MAKING COMPANY'S PROJECT MANAGEMENT MORE EFFECTIVE BY CREATING A CORE SYSTEM

Case: SuperProject and SuperApp Oy

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ABSTRACT

The purpose of this thesis is to examine/discuss the importance of an information system and its effectiveness in the context of business strategies. The thesis answers the following research question: how can a well-organized information system make a company's workflow more efficient? The theories are based on the studies of information systems, management systems and strategies that can be applied with an information system.

The theoretical background of the thesis is based on discussions in information systems and management systems, and on strategies that can be applied when implementing information systems for business use.

Based on this study, it is evident that the value of an information system in improving the workflow of the the case company, SuperApp, is extensive. SuperProject reduced project time average by 38.2 hours and coding time average per project by 80.7 hours. 56.3% was the percent of overdue projects before SuperApp Oy has used SuperProject, only 12% percent projects are overdue since SuperApp Oy started using SuperProject.

Case SuperApp Oy with SuperProject is considered as one of successful case in using an information system, which is built by themselves, based on their real demands.

Keywords:

Management Information Systems (MIS)

Information System (IS)

Management System (MS)

Electronic Data Processing (EDP)

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1   INTRODUCTION

This thesis focuses on discussing the use of information systems in improving workflow in companies. The thesis presents a case study made at SuperApp Oy, a Finnish IT company located in Lahti. SuperApp has created a system called SuperProject in order to better manage processes and workflow.

A study about information system is software and hardware that people collect, create, organize and distribute data (Bourgeois, 2012, 6).

Hardware is one part of an information system. It can be a laptop, keyboard, mouse or CPU. They are the physical components of the technology (Bourgeois, 2012, 14).

The software is untouchable and is an instruction for the hardware to tell the hardware what to do. There are many categories of software; however, the two main categories are operating system software and application software.

Management Information Systems (MIS) is the study of people, technology, and organizations.

The Management Information System has many definitions, however, according to Sarngadharan and Minimol (2009, 1), it has five different factors.These are Input, Analysis and Processing, Storage and Retrieval, Output and Information flow which are connected and support each other.

Input means to be stored into the system, where information in a form of raw is fed into the system. It can be read by the computer and it can be any of these: published documents or books, reports, work records or name, etc.

Converting new data from Input part is the main duty of Analysis and Processing. There are many ways in the analysis parts, which are abstracting, compiling, classifying, calculating, relating, and interpreting and so on (Sarngadharan & Minimol, 2009, 1). The data can be handled

by three different ways based on the amount of it. There are manual, mechanic and electronic ways to take care of the data. According to Sarngadharan and Minimol (2009, 1), the only advantage of a more sophisticated processing system such as Electronic Data Processing (EDP) is to handle a much larger quantity of data within a short time. As a result, from that, data can be completely converted and ready.

Storage and retrieval is for keeping and saving data. A large amount of data and information may not be used immediately. A scientific storage and retrieval system is needed to classify, codify and store information in such a manner (Sarngadharan & Minimol, 2009, 1).

Information flow can be defined as the flow of input, and converting, keeping and saving the output. Again, according to Sarngadharan and Minimol (2009, 2), the procedures cover the receipt and descpatch of correspondence, reports and other materials.

SuperProject combines all factors of an information system. SuperApp Oy has built SuperProject to be an information system with a wish that it can help SuperApp Oy handle and manage the processes and workflow better

2   RESEARCH METHODOLOGY AND THESIS STRUCTURE

2.1   Research question

The research question of this thesis is the following: how can a well-organized information system make a company's workflow more efficient?

The main purpose of the thesis is to understand the effectiveness of an information system and its benefits for the case company, SuperApp Oy.

2.2   Research method

This thesis is based on a quantitative research method. Quantitative methods emphasize objective measurements and mathematical, statistical or numerical analysis of collected data via questionnaires or surveys or by manipulating pre-existing statistical data that uses computational techniques. This method pays attention to gather numeral data and generalizing it across groups of people or to explain a particular phenomenon (Babbie, 2010 & Muijs, 2010).

Deductive and inductive methods are considered as two distinct approaches to do research. The inductive approach begins with observation and proceeds to broader generalizations and theories according to Backstone (2012, 19). The deductive approach uses theories into a real situation to acquire evidence then thesis author can utilize for a specific summary.
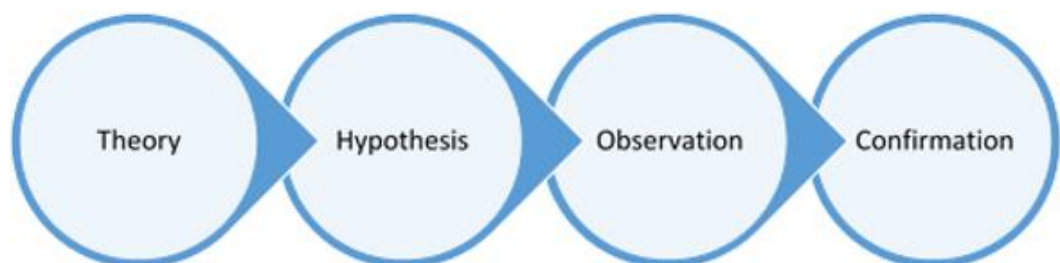
Figure 1: Deductive Research Approach (Burney 2008)

This thesis applies the deductive method because it is based on an

existing solution and provides a way to apply existing knowledge to the development process at the case company.

2.3   Data collection and analysis

Research data will be collected from SuperApp Oy's Harvest and SuperProject systems. The Harvest data was available in Harvest, a system the company used earlier, whereas the SuperProject data was available in the company's new SuperProject system. SuperApp Oy has recorded its employees working-time and can provide well-organized information with clear descriptions. The data is a CSV file with more than four thousands rows that show in detail working time, start-time, end-time and deadlines. It also provides task types (such as Programming, management, and so on) of each work record for every project.

2.4   Thesis structure

The paper is consist two parts.

- The first part discusses a theoretical background that helps clarify the study presented in this thesis. The theoretical background discusses the following concepts: information management systems, factors and elements, and organized data. Moreover, it introduces cases in which management systems have been used successfully. Two two main case examples are Apple iTunes and Toyota.
- The second part presents an analysis of the empirical data collected at SuperApp Oy. The aim is to find out how the company's new information management system, SuperProject, helps improving workflow and increase profits.

2.5 Theories of the thesis

Earlier, SuperApp Oy used three applications such as Google Drive, Harvest and Trello in order to manage and operate the company when it had a small number of employees. Studying these three systems used at SuperApp Oy will reveal the advantages and disadvantages of using a single system, SuperProject.

The thesis refers to several theoretical concepts related to management systems because SuperProject has been created on the basis of management systems studies and can be considered as an information management system. Furthermore, since SuperProject is intended for business use and SuperApp Oy is currently using it as a management system, it is important to refer to studies discussing real business strategies. These studies combine four factors, which will be explained in chapter four that may affect a company using a specific management system such as SuperProject.

SuperProject is an information system, which contains data that can be analysed and processed. Moreover, SuperProject is improving the quality of management and reducing time and money for the company; therefore, studies discussing quality process management will be referred to.

3 THE QUALITY MANAGEMENT OF A PROCESS

3.1 Quality: Definitions

The concept of quality can be defined in many ways. According to Crosby (July 1992, 3), quality is 'conforming to specification' which gained much popularity in the 1980s. Juran (July 1992, 3) has given another definition, he defined quality as "fitness for use" and the noun fitness is to be defined by the customer. Kano (1984, 3) proposed two-dimensional model: a two-dimensional model, and the dimension are "must be quality" and "attractice quality". Must be quality refers to expected features and "attractice quality" to things that a customer would like for a product to have but does not desire them at first.

The two dimensions of quality defined by Kano has been generally accepted:

- Must be quality: the aspects of a product or service meet customers' expectations.
- Attractive quality: the aspects of a product or service exceed customers' current needs.

CUSTOMER SATISFACTION

UNEXPECTED:
Thrilled Customer

VERY SATISFIED

Attractive Quality

NOT
AVAILABLE

HIGH
DEGREE
OF
AVAILABILITY

Must be Quality

EXPECTED:
Customer has no comment

VERY DISSATISFIED
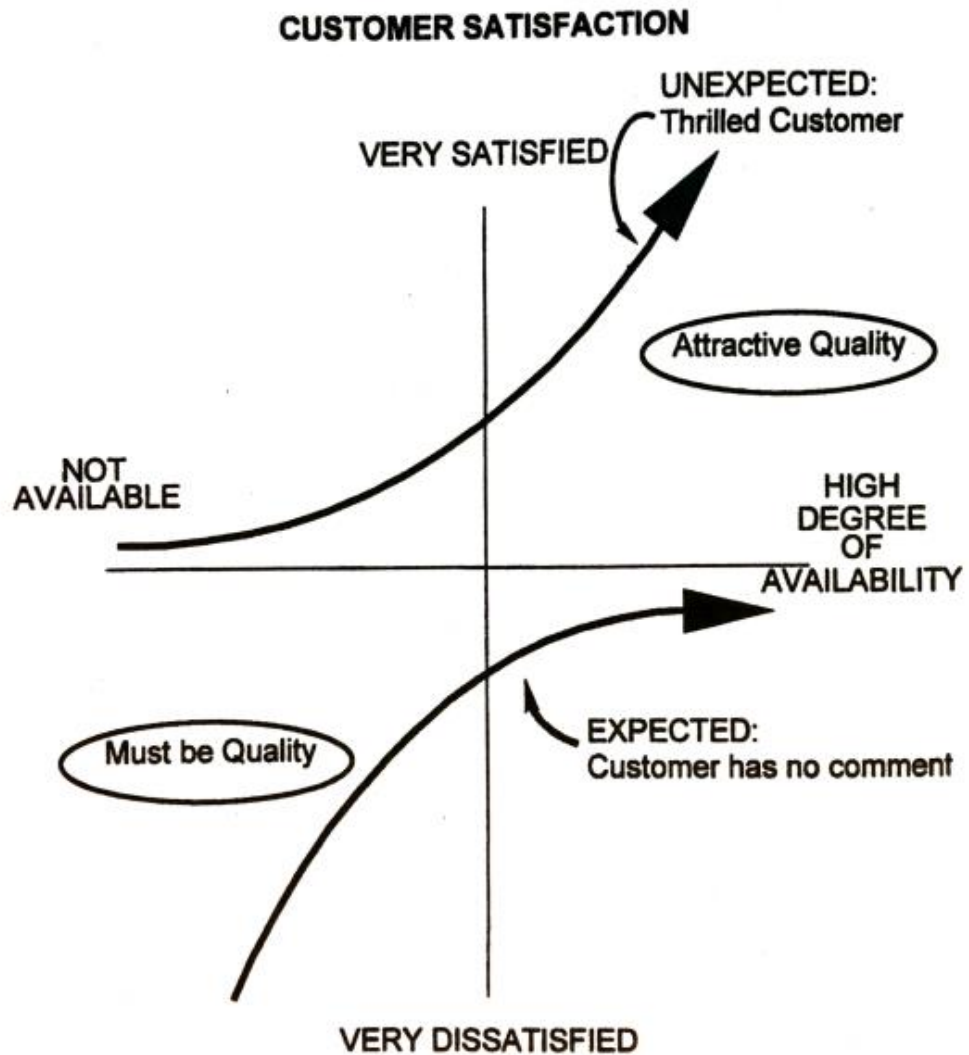
Figure 2: The two dimensions of quality (Kano 1984, 3).

The main idea of understanding dimensions of quality is to make clear how the word quality means in this part. This is particular and simple to standardize what quality really means in business through time.

3.2   Definition of management

Management in general is a package of planning and execution (Soin, 1992, 68). It has many definitions as well; however, definition of management is changing through time.

Before discussing more about management, let us turn back to the concept of quality and focus on the following: what is poor quality management and what is good quality management?
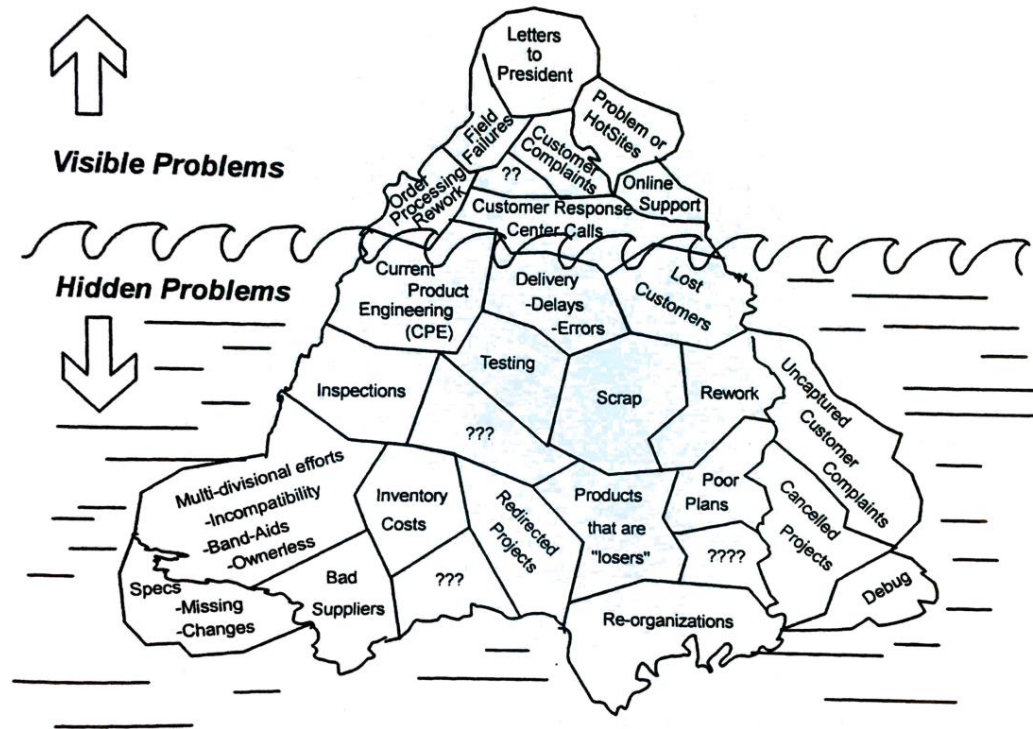
Figure 3: this figure is an example of a poor quality iceberg (Soin, 1992, 69).

It is possible to focus on and solve visible problems existing over the surface. However, hidden problems or opportunities may not be realized. Therefore, a well-managed organization or a good quality of management should have a small iceberg; the word quality in this definition has both two dimensions.

According to the explanation above, management can be defined as planning, figuring out issues, controlling and tracking the execution and checking the outcome.

3.3 Process and process management

Process generally is an activity to convert raw materials to a product. Some work in the middle that people need to make to create outcome. According to Soin (1992, 70): "A process is an activity to which we have added some value. A process is therefore part of value chain".

Every company or organization has a multitude of processes. They are managed by individuals or managed cross-functionally. The processes add the value delivery chain of the organization that provides the organization's products and services If good management is applied throughout the processes, an organization is likely to have satisified customers. This can then lead to increasing revenues.

Process management is identifying and monitoring a process, ensuring it meets a target, discovering abnormalities and preventing their recurrence (Soin, 1992, 164). A process management covers planning, controlling, keeping track and avoiding failure.

One of the prerequisite for good process management is "there must be documented and must include a process flowchart" (Soin, 1992, 166). It means a process of a big system, huge organization or company is greatly huge, if there is not a way that is recorded so a company needs depending on an individual or a specific group of people. Therefore, a simple process management with well-managed systems will help a company grows sustainably.

In order to grow a its business, a company or organization has to improve their processes continuously according to Soin (1992, 167). That is what SuperApp Oy has been doing with SuperProject. While SuperProject is playing an important role for the company with sustainable features, SuperApp Oy is still developing it as improving a process. The system is made easier through time so that it will have less steps.

3.4   Summary

The quality management is one of the most important prerequisites of a process. It becomes more and more important when an organization or company is growing. The big problem that a new start-up or a young organization may meet when they are bigger is the management takes so long time and wastes money. The poor management even decreases the speed of growth or make the company slower than its opponents then loses their chance.

Good quality management process must be easy. It should have a small number of steps, and it should not be dependent on any particular person. The process must be documented and improved over time for future use.

The quality management of processes is the biggest reason for SuperApp Oy to SuperProject is expected to improve the quality of managing the company's processes. The system will be discussed in depth in section 6.

4   INFORMATION SYSTEM

SuperProject and three applications SuperApp Oy used is a completed information system. They support and help the company manage and track the workflow and the quality of processes, especially with SuperProject, it can be seen a complete information system.

There are many kinds of information systems such as finance and accounting systems, sales and marketing systems, manufacturing and production systems, and human resources systems (Laudon & Laudon 2008, 47). Regarding the system discussed in this thesis, the most relevant kind of systems are manufacturing and production systems, and human resources systems.

Manufacturing and production systems and Human resources systems belong to the information systems in the enterprise. They are functional perspectives of information systems (Laudon & Laudon 2008, 47).

4.1   Manufacturing and production systems

Manufacturing and production's functionality is producing. It can be understood by the step that makes and creates the real goods and services called generally product. According to Laudon and Laudon (2008, 47), it is the system of planning development and maintenance facilities.

There will be a way better in managing company's production and that could be knowledge systems of manufacturing and productions. Keeping the right track on production and its progress will never be worthless, especially nowadays, companies started to compete harshly, a system of manufacturing and production turns to be a value weapon to win the

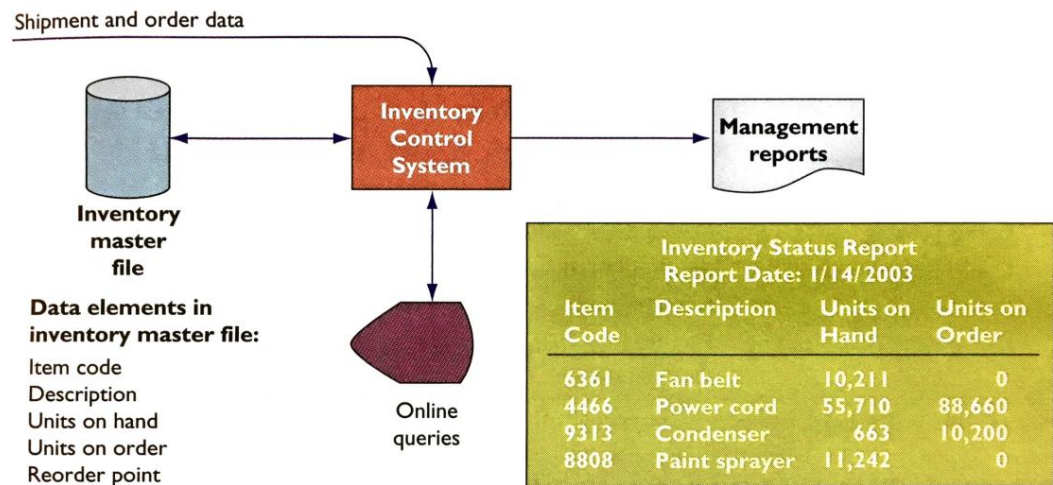market. This will be made clear in the Toyota's case later on in this part.

Figure 4: An overview of an inventory system.

The above image shows some basic information regarding the number of available items in an inventory. (Laudon & Laudon 2008, 49).

Information is listed and stored in the inventory system. Employees and managers can then access the system, make a querty, and easily find the product they need. They can use various filters such as item code, units on hand or units on order. They can also compare demand with the number of products available in the stock. This helps to keep the stock in balance, avoid wasting time and resources, and save money.

System	Description	Organizational Level
Machine control	Control the actions of machines and equipment	Operational
Computer-aided design (CAD)	Design new products using the computer	Knowledge
Production planning	Decide when and how many products should be produced	Management
Facilities location	Decide where to locate new production facilities	Strategic

Table 1: Manufacturing and production systems.

It provides a general view of how manufacturing and production is used with information systems (Laudon & Laudon, 2008, 48).

Case Toyota's grand vision:

Toyota is a big global company that operates in several fields. Konick (2002) has discussed its success. Studying about its success, Steve Konicki pointed out the success came from the grand vision in "Revving Up". April 1, 2002 and "Toyota Paves the Road to Customization", June 3, 2002. The successful story began in March 2002, when Toyota signed a historic agreement with France's Dassault Systems S.A and IBM to buy software, hardware and services. The value of the agreement is between $800 million to $1.2 billion – a big number for a system at that time. The system is supposed to link Toyota's 56 plants in 25 countries and its over 1000 suppliers (Laudon & Laudon 2008, 49).

The system has many benefits. The technology allows Toyota to model every aspect of car production. This includes the car's design, the factories' design, and the order in which components are assembled and so on. Dessault's design collaboration software called Catia allows designers to collaborate and, according to Laudon and Laudon (2008, 50), with suppliers who are also design partners.

Toyota's system has many benefits, but the following is one of them. In the past, designing a new car model could take years, but nowadays Toyota manages to do this in only 10 months. Since Toyota aims to sell its products to younger customer segments, it is important that the process is quick. With new designs available every 10 months, Toyota is getting a better chance to reach its target customer segments. Moreover, as a result, people will start to recognize Toyota more easily than perhaps before.

Case Toyota provides a bright and clear example in using an information system to increase productivity in manufacture and production field. It is also pointing out the benefit of the information system's usability in real business.

4.2 Human resources systems

Human resource management refers to the idea of managing an organizations workforce. According to Laudon and Laudon (2008, 71), the human resource management systems are mainly used to identify potential employees, maintain work records and establish new training programs to improve employees' skills. According to Laudon and Laudon (2008, 71), human resources information systems' main duties are identifying potential people who enable to work, maintain work records and establish new programs to educate employees' potential skills. It is important to track employees' work and milestones because employers need to know how employees manage their duties and which employees work effectively. Having this information allows employers to make decisions about rewarding their employees or reacting to their mistakes.

According to Laudon and Laudon (2008, 71), human resource management systems supports analysing activities that are relevant to job design, training, planning employee career paths, and reporting relationships.
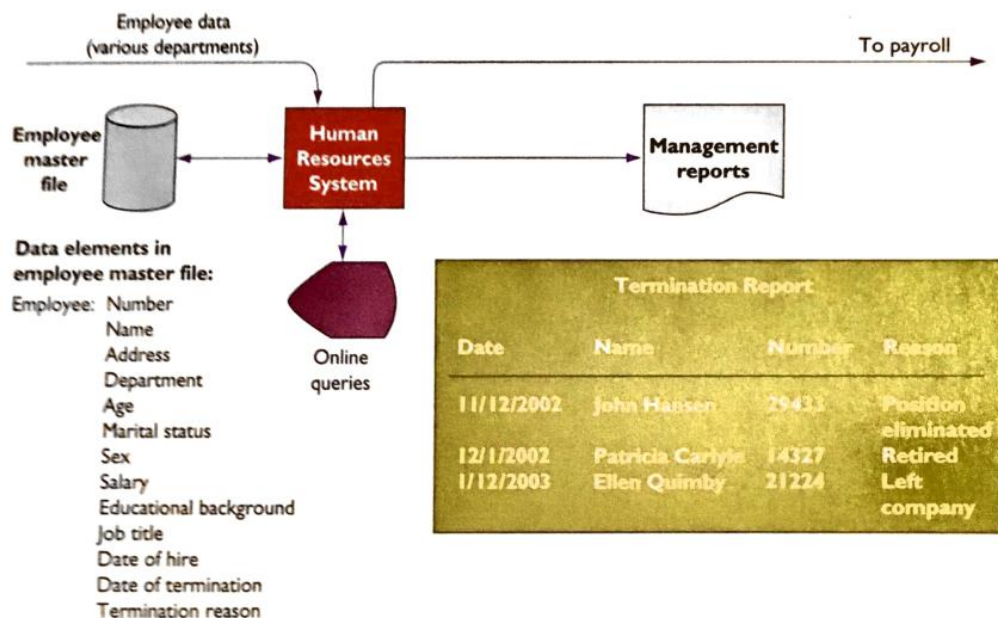

Figure 5: an example of employee record keeping system (Laudon & Laudon 2008, 50).

A human resources system provides basic information about employees. This information helps identify people. There is information about employees has been displayed and given a brilliant sight for people who don't even work or know about the company can also understand and able to collect directly information about milestones of the termination. In addition, there are many columns information such as name, date, reason, etc. that employers can identify whom without any doubt.

System	Description	Organizational Level
Training and development	Track employee training, skills, and performance appraisals	Operational
Career pathing	Design career paths for employees	Knowledge
Compensation analysis	Monitor the range and distribution of employee wages, salaries, and benefits	Management
Human resources planning	Plan the long-term labor force needs of the organization	Strategic

Table 2: An overview of human resources information systems (Laudon & Laudon 2008, 50).

The above table shows the four main parts of a human resource system and the related organizational levels.

4.3 Summary

It is a wide range of knowledge about information system, in order to apply an information system, SuperApp Oy has created SuperProject for two main purposes. It operates as a human resource management system and as a management and production system. To develop further, SuperApp Oy focuses on its employees and production.

SuperProject provides functionalities that help SuperApp Oy to focus on development. The idea of SuperProject is to be a powerful tool for management use and to make management more efficient. Its aim is to make SuperApp Oy's workflow more efficient by tracking project workflow and employees. The functionalities of SuperProjec will be explained in more detail in chapter 6.

5 INFORMATION SYSTEMS IN REAL STRATEGIES

When a new system is deployed, an implementation strategy is needed. SuperProject is made based on the real demand of SuperApp Oy and its clients. Experiencing many systems and information systems, SuperApp Oy's board started thinking of a system that has all functionalities and well organized and that is how SuperProject was born.

In order for a company to develop, information systems are needed. An information system can bring advantages in putting a company's strategies into practice and help the company in competing.

5.1 Basic strategy 101: Align the IT

The basic ideal of IT strategy for business is to make sure technology supports or serves the business. One research has announced that "the more successfully a firm can align its IT with its business goals, the more profitable it will be" (Luftman, 2003). Only a quarter of firms achieve alignment of IT with business (Henderson, et al., 1996).

Most of businesses get it wrong according to Kenneth C. Laudon and Jane P. Laudon. IT has its own life and it will not support or even serve management very well. However, people could shape IT to the enterprise instead of the way most of businesses trying to ignore it and saying no to understand IT. As a result, they took the failure by the poor performance without the understanding of IT. With the successful understanding, what IT can do and how it works, firms and managers can take an active role in shaping its usage and actually measure its impact on all kind of revenues and profits.

5.2 Low-cost leadership

Low-cost leadership is the one that many organizations desire for their information systems. In fact, not so many information systems can reduce a big amount of money and time. They are only reduce a few steps but

with the cost organizations pay for them, it is not actually outstanding in satisfying the low-cost leadership organizations demand.

One of information systems' achievement is the lowest operational costs and prices. Wal-Mart has done this advantage successfully and been seen as a classic example. They keep the prices low and shelves stocked organized using an inventory replenishment system, so that Wal-Mart has leaded the retail business in United States for such that long time. Wal-Mart keeps their replenishment system sending new orders to their suppliers immediately consumers already paid their purchases. At that point, the system records the bar code of every item passing the checkout. Later on, it sends a purchase transaction directly to the central system. The computers there will collect orders and send them to correct suppliers. Suppliers can check and access Wal-Mart's sale systems and double check the data using Web technology.

Because of the automatic replenishment system, Wal-Mart does not need to spend much time, money, and even people on maintaining large inventories of goods in many warehouses. It, additionally, allows Wal-Mart to adjust goods and products to meet customers' demands. According to Laudon and Laudon (2008, 83), Wal-Mart only spent 16.6 percent of sales revenue for overhead instead of 24.9 percent of Sears – one of competitors.

Wal-Mart keeps using the replenishment system and leading the retail business in United States. It is also an example of an efficient customer response system (Laudon and Laudon, 2008, 84).

Figure 6: An overview of the Wal-Mart

Wal-Mart system is a complete information system, which can be seen as its success. In fact, the system Wal-Mart has nowadays is a long-term effort they have made since 1980s (Lu, 2014) and now with products from more than 70 countries, 11,000 stores in 27 countries and over $32 billion, Wal-Mart's information system is one of the most value supply chain management.
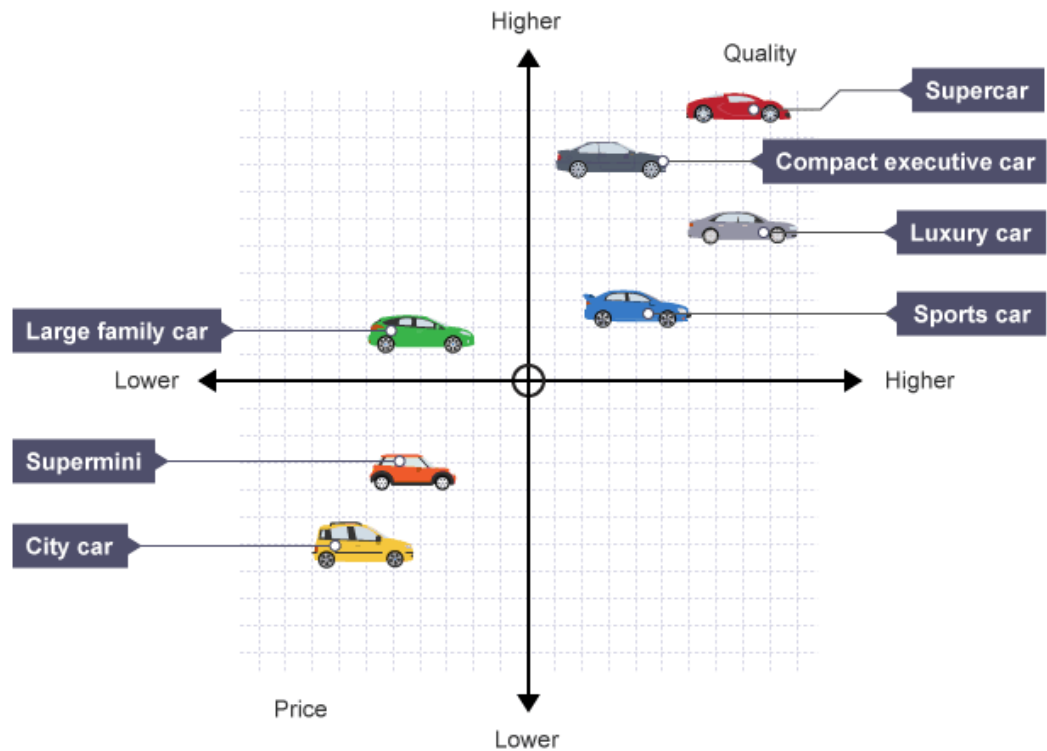
5.3   Product differentiation

It has been important to launch new products in the market since a big number of brands and goods are attracting and exciting. Use information system to allow new products or services or even change customers' behaviour or convenience in using existing goods.

Creating and launching new products is difficult. However, a well-organized information system can help in finding out what kind of products are missing in the markets, or what markets have not been reached yet, or

what kinds of products people in a specific area demand.

Picture 1: Product differentiation in the car industry

Product differentiation in the car industry. To cover varied demand, a wide range of needs and prices need to be covered.

Apple was a good example in the last decade. Early 2000s, Apple launched a brand new IPod which changed people's habit in the way listen to music. Then Apple launched an application called ITunes allows people to put their purchased music into their Ipod. Itunes has been a success because of Apples vision in creating information systems. In addition to Apple, Google became the leading search engine and then introduced new search services such as Google Maps. eBay on the other hand, made it easier for suctomers to pay their online purchases and expanded its online auction marketplace by acquiring Paypal in 2003. (Laudon & Laudon 2008, 85).

In general, manufacturers and retailers can use information systems to create new products or services based customers' demand. Products and services can be customized and personalized to fit the precise specifications of individual customers or group (Laudon and Laudon, 2008, 85).
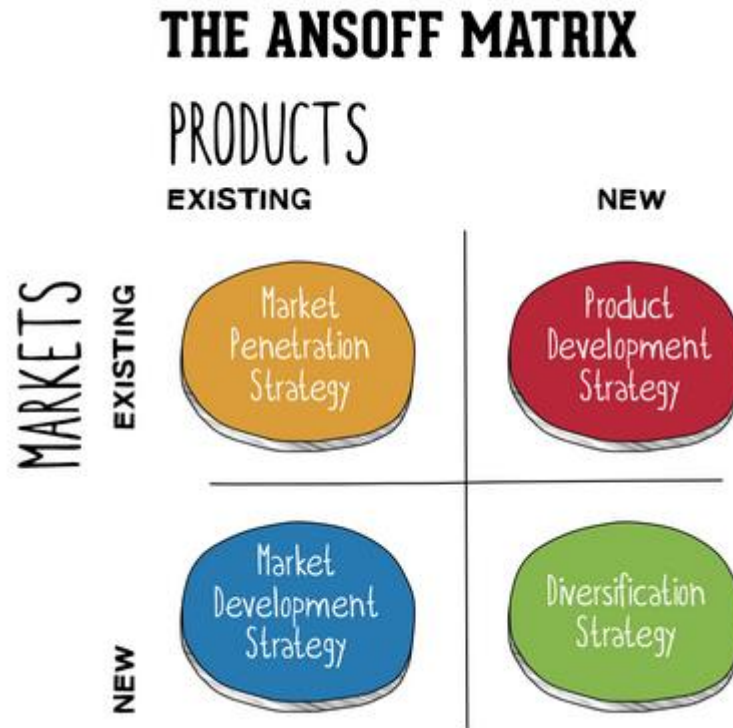
THE ANSOFF MATRIX

Figure 7: An example of the product differentiation based on the Ansoff Matrix analysis (Ansoff Matrix Analysis, 2017)

5.4   Focus on market niche

Information system allows companies target a specific market, narrow down the market and provide better goods or services more precise than competitors provide. Information system support in producing and analysing data for tuned and fixed market. It can analyse people's patterns, tastes or behaviours then companies can make marketing strategies or sale the right goods to the one who needs. It is effective and

low cost because it does not let companies to waste time and money to sale or advertise goods for people who do not need them.

The data that is collected came from a wide range of sources. It could be a transaction detail to find out buy behaviours or many the member cards, data from checkout counter in supermarkets or retailers or nowadays, it can be your cookie web browser, where Google optimizes the ads using your history browser and your search (Laudon & Laudon, 2008, 85). After that, a sophisticated software will 'query' the collected data with different setting. For example, an automotive company like Toyota can see their customer age average and which colour they like the most with one query with age and colour as parameters. Then the analysed data will be used to make decisions for marketing and sale for a specific market.
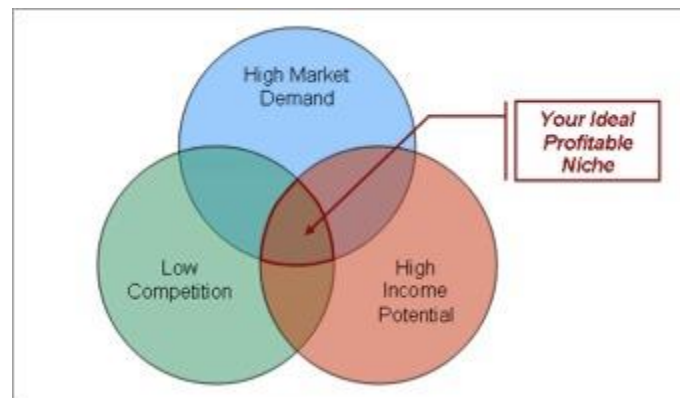

Figure 8: This figure shows exactly what an information system can do to find out the place called ideal profitable niche (Market niche, 2008).

5.5   Strengthen customer and supplier Iintimacy

This is crucial to tighten linkages with suppliers and customers. Making new contacts with customers, alongside keeping and developing intimacy with existing customers are necessary jobs. On the suppliers' side, Chrysler Corporation uses information systems alleviate work on accessing from suppliers to production schedule and even allows them to make decisions about shipping (Laudon & Laudon 2008, 86).

Amazon is making the strengthening on the customers' side so well, they track their customers' preferences for books and CD purchases then they can make a recommendation about which titles were purchased to their customers (Laudon & Laudon 2008, 86). It opens a both-way trust and it benefits for Amazon and its customers as well.

However, a question arises: How can an information system do that? Information system lists and somehow queries their customers then takes care good of them. Companies will not miss any event for any celebration of their customers. Providing good take-care of customers, companies hold the key to success.

5.6   Case Apple's ITunes: future music's keeper

Music nowadays plays the main role as it used to be for long time ago. People keep listening to music and most of us know where to buy a song or an album, which is called ITunes. Before 2003, people would have purchased CDs from likely a retail store and played those CDs on a boom box or portable CDs player like CD Walkman. Since 2003, Apple introduced ITunes to the world and that has changed human style of listening to music.

Back to 2001, when the first generation of IPod was released, it was fast to become the main revenue stream for Apple. Two years later with ITunes, Apple changed it business strategy to include digital entertainment and consumer devices as well as computer (Laudon & Laudon 2008, 79). Instantly, ITunes sold 1.4 million songs in its first released week. Right after that, the combination of IPod and ITunes have become the major profit for the company.

Apple's online music delivery system as known as ITunes is a revolution of selling and playing music. Therefore, CDs sales have been lost their market for years while in only 2006, 1.2 billion songs have been sold on ITunes and 100-plus million IPod have been purchased by customers

worldwide (Laudon & Laudon, 2008, 79). Nowadays, iTunes is one of the largest sellers of music in the United States and worldwide.

Using information systems, iTunes store categorizes several albums, TV shows or Movies that can be sold and downloaded. The Apple site offers over 6 million such goods (Laudon and Laudon, 2008, 80). The artists and musicians also take a lot advantages from iTunes. Over one million people each day reach iTunes Store to compare with 940 Best Buy stores and Wal-Mart's ads in front. Therefore, if a musician is listed in the page of Apple iTunes, nearly a million people have access to his songs.

The successful story of Apple and iTunes illustrates some ways information systems help businesses and it can become a competitive advantage for any company. Finally yet importantly, Apple and iTunes have been successful because they have a good vision. Apple's CEO Steve Jobs once mentioned that the Internet was a new channel for selling music and entertainment (Laudon & Laudon 2008, 80). Information systems play an extremely crucial role in the Internet era.
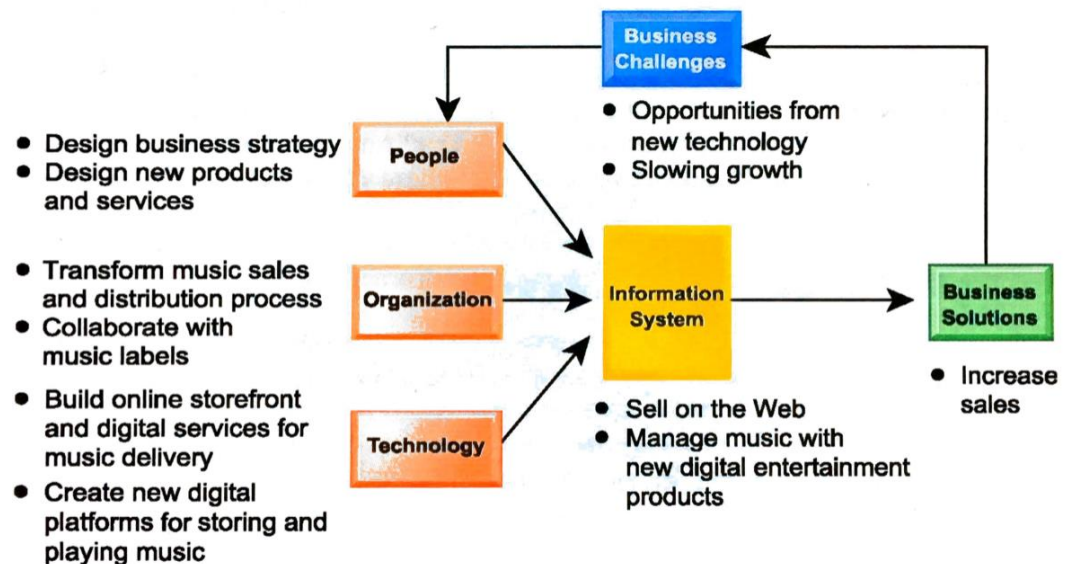

Figure 9: An overview of the importance of an information system (Laudon & Laudon, 2008, 81).

5.7 Summary

In real business, a strategy which uses an information system in it usually takes many benefits and has many advantages in the competition with others companies. Using information systems provides a ton of solutions to reduce the cost of management, be able to reach the potential markets and create the variety of products.

In general, an information system is not only a tool; it can be a real business strategy and can use with others business strategies for more effective with its functionalities.

An understanding of information system is necessary for companies and organizations because it is demanding when a company or an entrepreneur is becoming bigger and having more projects and employees as SuperApp Oy.

SuperApp Oy is now using SuperProject as an information and management system in demand of its development. SuperApp Oy has applied others strategies such as low-cost leadership, focus on market niche, product differentiation and so on to take advantage of SuperProject as much as possible and it is definitely a brilliant way to grow a company sustainably.

6   EFFECTIVE INFORMATION SYSTEM IN MANAGEMENT SUPERAPP OY AND SUPERPROJECT

6.1   Company background

SuperApp Oy is a start-up set up in summer 2015 and located in Lahti, Finland. The company's attentions are web and mobile application. The productions can be listed such as prototypes, web applications, premium websites and mobile application (SuperApp 2016).

Since the company was setup, it has developed and expanded from a company of four people to over twenty people include four people on the board, ten employees and more than five trainees that are working (SuperApp 2016).

Started as a brand new company, SuperApp Oy had faced to many huge problems; one of them was the management system. A system can track employees working time, projects real-time running and calculating budget time and speeding time is always in demand. SuperApp Oy came up with a temporary solution, which was using a combination of three website applications, they were Google Drive to store credentials and data, Trello to assign tasks and Harvest to keep track on working time and manage budget and spending money in every project. It can be explained in detail on the next part Old Management Systems.

6.2   Old Management systems

As mentioned above, the old management systems SuperApp Oy used before was a bunch of website applications. In this part, they will be explained and analysed in detail.

6.2.1   General

SuperApp Oy used to use three applications such as Google Drive, Harvest and Trello as the company's management system. Google Drive

stores all the document of the company such as contracts, layouts of projects, credentials and the company's knowledge bank. People of the company always store data into it. It is well organized and well structured and it can be easily accessed from anywhere. Google Drive is a base of data for the old management system.

Google Drive: Google Drive is well known as one of the most popular cloud storage service available nowadays beside OneDrive of Microsoft or Dropbox. Google drive provides fifteen gigabytes (15 GB) free of charge for storage space (Google 2016). People choose Google Drive because its convenience and mobility. Users can access anywhere with browser and internet. Freely editing documents and storing from workplace or home or even vacation trip place.
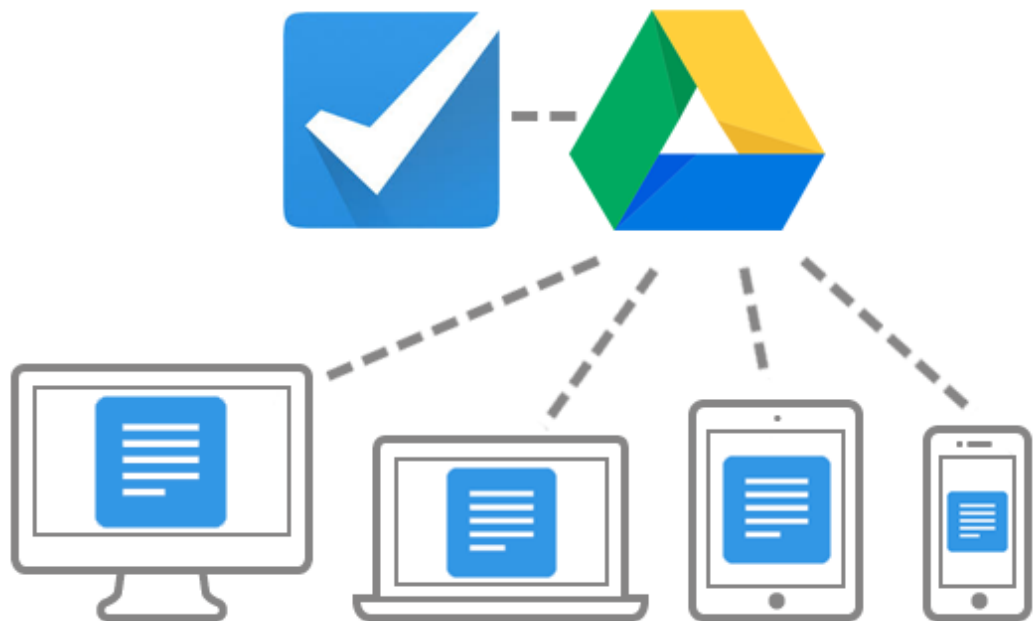
Picture 2: Google Drive can be accessed anywhere with browsers or application and internet (source Google Drive 2016).

Different devices can access Google Drive and different places (picture 2) which gives SuperApp flexibly manages document from distance and reduces time of storing and keeping hard document. It also reduces money and spaces by keeping document online.

Trello: Trello is a collaboration tool. According to Trello (Getting started guide, 2006) it organized users' projects into boards. Trello is able to tell users what is being worked, what is done and what is in the plan for the next executions. Trello can be understood as an organizing and tracking tool for plans and projects.

Trello can be seen as a time reservation system or planning system for the SuperApp Oy's old management system. In general, Trello is mobile and easy to access with friendly user interface. Trello helps employer giving task, setting deadline, managing projects at a time and totally free. However, Trello is not so potential in some circumtances. It has many tools and features as well but most of the features is under demand and there are some features are in need but doesn't support like the tracking time system (that is why SuperApp Oy used Harvest additionally).
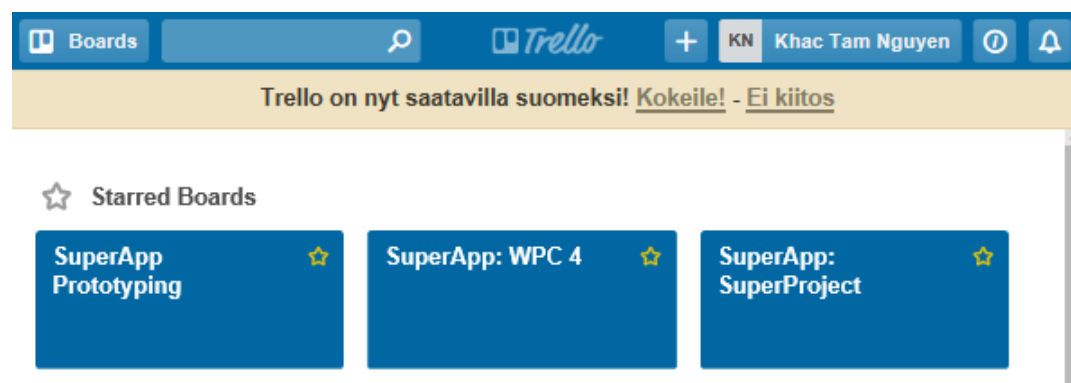
Picture 3: An example of Trello board.

Trello can be devided into different projects and organized cards as tasks (picture 3). It has a good UI and a simple use that allows less time training to use and last but not least, it is totally free.

Harvest: can be understood as a tool of tracking time. It is easy to use and to access with browser and application. It could be a brilliant idea for companies about technology where employees do not need to be at office, employers still track the time, budgets and spending to balance projects.

Picture 4: The main page of Harvest at the address http://getharvest.com/.

Harvest is easy to use with simple UI. It also provides a few features for companies to compare, keep track and balance their projects (picture 4). It is in general useful and powerful but it is pricy and increasing the price when the size of the company is bigger.

Harvest is a tracking system for the management. Employers in SuperApp Oy used Harvest to track working time of employees. Harvest, in fact, plays a simple role in SuperApp Oy's old management system, it only records time and compares the already-spent time with the budget time. It provides information about the process of every project and gives employers useful information to take action on some projects.

Indeed, these tools and applications can be used easily and flexibly for projects. However, they are three separate applications and it is challenging to use them all at the same time since SuperApp Oy's project managers need to duplicate their implement information at least three times. The advantages and disadvantages will be mentioned in the next part Advantages and Disadvantages.

6.2.2 Advantages and disadvantages

Advantages:

Google Drive plays the main role in storing and keeping information. Project managers can put information about a project in Google Drive and allow access from developers such as credentials, pdf layout or materials pictures from customers, etc. With the easily access, developers do not need to wait for the project managers to send that information to them and ask for some cretidentals they need while coding. Furthermore, project managers can also easily access to developers' sites that are being coded and check the progression without taking time to ask the developers about the login information or any kind of more work.

Nimi ↑	Muokattu vii...
SuperApp General 2016	13.9.2016
SuperApp Management 2016	23.11.2016
SuperApp Marketing 2016	13.9.2016
SuperApp Notes Memos 2016	1.12.2016
Superapp Press	7.12.2016
SuperApp Projects 2016	26.9.2016
SuperApp Rekry 2016	30.12.2016
SuperApp Sales 2016	21.9.2016
SuperApp Server Credentials 2016	23.11.2016
SuperArea51 2016	23.11.2016
Nimetön laskentataulukko	15.2.2017

Picture 5: Google Drive in use at SuperApp Oy.

SuperApp's Google Drive is well organized and easy to find the document with the powerful search provides by Google. In general, Google Drive is the best choice of storing and keeping documentation even though the security and the limitation of storage it provides (15GB free of charge).

Trello's main duty is delivering tasks of a project. It allows working in distance. As a start-up company, people on the board are busy and work in different roles in the company so trello allows them to give tasks in distance without any delay of time. Its benefit is huge for SuperApp Oy because it helps people in the board manage many projects at the same time and then make workflow more fluent and smooth.
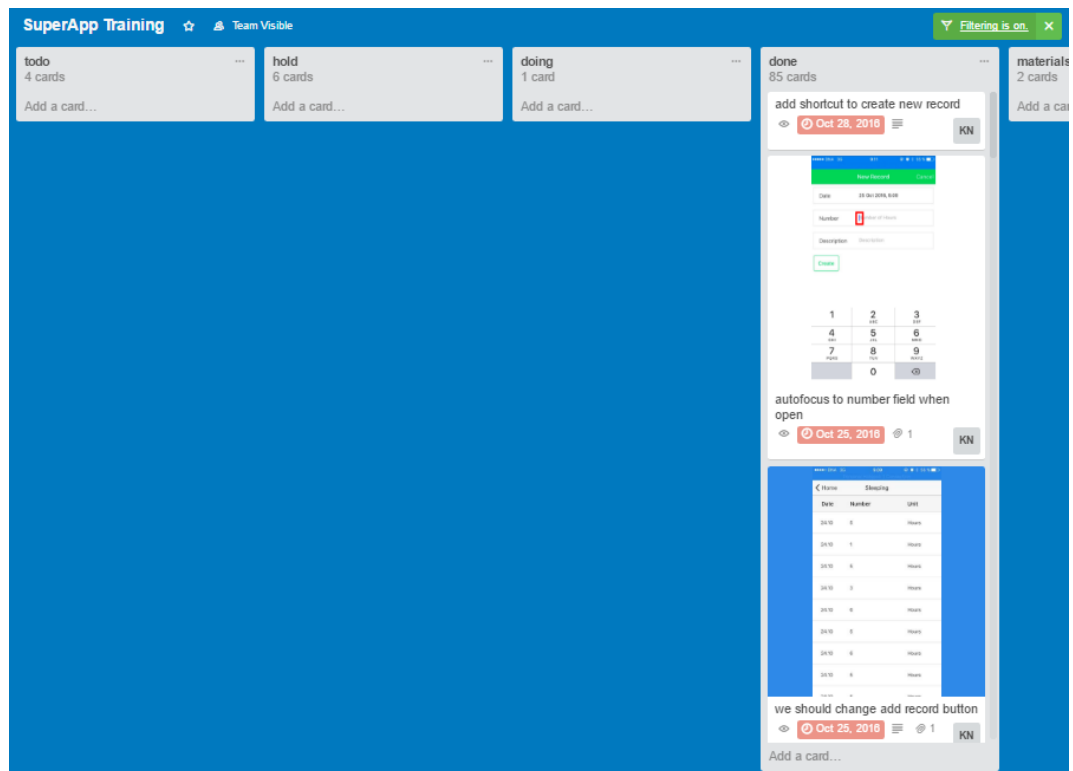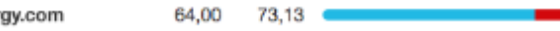

Picture 6: SuperApp Oy's Trello.

Cards as tasks are well organized into different projects as different boards. SuperApp Oy can restrict people and manage who can see a specific board. It is handy and useful because it has applications support many devices and operating systems as well as browsers.

It is also handy because Trello supports mobile app. Employees can check their new tasks or move done tasks even though they are not at the office. Furthermore, managers can give tasks in distance if they are not able to come to the office.

Harvest: this is the only application SuperApp Oy has to pay to use and the price was not so expensive, that is a plus. Harvest is enable project managers balance budgets and spending time on a project, through that, they can calculate the money budget that spent and re-balance the project again. In general, Harvest allows employers' tracking-system to supervise employees' work records.

[LPHqls5xdg] Jääskeläinen Verkkokauppa	32,00	6,28		25,72	80%
[LPHqls5xdg] Jääskeläinen www + verkkokauppa	40,00	62,23		-22,23	-56%
ID PARTNERS OY	Budget	Spent			Remaining
[hFUDkCesss] www.neocarbonenergy.com	64,00	73,13		-9,13	-14%
[iUqWrVz5Es] JUY vol.3		39,29			
[iUqWrVz5Es] JYU 1/2	16,00	93,34		-77,34	-483%
[iUqWrVz5Es] JYU 2/2		37,15			

Picture 7: SuperApp Oy's Harvest (source: SuperApp Oy's Harvest).

Harvest has the simple UI and shows all information of a project in one view, simple comparison using the blue and red colours with numbers of time budget and spent of hours as well as the percentage calculated between them (picture 7).

Disadvantage:

Despite the advantages of these three applications, the usage of them became harder through time when the company has more projects and more employees. Hiring more project managers seems not work out because the company does not actually need that.

It is getting uncomfortable in using three applications separately, one package need to be implemented at least two times in two separate applications, and it is wasted of time. Information may be implemented incorrectly that makes checking and fixing taking more time because it requires to double check or fix two or three applications at a time. Number of projects that overdue was increasing rapidly and the management problem was one of the biggest reason.
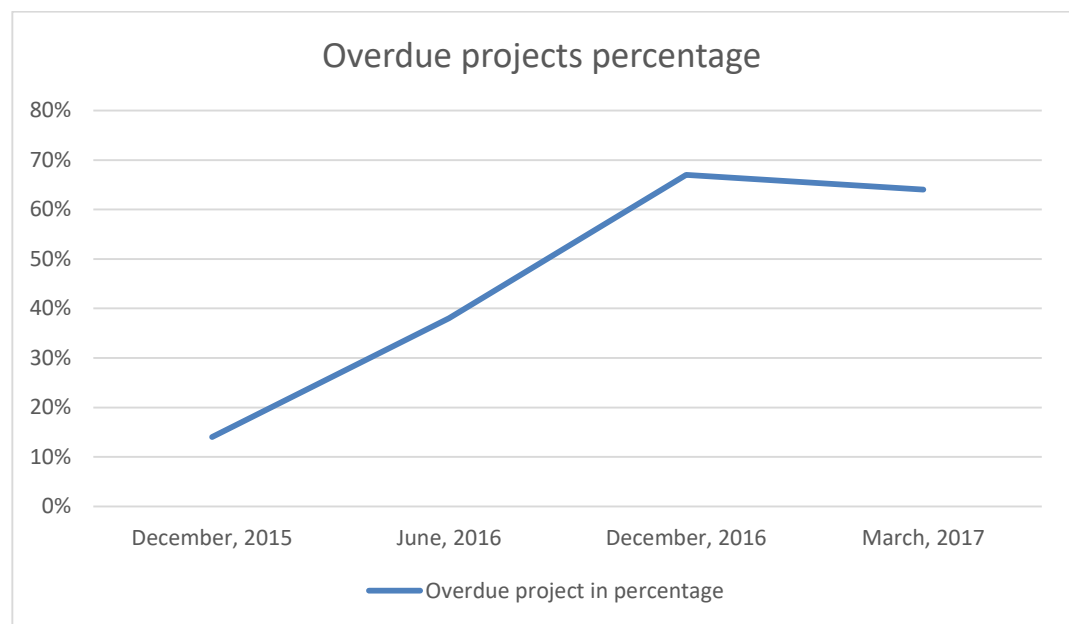
Chart 1: Overdue projects percentage.

The first mark time is December 2015 when projects were not so much and the board still handled projects and budget quite well. However, the overdue projects increased rapidly since then, when the company had more projects and employees. The management system had so many problems and it turned difficult to handle by human ability with three separate applications. The data is calculated by the formula: number of projects that are overdue / number of total projects * 100. The percentage of overdue projects in December 2015 is around 14% and it increases to 38% in June 2016. In late 2016, the percentage of overdue projects reached the highest, 67%. Started using SuperProject since early of February, in late of March and early of April, the percentage of overdue projects decreases 3%, now it is 64%. It is a bright and promising sign

because SuperProject is only used within three months and there are still many functionalities are under development.

Furthermore, using three applications in one project makes the management complicated. Project managers have to implement data into three applications and it takes more time to do that. Moreover, sometimes the implementation is not correct and it will take time to check and fix.

The tracking time system by Harvest costs the company every month and the cost of license is bigger due to the size of the company growth. It is not so potential for the company because reduce cost is one of the most crucial job a start-up need to think about.

The satisfaction of using three applications at the same time is also one factor that occurred employees working smooth.

The satisfaction level decreased through time. It took more time and steps to manage one project and it caused many problems when some inputs were wrong. Moreover, the input stage has to be done at least three times for every project and it is not necessary.

6.3 New management systems: SuperProject

The new system has been developed by SuperApp Oy called SuperProject. SuperApp Oy tried to create a system that combines all the applications that are useful but separated (Google Drive, Trello and Harvest). As mentioned above, Google Drive helps SuperApp Oy in the document management; Trello is useful for the planning and dividing tasks and Harvest as a tracking time system.

6.3.1 General

SuperProject has been started in early 2016 with the main idea is combining three different applications to reduce time and cost and furthermore, to sustainably grow.

It has been started from the bottom with pure ideas such as a drag-card system like Trello for project tasks management, automatically generation storing data and information like Google Drive and tracking working time system imitating Harvest.

6.3.2   Factors and elements

SuperProject has been built mostly by JavaScript with AngularJs framework, HTML and CSS with Parse as a backend service. Unlike any software or application that exists, SuperProject is made by the specific demand of the company and with real situation to combine three useful applications. SuperProject is made to perfectly match company needs and solve company's problems in reducing time and cost.

Three main functionalities are in SuperProject.

The tracking time system: based on the experience using Harvest, it allows people to track time and manage project more effectively, this will be mentioned in the next part.

Reports

Filter by   Tam ▼   and   Project(s) ▼

Filter by date   Click here...

Show   100   entries

|	Project	Task type	Description	Client	Member	Hours	↓ Date	
✎ 🗑	Datan visualisointi web-tyokalu	Programming	Adding data collections	Visual Data Oy	Tam	10.587	13/03/17 9:49 AM	▶
✎ 🗑	Messu app	Programming	fix bugs, add plugins for external redirect, push notification, layout, execute	Raute	Tam	4	13/03/17 2:41 PM	▶
✎ 🗑	Datan visualisointi web-tyokalu	Programming	drawing 4 bigs circles and function it	Visual Data Oy	Tam	6.930	10/03/17 11:22 AM	▶
✎ 🗑	Emojii-applikaatio	Programming	font and emojis corrections	RED Collective Oy	Tam	2.5	09/03/17 9:46 AM	▶

Datan visualisointi web-tyokalu: Adding data collections   10:35   ▶

Picture 8: the work records and the time tracking system (SuperProject).

Information and recorded time in one place that provides an overview and easy to track and check the data at the same time (picture 8).

Generating new project in Google Drive: project managers used to create project manually in Google Drive and input the credentials and store data in there but now with SuperProject, it is easier with only one-step to create project in SuperProject, information and credentials will be generated automatically in Google Drive without any effort.
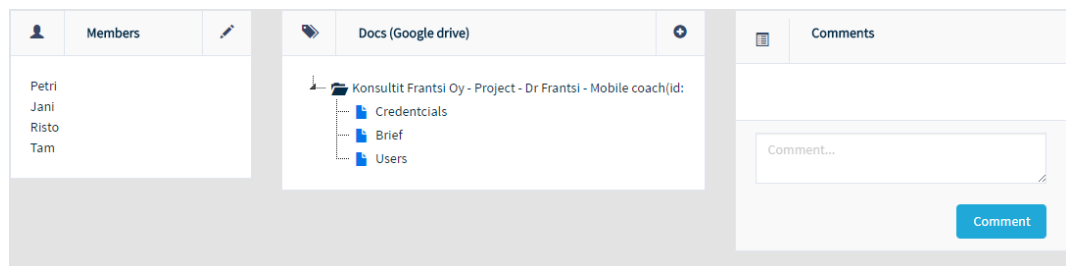
Picture 9: Google Drive stores all the needed data

Google Drive is programmed to be accessed directly from SuperProject. It makes the management easier and faster when employees do not need to launch Google drive and find the information related to the project they are looking for. When clicking into one project in SuperProject, Google Drive is already there for tracking and collecting data (picture 9).

Drag card system: it is being developed and will be used soon in the future.

6.3.3   Advantages and disadvantages

Advantages:

It is a combination of useful applications and the very first aim to make it was to create an application that can handle many things with less step. In addition, it is useful that way.
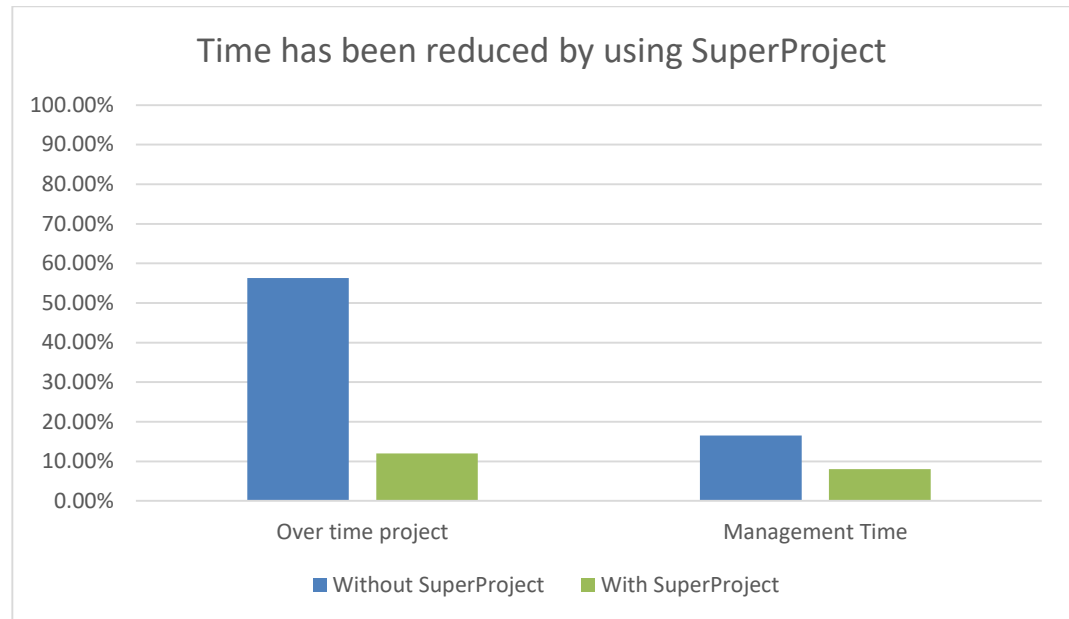
Chart 2: Time for over spending percentage and time for management by with and without SuperProject (data source: SuperApp).

SuperProject not only helps SuperApp Oy's projects run smoothly, it also reduce time in management (you can see the result in chart 2). It is important to reduce time in management because it is enable SuperApp Oy project managers to take care of another work of the company like meeting customers and telecommuting. It is value for a start-up because a start-up has to save more money as they can for long-term plan and sustainable growth.

SuperApp Oy with Harvest and SuperProject records data in the chart. The time data is analysed in 12th of March, it means SuperProject has been being used for more than three months. The data in hours is not appropriate to analyse because the recorded time before using SuperProject is a large data with more than twenty thousand hours while in SuperProject, there are only more than one thousand hours were recorded. Therefore, the data is calculated in percentage will show the most appropriate comparison the defence of the time rate between before and after use SuperProject. The percentage of overtime projects is calculated by the formula: Sum of hours of overtime projects / Sum of hours all projects * 100. The percentage of management time is calculated

by the formula: Sum of hours in management of all projects / Sum of hours of all projects * 100.

SuperApp Oy' developers have coded amazingly faster by using SuperProject. They do not actually code faster but the workflow is better to let them have less time on finding data or hang around between three applications for such many of steps. The workflow used to have many steps. Firstly, the project manager has to implement all the credentials, layout, data and document in Google Drive, and then he has to generate a site (if the project is about a website) or a blank application (if the project is about web application or mobile application) with the credentials and layout implemented before. After that, the project manager has to create a project in Harvest and implement again the document, details of the project, later on add developers who would be in charge of this project, adjust the period of the project, and double check the data is correct. The whole process may take up to three hours in total but with SuperProject, maximum one hour needs to implement everything.

However, with SuperProject, all they have to do is open SuperProject and only one click to start time tracking system, one page display all the data that is in need. An application runs in the back will generate automatically a site or a blank application and provide those credentials to Google Drive without any human work. There will be many options to generate a site or a blank application such as themes, types or default layout. The coolest thing here is with only one click. SuperProject saves time and money for

even a complicated project.
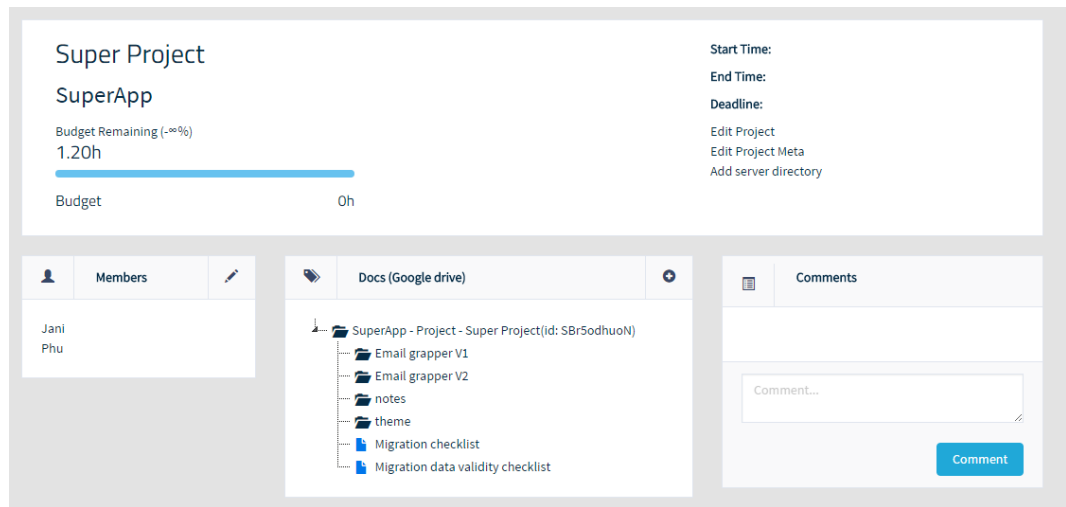
Picture 10: All in information is displayed in one view.

Users can easily see what is going on in a project and fast access to drive to get data. Furthermore, all data is well organized and displayed at one place allows people, especially project managers can keep track, check information and plan projects easily.
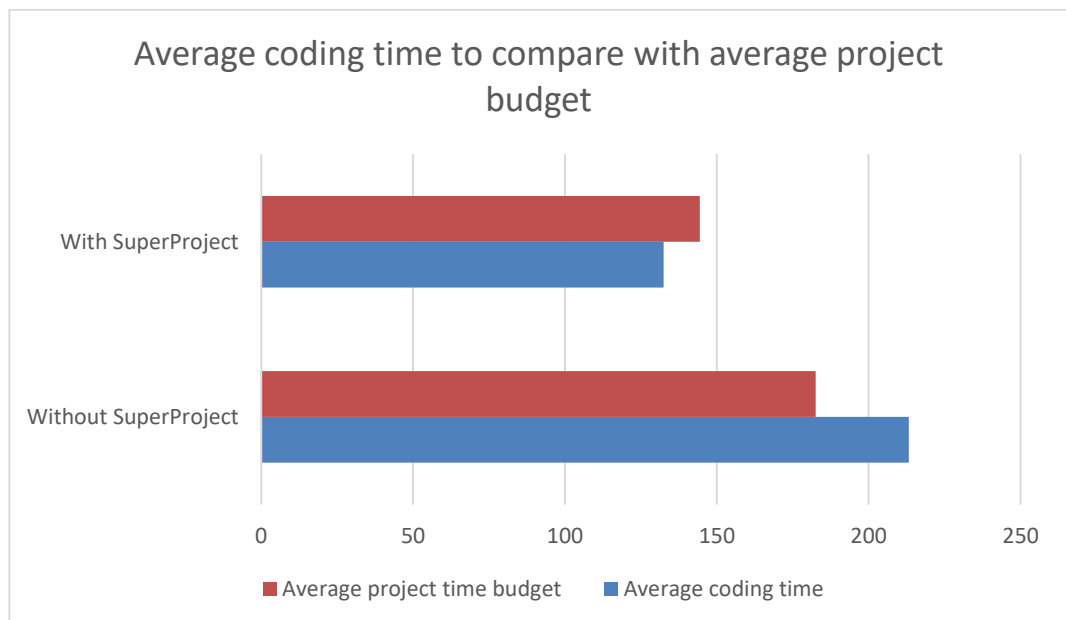

Chart 3: Average coding time to compare with average project budget (source SuperApp Oy data).

This chart shows an amazing data (chart 3) that approves the main role of SuperProject. Before using SuperProject, it took 182.6 hours in average for whole project and closely 213.2 hours in coding. After using SuperProject for a while, it reduces both time in a project and time in coding. Hours in a project and hours in coding in order are 144.4 and 132.5.

It not only shows a picture of better solution in management of a process but also a promise of better growth in near future. According to many cases as clues, SuperProject is making the work-flow smooth and giving the company the best performance of increasing revenue and also reducing time and money since it was established (it has been shown it the previous chart). In fact, SuperProject helps SuperApp Oy handle many tasks with less time in use that is the best promise since SuperProject is being improved and it can be more useful, handle more things and reduce more time to save more money for the company. SuperApp Oy grows dramatically fast in the last two years, now it has a superb useful weapon in hand, a brilliant time ahead of SuperApp Oy's future.

6.3.4 Others functionalities and benefit

SuperProject is a huge project of SuperApp Oy. It demands people with skills and creations. There are many functionalities being implemented and tested for future usage, particularly the time reservation systems, the bonus systems and the drag card as tasks like Trello.

SuperProject, otherwise, plays the role as a prototype for SuperApp Oy's production. Saleman can show SuperProject to the customers who need a management system or want to change into a new and super powerful system. SuperProject can be demonstrated nicely and smoothly.

There are other functionalities now under development and the available functionalities are now being tested and improved for future use. SuperApp Oy has never stop improving SuperProject because they know the benefit of a well-organized information system can bring. Furthermore,

SuperApp is planning to sell SuperProject in demand of the well-structured information system of other companies.

In conclusion, SuperProject will be one of the main product of SuperApp Oy when it is ready and with its functionalities, SuperApp Oy promises a brilliant future of a powerful information system.

7 CONCLUSIONS

The thesis study is about the information management systems that related to business and technology.

There are many benefits of a well-organized management system could bring. There are many ways to use management systems and apply them in real business. Each of them has its own pros and cos, however, without management systems, company is outplay of the modernized competition.

SuperProject with its functions such as the tracking time system, organizing projects with Google Drive and the friendly UI making SuperApp Oy more powerful. With many functions under the development such as the drag cards, time reservation and so on, SuperProject is becoming more useful in the future. SuperApp Oy is considered as another successful example in taking advantages from management system to raise profits and increasing company's value.

To answer the research question, the value of an information system is huge. The effectiveness of SuperProject brings to SuperApp Oy's better workflow and the performance is improved. SuperApp Oy understands their needs and creates SuperProject based on that; therefore, SuperApp Oy gets the best and the finest benefit from SuperProject. SuperProject helps SuperApp Oy reducing time of planning, managing and executing a project. Furthermore, it also raises the quality of management of processes that makes the company value increasing.

7.1 Contribution

There are two types of resources in the thesis; they are published resource and electronic resource. The published resources provide most of the theorical basis that brings the basis idea what management systems be. It also provides an overview picture about how management systems work the benefits with two specific cases out about Toyota and Apple.

The electronic resources dynamically provide mostly information about applications. There are few sources about pros and cons and some comments about these applications. The electronic resources also give the newest information and dynamically provide pictures that are used as many examples. They support and make the idea in the theories clearer and simpler.

7.2 Validity

The methods, stages, and information of a research method are appropriate and it is a valid quantitative research method (Leung 2015). The paper also applies the deductive method research approach.

The quantitative research method with the detail data from SuperApp Oy is appropriate and valid.

Deductive research method is a valid approach to use as an academic research method based on the available theories and applied into real situation; case SuperApp Oy and its management system SuperProject.

7.3 Limitations

The thesis is written based on author's knowledge with little of experience working in real business. Furthermore, time is the limitation occurs the outcome of the thesis. The author has to work in the company and write the thesis at the same time.

The data to analyse in details is hidden due to the company top-secret document; however all data is calculated. There are a few parts of the data cannot be used (the data is used in the thesis has full of details and the data does not have enough detail is eliminated) and some data that are missing or not appropriate but they are not more than 3% of all data that is calculated and analysed.

The study is mostly based on information management systems that some parts related to wide-range of business. The thesis only covers a small part of management systems to emphasize the main role of a core system and how benefit it is to SuperApp Oy because the management systems are wide range in business definition and cover much more knowledge and studies which are used as theories in the thesis. Therefore, the theories only focus on what management systems' parts and benefits that related to SuperProject and SuperApp Oy case.

7.4   Reliability

The thesis is reliable. It is based on published studies and valid data. It covers and analyse data with quantitative method and deductive method research approach (Burney 2008).

The data is handled and analyzed carefully. The data covers over four thousands rows in details with the acceptance to use from SuperApp Oy.

7.5   Cases and examples

The thesis used many cases and many of them are successful cases like Apple, Amazon, Toyota, Google, eBay and Wal-Mart. There are many studies from those cases to apply and prove the theories.

8   FURTHER STUDY

Management systems and information systems are big topics with wide range of knowledge. In this thesis, there is a small part being mentioned and used as the theories.

The management system and information system in SuperApp Oy is the systems for an IT company. There are many strategies and others systems that can be used in different types of business and fields. The thesis can be continued by having deep studies about management systems and different types of business it could be. Furthermore, SuperProject is now under development for more functionalities with different demands and that can be another edge to continue this thesis.

Finally, SuperApp Oy is using SuperProject as their core system of the company, therefore in future, there are more data and information that can be more accurate analysis and how much SuperProject can help SuperApp Oy with new challenge in the future.

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