Saimaa University of Applied Sciences
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Information Technology, Double Degree

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PROJECT STEERING IN GLOBAL ENTERPRISE

Bachelor's Thesis 2011

ABSTRACT
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The goal of this bachelor's thesis was to describe the process of my practical training in the Tieto Corporation. I was assigned there as a project manager of one smaller project. Project's objective was to deliver an automated server-patching process.

The project was already ongoing when I entered and it had delays caused by changes inside the company. At the beginning I had to clarify the situation and produce some project management documents, for example the task list. After that I started to steer the project with assistance from the project owner. During the process, I was using the official Tieto project steering guide, otherwise everything was accomplished by the method “learning by doing”. The thesis was completed by describing the practical training together with the theory behind project management and patching service.

The practical training gave me project management knowledge as well as experience from real working life in a big global corporation.

Keywords: Project Management, Tieto PPS, Automated Patching of Linux Servers

CONTENT

1 INTRODUCTION

The target of this bachelor's thesis is to describe my task within the practical training in Tieto Corporation, together with providing the information, which is relevant to this practical training. I was working as a project manager on a project, where the objective was to deliver service responsible for automated patching of Linux servers. Therefore, this thesis does not include only my personal experiences, but also information about the project management within the Tieto corporation, and technical solutions behind the project.
The thesis is divided into five chapters, and each chapter has a certain number of sub-chapters. The second chapter serves as the general basis for this work. It covers the background for the practical training, characterizes the process of writing the thesis - i.e. processing and compiling materials (both theoretical and practical) with my knowledge and experiences. Also, it deals with depiction of Tieto Corporation and its Practical Project Steering (PPS), the unified concept which is used for managing projects throughout the company. Due to its volume,the PPS concept is not described entirely here. I only chose parts, which I deem significant for my practical training as well as for this thesis. There are also parts of the PPS mentioned in applicable places in the following chapters.
The next chapter explains the technical solution of the service, which is going to be delivered. This involves a description of the software (Novell ZENworks Linux Management) which provides the desired functionality with subsequent implementation of the service using that software.
Management of the Project is the title of the fourth chapter which describes the execution of the project from the project management point of view. This chapter is basically an indirect summary of my practical training because it depicts tasks which I had to accomplish in order to gain work progress on the project. The chapter contains a specification of the project goal, the project personnel, as well as a description of my tasks, including setting up a time frame, daily follow-up, and so forth. Important in this part of the thesis are sub-chapters about the risk list, task list and the project plan. These documents are

vital component of the PPS concept.
The last chapter is the conclusion, where the practical training is summarized. I tried to specify what I have learned during the practical training, how I would perform it again if I would have the chance, and what was and was not good.

2 BACKGROUND

This bachelor's thesis serves as the final product of my studies at Saimaa University of Applied Sciences. I came to study there based on the agreement between VSB - Technical University of Ostrava, where I studied previously, and Saimaa UAS. It was a special Double Degree agreement programme (one year, two semesters) where, after successful completion guarantees grant of Finnish bachelor's diploma, with the assumption that tje applicant already holds a bachelor's diploma from the Czech Republic.
Part (one semester) of this programme was practical training in the Tieto Corporation, which is the actual foundation for writing this thesis. At the beginning of the placement semester, we had a meeting with representatives from the Tieto Corporation and decided about projects we will work on, as well as about our positions within these projects. Due to my interest in management, I was given a position of project manager for one smaller project.

2.1 The thesis realization

My role was clear right from the beginning of the placement, therefore there was no need for narrowing or adjusting the scope. My task was to prepare some project documents (e.g. project plan or service description), which had not existed before, even though the project was already going on at the time I entered it, and to steer the project for the time of my practical training. Due to rather big structural changes which went on in the company shortly before the start of my practical training, the project was in chaos. Also despite the fact that it had been assigned some personnel, nobody was really working on it. This was, from a learning point of view, a valuable experience, because not

everything went as expected - just like in normal working life. My goal was clear: steer the project at least a little and write my experience about it in a thesis. Albeit, there was a company supervisor appointed for helping me. However, he was not really helpful, thus the actions within the project and thesis were carried out in a way which I assumed to be the best way of doing it.
By reviewing my actions, I see that I was more or less proceeding with the theory of “learning by doing” and partially “learning by making mistakes and correcting them”.
By nature, project management is solely practical work. There are books dealing with project management, where the well proven practices are documented, and there are company directives which must be fulfilled. However the major part of a project manager's work is to deal with people, plan and follow these plans, and forecast problems and eliminate them. Apart from the official Tieto PPS manual and one book describing common project management actions, I was not using any theoretical materials. I was just trying to work in a way that I felt was right. I also used the same concept for writing this thesis, therefore it contains almost entirely my own experiences and knowledge learned during my practical training.

2.2 Tieto

Tieto Corporation is an IT service company active in almost thirty countries with around 17 000 employees. The company is also one of the biggest IT service providers in Europe. It provides service in various industries, for example automotive, banking, healthcare, and manufacturing.
I was mostly working at the branch in Imatra (the project was executed there), but also in Lappeenranta, where access to the corporate network allowed me to work through the internet. These two offices are mostly dealing with the customers from forest and papermaking industry (thanks to their location). The company, which ordered this project is also a big company working in the forest industry field.

2.3 Tieto PPS

The PPS (Practical Project Steering) is a working method for actively planning and managing projects, developed by Tieto Corporation. This method is based on practical experience with project management and is well proven to work within Tieto Corporation. The purpose of PPS is to check benefits and quality from the initiation as well as during a project. During the project execution, PPS is preventative and corrective, and its ultimate goal is to produce results and more effective work. To make a project steering clear enough, one of the basic PPS ideas is to work with clear and agreed upon objectives during the lifetime of the project. Adding of new objectives is therefore done only if necessary. PPS is taking care of relationships, both inside (by satisfying and securing project staff) and outside (by satisfying and securing customers) the company. Its central concept includes personal commitment, openness and trust within the project team.

Every project is comprised of three models: business model, management model and production model.
The business model is embodied by an orderer and a project owner, and is expressing the first idea, answering “why“ was the project created.
On the other hand, the management model is giving us the answers about the questions “who?“, “what?“ and “when?“. The management model is in the scope of project management staff.
The production model, embodied by project members, involves creating of the final product itself, and thus telling us “how“ is it being done.

Each project has a number of characteristics:

- it is a unique, one-off event, without having previous history
- it has a starting point and a deliverable objective (a result) at the end
- it has its own budget, an orderer and it is being run as a separate organization

Even though there might be two projects which have very similar or even the same target as well as the same project resources (funding, personnel, and so on), these two projects are not the same from the project management point of view. All the factors could be taken into account only once at a given time, and this is what makes these two projects different, even though they seem the same at the first sight.

As an example, let's use a project where the goal would be to create a computer programme. At the first time, everything would go as expected and the project would be finished within the given timetable and for the agreed amount of money - both customer and our company would be satisfied. The next time, we would have completely identical resources and the output computer programme would be just slightly different, but after one week of work, a lead technical specialist would be hit by a car, making him unable to work for 3 months. This would result in additional costs, delays and other possible problems resulting from the accident. So, the projects might seem very similar when looking at the tasks, but from the project management point of view they are very different.

Even if every project is being run through the predefined Tieto PPS template, there should not be used approach of “not re-inventing the wheel” which says that processes leading to successful completion of tasks should be documented in order to be used for similar tasks later without the need of “inventing” them again. This approach can be used for smaller tasks, possibly within a project, which are likely to be conducted again in the future. This approach on the other hand can not be used for managing of projects in general, because, as shown earlier, no two projects are the same. (Practical Project Steering 2007; Project manager interview 2011).

2.3.1 Basics of Tieto PPS

The PPS methodology is based on a few basic views, which are also its foundations. These views are: a positive view of humankind and its potential, a culture of commitment, a benefit and a mutual understanding.

Every person within a project team is understood as a unique resource, which can be further developed. Each person is able to and will take responsibility, or make a commitment, by working on the project.
Commitments are, from the PPS point of view, always two-sided. Therefore the two involved parties agree in advance, what is to be achieved and what preconditions must exist for this to happen. At the project initiation, the customer's needs must be determined in order to set project's direction. Later, during the project execution, commitment is maintained by continuous feedback. There are three key terms related to the commitment culture: responsibility, authority and delegation. By responsibility we understand a personal guarantee for an agreed result, which will be done on time and at cost. Using authority gives project manager the right to organize and manage agreed resources as well as make a decision within the agreed framework. Workload delegation is another necessary aspect to help a project manager to avoid various difficulties. The project manager will provide this by checking partial results while guaranteeing only the final result, relinquishing control over agreed project resources to project staff and being ready to support the project team members.
A prerequisite for a successful project is also mutual understanding, not only between a customer and a supplier (Tieto Corporation), but also between a project manager and his co-workers - the project staff.

The project manager will, according to PPS methodology, use skills, which are included in three basic processes: agreement, management and feedback.
All three processes support one another. The agreement process starts with identifying the project's needs and benefits. After this phase, the project manager will be ready to formulate objectives and plan the execution, which will together with gaining support and negotiating lead to the reaching of an agreement.
The management process offers supportive tools for project completion, for example, risk analysis, decision-making or support and motivation.
A project-actions review is taken care of in the feedback process. This process

is comprised of project plan comparing, action proposing, status identifying, and so on.
It is essential, that the project manager and project staff are familiar with these basic processes, in order to obtain the optimal effect from PPS. (Practical Project Steering 2007; Project manager interview 2011).

2.3.2 Decision points

In order to unify and simplify a process of managing projects, the PPS methodology indicates eight types of decisions or checkpoints, which are help to keep the project management transparent and easy to navigate. By providing us with an agreed upon and controllable sequence for the project, we are able to review both past actions and future outlooks. In PPS terminology, these checkpoints are called Decision Points (DP).
Decision Points are designed to be generic, so they can be used regardless of the size of the project or the characteristics of the result. Decision Points can also be adapted to various project types and requirements.

The lifetime of the project is divided into eight phases, where each phase corresponds with one Decision Point (or DP, thus DP1 - DP8).
At the first Decision Point (DP1), decisions are based on the project directive and commitment is agreed upon up to DP2, and in some cases up to DP3. During DP1, preparations start, budget is set as well as responsibilities within the project team.
At DP2, the decision whether to continue or to interrupt the project (or repeat the preparations) is made. Project members agree about DP3 (DP2 in case of repeating the process), based on the preliminary project plan, a detailed schedule and budget plan for preparation work, and a risk analysis. There is still time to make some changes during DP2.
Preparations are completed within DP3. The project plan, requirement description and solution description are finalized for the rest of the project. Based on these documents, a decision is made about whether there is a

sufficiently good basis for making a commitment for the remainder of the project.
In some projects, there can be so called DP4p (several of them), during which part of execution already starts (ahead of DP3). Work is based on approved parts of preliminary versions of the project plan, and requirement and solution descriptions (the same documents as in DP3).
Execution of the project is starts upon the decision at DP4. This is probably the crucial part of project steering. Working method, budget, timetable as well as the degree of risk are being agreed on for entire commitment at this decision point. DP5, DP6 and DP7 are considered based on the three approved documents mentioned above, together with cost and income analysis from the orderer or project owner.
During DP5, monitoring, project and risk analysis, verification of both partial and final results and possible changes in conditions are being taken into account as a basis for the decision about whether to continue, change or interrupt the project execution.
At DP6, approval of delivery of the project's result or partial result is made. Transfer of responsibility for the project results to maintainers is decided during DP7.
The project is concluded and the final report is produced at the end of project's lifetime (DP8). (Practical Project Steering 2007; Project manager interview 2011).

3 AUTOMATED PATCHING ON LINUX SERVERS

The architecture of the automated patching service as well as the software used are described in this chapter.

3.1 The concept of automated patching

The Automated Linux patching system is needed in order to lower handwork in Linux patching. Tieto has evaluated a few different software applications suitable for the task.

Patching is required on almost all computer systems in order to maintain system operations and correct possible faults and defects in applications. It may also provide security fixes or new functions to the system.
The patching service delivery was the goal of the project, is based on ITSM (IT service management) approach, which views IT service as a customer centred product. This is not only an IT solution, but also contributes to the customer's business. Thus understanding the customer's need for this product was the reason, why this project was realized. (Project owner interview 2011).

3.2 Technical solution

The architecture of the service, being delivered is based on the Linux Management solution created by Novell. Tieto Corporation (as supplier) buys this software, adds needed infrastructure, and delivers it as a service.

3.2.1 Architecture description

The patching service will use Novell ZENworks Linux Management software (described in the next chapter), which allows the system administrator to perform a various number of tasks. Crucial for this project is functionality of mass patch distribution.
The system architecture would basically copy the architecture used for regular deployment of Novell ZENworks (as shown in Illustration 1 on page 14); the heart of the service would be the so called "mother server" (equivalent to Primary Server in Novell terminology), where the full version of Novell ZENworks is installed. The mother server is directly connected to a "satellite server" (or Secondary Server), which shares almost the same functionality (Novell ZENworks is installed also there, but is missing some components, which are only installed on the mother server) as the mother server. So far, the concept includes just one satellite server, because not more satellite servers are needed at this phase, but it is possible to add a theoretically unlimited number of additional secondary servers. The reasons for addition might be, for example

an increase of the number of the customer's servers which require patching , or adding new customers into the service since the service seems to be easily and cheaply scalable. The satellite server is then connected with end-servers (the servers, which will be receiving patching). Novell ZENworks automatically installs necessary system components to each end-server.
Patching would be applied for both virtual and physical servers, and it would implement operating system patches as well as software patches. According to the Linux specialist, patches will be applied circa three times a week. (Project owner interview 2011; Linux specialist interview 2011; Novell).

3.2.2 Novell ZENworks

The core of the automated patching service is in the software, doing the patching and the secure actions necessary for performing this action. In this project, Novell ZENworks 7.3 Linux Management, was used and provides comprehensive management of Linux servers and workstations. This software offers a wide range of functionality. However, essential for the project are the following functions:

- Management of device software packages, including dependency resolution, SUSE patch support, and previous version rollback
- Management of device configuration and application settings through the use of policies
- Remote management of devices through a secure and fast interface
- Hardware and software inventory, generating of inventory reports

Novell ZENworks Linux Management offers the following management capabilities:

Software Package Management

Novell ZENworks Linux Management uses bundles, which are collections of one or more software packages. It lets the system administrator install, remove,

and roll back software on Linux devices. After assigning a bundle to a device, it is automatically installed on the device.
It also offers an option of whether or not to install a software package. This is done through so called “catalogs”. A catalog is basically a group of bundles that appears in the ZENworks Linux Management Software Updater client on the device; the user then must initiate installation of any of the bundles in the catalog.

Automated Install and Imaging

ZENworks Linux Management includes a service called Preboot Services that enables users to perform tasks on devices before their operating systems boot up. Several tasks can be done on the device (either manually or automatically) using Preboot Services during the booting up, for example:

- Scripted installations run
- ZENworks imaging scripts run
- Making an image of the device’s hard drives and other storage devices
- Restoring an image to the device
- Applying an existing image to multiple devices
- Updating the device’s BIOS

Remote Management

Remote access to devices through a graphical web interface is provided by ZENworks Control Center.

Inventory Collection

ZENworks Linux Management can gather extensive software and hardware inventory for all managed devices, with a chance to create and export custom inventory reports.

The architecture of ZENworks system consists of the following two main components; ZENworks Servers and managed devices (either servers or workstations managed by ZENworks). ZENworks Server is the backbone of the ZENworks system. The first installed server is referred to as a primary server (ZENworks Primary Server) and it contains all components essential for the system run:

- ZENworks services - numerous services, running on the primary server are using software providing package management, policy enforcement, inventory collection and so on.
- ZENworks Object Store - an information repository for all ZENworks objects, defined within the system (e.g. devices, groups, bundles)
- Package repository - contains RPM packages (Linux files, which have .rpm file format), that are available for delivery to managed devices within the system
- ZENworks Data Store - holds the informations about ready-to-be-delivered packages, hardware and software inventory lists and scheduled actions, which will take place within the system.
  Data Store can resides either on the primary server or on a remote server, and all ZENworks servers (Primary and Secondary) require access to the Data Store.

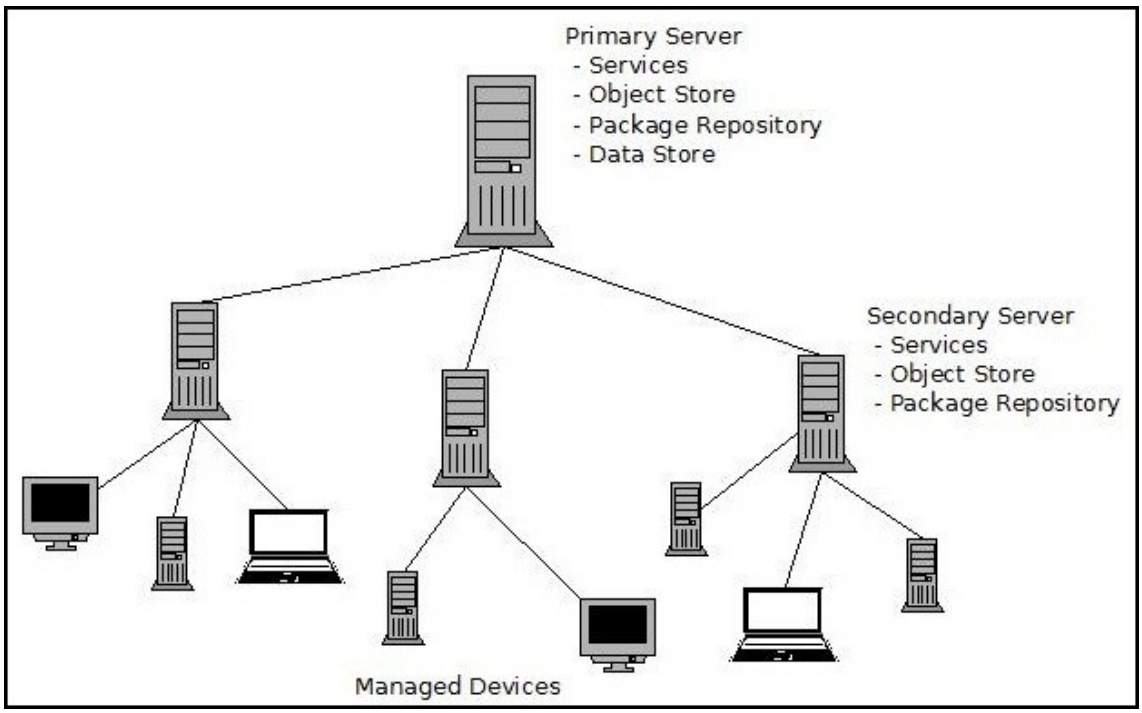

Illustration 1: An example of Novell ZENworks architecture

Depending on the number and location of the devices, additional ZENworks servers, called ZENworks Secondary Servers, might be needed (see an example of architecture in Illustration 1 above). Secondary stores are, in fact, mirrors of the Primary Server and they contain the same components with the exception of the Data Store (services, Object Store, Package repository). ZENworks services and Object Store are added to a Secondary Servers during the installation and configuration, while packages are being automatically replicated there from the Primary Server.

There is the ZENworks agent installed on each end device (managed device), which is communicating with Primary or Secondary server, and which actually enables delivery of software packages, configuration policies enforcement, inventory (both hardware and software) and remote administration to a device. (Linux specialist interview 2011; Novell).

4 MANAGEMENT OF THE PROJECT

4.1 The goal of the project

There was a need of one important customer to have a service, that would be responsible for automatic patching of servers, and therefore the goal of this project was to deliver such a service.
Servers included in mass patching are necessary for the running customer's crucial business tasks, and without them, production would stop or would be significantly diminished. For example:

- Production line
- Resource monitoring
- SCM (Supply Chain Management) systems
- CRM (Customer Relationship Management) systems

The servers simply need to be patched for various reasons, but there was space for improvement of that process, and the patching service was designed in order to fill that space.
The following areas were taken into account:

- Saving costs
- Saving resources (mainly meaning human resources)
- Automating and making the process easier
- Eliminating different risks, which might emerge when the process is difficult to maintain and is not transparent enough

Although the impulse for creating this service came from one particular customer, it is not difficult to sell this service also to other companies reagrdless of size and type of business. The service is general enough so possible future deployment in different environments would need only minor changes from the original concept and setup.
Costs for creating the service are already included in the price, which is going to be paid by the original customer, so any other sales of the service would thus

generate almost full profit. The patching service is suitable for being added to Tieto's product portfolio in the future. (Project owner interview 2011).

4.2 The task list

Steps, or sub-tasks, which must be done in order to accomplish a project are stated in the document called "task list". For the sake of easier project progress, as well as easier and more detailed orientation in the project execution, it is always better to divide a project into a higher number of detailed steps. Each of such detailed steps is usually rather easy to complete, and it does not take much time.

I divided the task list into three logical categories, corresponding to the three basic steps of the project (Appendix 1).

First part sets up steps for preliminary and testing phase. Informations known from the beginning included knowledge for what kind of servers will this patching process be applied, and software, which will be used for the application. Testing phase steps were not very different from the steps used in the implementation.

Second part is dealing with ordering of products (both software and hardware) which was needed for the service realization. It is important to mention, that I did not know the process of ordering in Tieto, and so I made up steps I believed were correct and safe to execute.

Implementation itself starts with installation and setting up of the mother (Primary) server, followed by the same action for the satellite (Secondary) server. After the network configuration, ZENworks software was installed. Last steps of the project are full-functionality check and handover of the service to the customer. (Project manager interview 2011; Linux specialist interview 2011; A guide to the Project Management Body of Knowledge 2004; Practical Project Steering 2007; Berkun 2005; Kerzner 2009).

4.3 The project plan

The project plan, together with the project directive are two fundamental control documents in all project work.

The project directive provides the basis and pre-conditions for starting the project, and it evaluates time and cost frameworks for the preparation work. The benefits for the customer's business are listed, together with customer's requirements for objectives inside the project. The project directive is created by a project owner, and in the case of the project discussed in this thesis it was composed prior to my practical training. I had not seen the project directive and it was one of the reasons why I was lacking important informations about the project for the entire duration of my practical training.

The purpose of developing (which is responsibility of the project manager) the project plan is, before the start of execution phase, to go through, document and agree on all important questions that define the commitments of the project. The project plan has nine chapters which document project pre-conditions and results. Both supplier and customer can then feel more secure when these items are clearly agreed on in advance. It is a major result of the preparation work and acts as some kind of agreement between the project management and the project owner covering the execution of the project.
After the project plan is approved, it replaces the project directive as the steering document.
The project plan contains following chapters:

- Basic information
- Project idea and objective
- Delivery and transferral
- Organisation
- Schedule and resource needs
- Working methods
- Risks

- Project cost estimate
- References

All these chapters must be in every project plan, even though the content of some of them might be missing for various reasons.
There was no project plan when I enterer the project. I do not know how this was possible that the project was already running without any project plan (and also without some other documents), therefore I was assigned to prepare the plan. However, I was not able to finalize the document, because:

- I was missing significant amount of information, which I was not able to obtain
- There was no cooperation with the steering group, if there was one
- There was insufficient communication with the project owner, or the original project owner

Therefore I filled-in only parts which needed content from the project management point of view without any additional knowledge (for example Basic information, Project idea and objective or Risks). Parts which were left blank include Delivery and transferral, Schedule and resource needs or Project cost estimate. (Project owner interview 2011; Project manager interview 2011; Practical Project Steering 2007; Berkun 2005; Kerzner 2009; A guide to the Project Management Body of Knowledge 2004).

4.4 The risk list

One of the necessary tasks, after I got acquainted with the project, was to assess possible risks which might emerge during the project execution. The risks were subsequently evaluated from various points of view. All risks were identified at the initial phase of my work in the company. In Tieto Corporation, risks are listed and described in the document called “risk list”.
Risk list is a document, where all risks, assessed as possible to occur, are mentioned and described using various characteristics. There are a number of variables used for risk description:

- General parameters like: risk occurrence probability, impact or most

impacted project area

- Potential consequences
- Mitigation strategy, mitigation activities
- Risk checking, person(s) responsible

Table 1 (below) shows a shortened risk list of this project:

Description of a risk	**Probability**	**Impact**	**Most impacted area**	**Potential consequences**	**Mitigation activities**
Project delivery delays	100%	Moderate	Schedule	Unknown	Stick to the task list schedule
Purchasing difficulties	20%	Serious	Schedule	Delays, possible changes in technical specifications	None
Server set-up	20%	Critical	Quality	Patching service would not run correctly	N/A

Table 1: The risk list (shortened)

Every risk has at least one cause. When a cause happens, there is a chance that it will result in an after-effect, or a risk. It is a very hard part of every project manager's work to estimate risks, especially from the beginning of the project execution, but having a carefully assessed risk list is a very significant advantage for the future. By knowing the risks, the project manager is able to steer the project “against” the risks, and therefore avoid them.
When evaluating risks, it is important to understand the difference between a cause and a risk. It was not easy for me to distinguish that difference from the commencement, and I assumed that every threat which is somehow jeopardizing successful completion of a project is a risk, and should be assessed and handled accordingly. But the risk is basically just the final consequence, the result of what will happen in case that something (a cause) evolves. The rest of the threats are causes, which might lead to risks. As an example, I would present a project that was delivered with an exceeded budget

because of additional staffing costs, which were not expected during the planning phase but later became necessary. The risk here would be exceeding the budget, and a cause would be the hiring of new people. Another cause, with the same consequence (budget exceeding) could for instance be an increase in subcontractor prices.
Ideally, when a project is well planned (including the risk list), then it proceeds in an agreed upon and expected way (e.g. according to a schedule and on a budget), and risks are not likely to occur. There are problems coming up frequently during a project performance, and it is one of the crucial project manager's responsibilities to solve it, with help and support from the project's steering group so it does not result in a risk. (Project owner interview 2011; Project manager interview 2011; Practical Project Steering 2007; Berkun 2005; Kerzner 2009; A guide to the Project Management Body of Knowledge 2004).

4.4.1 Project delivery delays

This result-related risk seemed to be the most serious one from all, stated in the risk list. The project had delays already during the first realization stage resulting in lowering the cooperation index by the customer. The idea of solving, or at least not worsening, the situation was to proceed with all upcoming steps as fast as possible.
The impact of the risk on the project realization was not however very high. There was no need for calling up additional resources, neither human nor financial. Personnel involved in the project was at the same time working on other tasks, thus deployment of them on this project was not considered a serious problem.

4.4.2 Purchasing difficulties

For realization of this project, it was necessary to make some purchases (mainly software). With this risk, I wanted to suggest that there might be some obstacles in this process caused by organizational changes which might slow

down the implementation phase of the project which depends on the purchases (see the risk-probability estimation from the beginning of my practical training in the risk list on page 18). This subject would not be of concern in other circumstances, but as already mentioned, this project was unique in a way, that many things were abnormal.
This risk came true and the project halted at this stage. Since I had no decision rights, this risk went completely beyond me, and I was not able to do anything about it.

4.4.3 Server set-up

By adding this risk to the risk list, I wanted to be sure that no hazard was being left out. The likelihood of this risk was not assessed as very high, but in the case of coming true, the only consequence would be a short delay of perhaps one to two weeks. I assume, that the occurrence of this risk would cause almost no damage (or no damage at all) because the project was practically categorized as a second-class project,thus its priority was not high.
The main reason why this risk was considered as not very likely was that during the initial stage of this project, simulation of the patching process in the testing environment was run, and so the general configuration was known before implementation and only minor changes were expected in the final-system setting-up.

4.5 Project staff

Every project within the Tieto Corporation has a certain structure, inside which the roles, the competences and the duties are defined. The project on which I was assigned was not very big, and therefore some roles were missing. It was also characterized by the already mentioned structural changes within the firm, thus some roles became unclear during the project execution.
The main roles (fundamental for project initiation and realization) however, were present:

4.5.1 Orderer

The orderer is basically a customer who initiates and finances the production of a result, and ensures that the result contributes to the expected business benefits. He defines expected benefits and subsequently takes responsibility for them within the ordering company - including financing and profit evaluation.

Orderer's duties corresponding with the lifetime of a project are:

- Request tender and reach an agreement
- Manage business relationship with supplier
- Evaluate benefits arising from the use of the result and develop further the project's results

During my practical training, I have not become acquainted with anyone from the orderer's side of the project.

4.5.2 Project owner

The project owner represents the supplier (in this case Tieto Corporation) in a way that he initiates and ensures the financing of a project and ensures that the agreement with the orderer contributes to benefits in supplier's business. From the supplier point of view, the project should bring profits and benefits, and it is up to the project owner to evaluate these measures. On the other hand, the project owner also makes sure that the project corresponds to orderer's expectations.

Thus, project owner tasks are (as they go with project execution):

- Produce tender and reach an agreement with a customer
- Select the steering group staff
- Produce the project directive
- Start the project

During the project's lifetime, the project owner is responsible for consequences within the company and for managing guaranteed commitments.

The original project owner acted as my supervisor throughout my practical training in Tieto corporation and I find it very beneficial (in order to get and to give first-hand informations) and efficient (as we were on the same project). The situation then significantly changed and he dropped of the project for unknown reasons.

4.5.3 Steering group

The steering group is the project's highest decision-making forum. Commonly, a project manager is in close contact with the steering group, because many project-management-matters are decided inside the steering group. It appoints project management, approves (and possibly changes) the project plan, decides about project delivery and transfer, and finally concludes the project.
It is up to project management to keep the steering group continuously informed about the project's status. Based on this, project management is supported and controlled by the steering group.
I unfortunately had no chance to cooperate with the steering group and I cannot confirm if there was any steering group appointed for the automated Linux patching service.

4.5.4 Project manager

The project manager is responsible for carrying out the project until its end result according to requirement and solution description within the framework of the project directive and the project plan. The project manager's duty should also be to strive for identifying and then introducing improvements of working methods. This (and not only this) might lead to changes in the agreement, and it is one of the project manager's rights to propose such changes (adjustments of project organization are however fully in the competence of the project manager). Cooperation with the steering group is significant: reporting project status to the steering group, and agreeing on project resources. The resources

are then managed solely by the project manager.
Naturally I did not have all the rights and duties as regular a project manager. This fact has a few causes:

- I was not a regular employee, but a student trainee
- Project was delayed and halted due to structural changes inside the company

The situation concerning complications during my practical training is described in the following chapters.

There were two employees working on the project besides the project owner and me. Both of them were technical specialists (a Linux specialist and a network specialist), who were directly creating the result of the project. Neither of them was exclusively working on the automated Linux patching service. They were involved in other project(s) at the same time. The reason for that was lower importance of the automated Linux patching service, and staff-structure changes in the company.
The Linux specialist's task was to install and set-up Novell ZENworks Linux Management software so that it basically delivers the final goal of the project which was patching. The network specialist was in charge of the server set-up from the networking point of view, but his task was rather minor.
I was in contact with the Linux specialist on a daily basis, because his output was crucial for the project's goal. I have never met the networking specialist, because his expertise was needed only after my practical training period ended. (Practical Project Steering 2007; A guide to the Project Management Body of Knowledge 2004; Berkun 2005; Kerzner 2009).

4.6 The project phase at the beginning of my practical training

As mentioned earlier, the project has already started before the start of my practical training. All preliminaries were settled between the customer and the Tieto corporation, as well as inside the company. The steering group secured the start of the project execution by making a product evaluation and project

directive. After that, technical specialists for the project were selected - the Linux specialist and the networking specialist.
The project was then ready to start, so it went to its first phase which was testing the automated Linux patching system in the virtual testing environment. The testing ended successfully and everything was prepared for the purchasing and implementation phase.
As I learned later, the co-operational index (the index used for rating cooperation between the Tieto Corporation and the customer) was lowered by the customer because of project delays and unsatisfactory provisional results. (Project owner interview 2011).

4.7 Organizational problems

In this chapter, the problems that were encountered during my practical training in the Tieto Corporation will be described. The problems are not directly related to the project or to the project management, they are connected to the organization of the practical training.
There were a few causes, which when combined resulted into final consequences. The causes were:

- There was no person inside the Tieto Corporation who gave us support, steering and asked for a feedback; practical training was not organized very well from the side of the Tieto corporation, allegedly due to structural changes within the company a few months prior to the start of our practical training.
- The man chosen as my supervisor within the Tieto Corporation (from the beginning also the project owner of the project I was involved in) unfortunately did not provide solid support and steering, and did not ask for feedback; I was repeatedly trying to learn important information and insights about the project in order to work independently with concrete progress and results. However, I got no response most cases. As time advanced, I was informed that the project was stopped , and due to the man's business, I had to finalize the thesis and the practical training in a

previously unplanned way using only the known information.

- Insufficient amount of information about the project; official project documents related to project management were missing and generally it was not easy to learn information about the project.

4.8 The project's schedule

The outcome of the project had a preliminary schedule agreed on with customer during the initial step. As mentioned above, the project did not follow that schedule for a few following reasons:

- Lower importance of the project; it was not vital for the company to run and finish the project, because its cost (and therefore the resulting profit) was not high in comparison with other, far bigger projects.
- Project owner and steering group did not make sufficient effort in order to execute and finish the project; although there were resources allocated for the project and formally there were no obstacles.
- Structural changes within the company; staffing of various projects and employee's positions had suddenly changed, resulting into chaos

Based on all these factors, it is apparent that soon after the project began, there was no schedule for the project (or the project did not follow any schedule). Therefore it was decided to proceed according to the task list, without having any deadlines for each task. This basically meant to accomplish every step as soon as possible (considering involvement of entire project crew in other projects) and deliver the result when all steps were completed. The completion date would be possible to estimate in the final execution phase.
This approach was used until the project was suspended. It must be decided again what managing approach will be used in the future. (Project owner interview 2011).

4.9 Description of everyday project work

Even though the project was carried out in the Tieto office in Imatra, it was also

possible to work from office in Lappeenranta by using communication tools (chat messaging, voice or video calls, e-mail, regular phone) inside the corporate network.
Project management matters were discussed with one of company's project managers. We were dealing with various things, including for example project management administration within the Tieto Corporation (writing official documents, etc.) and practical everyday questions. Although the project manager did not directly help me with the project, advice, tips and insights I was given were very helpful, not only during the practical training, but also for the future.
As part of writing project management documents, I cooperated with the Linux specialist on the service description document, which was then given to the customer. Pure project management tasks, on which I was working comprised mostly from “putting-the-project-back-on-track” agenda:

- creating and gathering documents needed for further project progress (after my practical training)
- planning future practical realization with the Linux specialist (in order to clarify all things and get back his focus on this task)
- discussion with the project owner about the project's future steps

4.9.1 Daily follow-up

There were project-state checks performed a few times a week (usually three times a week). The goal of checks was to get and keep an overview of all things happening. Current matters were discussed with Linux specialist on every meeting:

- General progress
- Completed and not completed tasks, which were assigned from the last meeting
- Tasks, which should be done before the next meeting
- Problems
- Ideas, improvements, comments

I was trying to coordinate these meetings, as well as all other actions, with the project owner. From him I also got to know things regarding the project administration.

4.9.2 Steering group meetings

I was not informed about any decisions made by the steering group, and I also do not know if there actually was any steering group. The project owner was project authority for me for the duration of my practical training.

5 CONCLUSION

When I look back and assess what I have learned and what the practical training gave me, I must underline the practical and real-life experience, which cannot be learned in the classroom, and which is beneficial for my future working life.

I learned how to understand processes from the management point of view, to see that goals comprised of many things (sub-steps, time frame, dealing with staff, etc.) which are firmly linked together, and the process will not work correctly if any of the parts are missing. I consider good interpersonal relations as especially important for successful running of a project (mainly if we speak about large and long-term project), and thus a project manager should adopt techniques, and use them for sake of the common goal - successful project completion. The relationship between project manager and his team should be primarily based on empathy and understanding each person individually. Official authority and power are not sufficient.

The fact, that Tieto is a big global enterprise, gave me a valuable insight. I have had no previous experience with a company of this size, and thus everything was new for me, but especially the bureaucratic load (everything goes through paperwork, including the smallest requests), which means that everything takes time to happen because it must be processed. It is not up to me, to evaluate the way of doing things there, it was just something new for me.

As the practical training was part of my studies, I learned and experienced how to work under pressure. Complications which emerged after the structural changes affected me as well, even though I was working there only as a trainee. Therefore, there was pressure between the company and the university, because the training and its outcomes should have been documented in the final thesis. Notably at the end of semester I felt lack of time and support from my company supervisor, and when all the problems stopped the project, I felt helpless because it did not depend on me, and so I was not able to change anything. But now, considering everything mentioned above, it was a very enriching experience and learning outcome of my practical training.

As a part of my final assessment of my practical training, I would like to present my opinion, in case I would start the practical training all over again:

- From my point of view; I would put bigger effort into communication with the project owner from the very beginning of the practical training, in order to meet and discuss the situation more often.
- From the university point of view; everything was organized very well and I am satisfied. I would not change anything in this case.
- From Tieto Corporation point of view; employees responsible for trainees should be far more dedicated to help them. With correct setting of time management of Tieto trainee supervisors, trainees would not disturb then from performing their actual work, and it would help trainees to gain much more from the practical training.

I hope that I will have the chance to use the acquired knowledge and experiences regarding project management in my future career.

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PRELIMINARY AND TESTING PART

1. Concept of a patching system
2. Obtaining things necessary for testing environment (HW and SW which can emulate the real system)
3. Put the testing environment up and running
4. Installation of the ZENworks into the testing environment
5. Setup of the testing environment and together with the ZENworks
6. Test run
7. Assessment of testing
8. Possible changes in setup of the environment, involving testing of new configuration (points 6. and 7.)

ORDERS

1. Create a list of things needed for creating a real infrastructure, which would deliver the service (HW, SW and other)
2. List of other resources (e.g. corporate personnel, external personnel) needed
3. The list approval. Done by person responsible for the project, submitting of the list to the relevant Tieto department (purchasing dept.)
4. Purchase

INSTALLATION

1. Put the mother server (virtual server) up and running
   - OS installation
   - Accounts
   - Installation and configuration of a back-up agents
   - Installation and configuration of the Tieto monitoring agents
2. Put the satellite server up and running
   - OS installation
   - Accounts
   - Installation and configuration of a back-up agents

    - Installation and configuration of the Tieto monitoring agents
3. Setting up a connection between mother server and the satellite (firewall settings, etc.)
4. Setting up a connection between satellite server and its subsidiary servers (end servers)
5. All server’s functionality + connectivity verification
6. ZENworks installation
    - Automatic installation of ZENworks fragments onto satellite server and end servers
7. ZENworks setup & functionality verification
8. Full-functionality check
9. Customer-satisfaction check