. If you feel pressure to be able to deliver then it is better to have pressure in small pieces during the project than one big piece of last part. I think AGILE development method helps us.

What activities do you start off when you start with the project closure?

We talked about some of them. And of course everything related to installation is quite much in focus. But to ensure that it is possible to install, it is good enough to install, we have a time slot that we can use for an existing system that we have to upgrade, to be able to ensure that we have backups if something goes wrong. We have time and at point-of-no-return we must decide that we can or not finish with the installation. It has happened once, in last six years. Mostly it works as planned. And, of course, planning for all the people involved in the installation process. A lot of people in the inspection team that even come from project development team that tests the system, and from the customer - finally user acceptance testing that is done when the system is installed but not open to ordinary customers. So everything related to that is one big part of project closure. And then as I said before trying to find out what has worked well, what can be done better, try to document the system may be hopefully part of the system before if not in the last phase, make sure that every document that needs to be written is written. And then release the resources. If it is consultants, quite often when you start a project you don’t know exactly when the project needs to be closed exactly. Regarding consultants we may be don’t know exactly when the consultants start and when they should finish their work. Of course when it is coming towards the end we sometimes have to increase or decrease the date when they leave. And then regarding our employees; telling their managers that they are now available for other things to do.

Do you think that the project management style or the procedures and processes differ from non-government organisation to government organisation?

Mainly no. Most of the questions are same regardless of the type of organization; as far as I can see.
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