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Defining preconditions for creating quality manual

Case Sleipner Finland Ltd.

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Description

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Abstract

Purpose of the study was to examine which are the requirements of quality management standard ISO 9001:2015 in terms of process management and top management commitment. The objective was to study current state of organizations process management, knowledge of the top management relating to the quality management standards as well as quality management system. Furthermore, purpose was to identify key points in the organizations process management that needs to be developed in order to enhance process management as well as to continue quality management system creation.

Study data was collected by interviewing employees of the organization and utilizing existing documentation of the organization. In terms of processes, study revealed that for most of the processes there were no measurements or controls in place as well as unclarities were discovered among interviewees that who is responsible of the process. In terms of top management commitment, study revealed that the CEO of the organization is committed to create quality management system and understands the requirements of ISO 9001:2015 quality management standard.

ISO 9001:2015 quality standard states multiple requirements for the processes relating to the quality management system. Organization that is creating quality management system needs to determine following matters related to processes that are in the scope of quality management system: inputs and outputs, sequence and interaction, measurements to ensure effective operation and control, resources, responsibilities and authorities, risks and opportunities, evaluation and improvement, and maintain documented information about operation of the processes as well as that they are being carried out as planned. Main requirement for the top management of the organizations is to demonstrate leadership and commitment towards the quality management system and customer focus.

In order for organizations to create quality management system whole organization needs to be committed for the project and working towards more qualitative ways, not only the top management and quality responsible. Functional quality management system will increase the value creation for both the organization and for the customer.

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Quality management, ISO 9001:2015, Process management

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Tiivistelmä

Tutkimuksen tarkoituksena on selvittää, mitkä ovat laadunhallintastandardin ISO 9001:2015 vaatimukset prosessinhallinnan ja ylimmän johdon sitoutumisen kannalta. Tutkimuksen tavoitteena oli tutkia organisaation prosessijohtamisen nykytilaa: ylimmän johdon tuntemusta laadunhallintastandardeista sekä laatujärjestelmästä. Lisäksi tavoitteena oli tunnistaa organisaation prosessihallinnan keskeiset kohdat, joita on kehitettävä prosessinhallinnan tehostamiseksi sekä laadunhallintajärjestelmän luomisen jatkamiseksi.

Tutkimusaineisto kerättiin haastattelemalla organisaation työntekijöitä ja hyödyntämällä organisaation olemassa olevaa dokumentaatiota. Prosessien osalta tutkimuksesta selviää, että suurimmassa osassa prosesseja ei ole ollut käytössä mittareita tai kontrollointia. Haastateltujen keskuudessa havaittiin epäselvyyksiä siitä, kuka prosessista on vastuussa. Ylimmän johdon sitoutumista tutkiessa kävi ilmi, että organisaation toimitusjohtaja on sitoutunut luomaan laatujärjestelmän ja ymmärtää ISO 9001:2015 laatustandardin vaatimukset.

ISO 9001:2015 laatustandardi asettaa useita vaatimuksia laatujärjestelmään liittyville prosesseille. Laatujärjestelmää luovan organisaation on määritettävä seuraavat laatujärjestelmän piiriin kuuluviin prosesseihin liittyvät asiat: syötteet ja tuotteet, järjestys ja vuorovaikutus, mittaukset tehokkaan toiminnan ja valvonnan varmistamiseksi, resurssit, vastuutehtävät ja auktoriteetit, riskit ja mahdollisuudet, arviointi ja parantaminen sekä ylläpitää dokumentoitua tietoa prosessien toiminnasta ja niiden toteutumisesta suunnitellusti. Organisaatioiden ylimmän johdon päävaatimus on osoittaa johtajuutta ja sitoutumista laatujärjestelmään ja asiakaslähtöisyyteen.

Jotta organisaatiot voivat luoda laatujärjestelmän, koko organisaation on oltava sitoutunut projektiin ja pyrkiä laadukkaampiin työtapoihin, ei ainoastaan ylimmän johdon ja laatuvastuullisen. Toimiva laatujärjestelmä lisää arvonluontia sekä organisaatiolle että asiakkaalle.

Avainsanat (asiasanat)

Laadunhallinta, ISO 9001:2015, Prosessien hallinta

Muut tiedot (salassa pidettävät liitteet)

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1 Introduction

1.1 Study background

Quality manual can be seen as one of the essential parts of quality management system nevertheless it is not necessary to implement quality management system. Quality and ISO 9000 standard family can be seen as a theme in this thesis.

Need for this thesis comes from the management of Sleipner Finland Ltd. They realized that not only they want to create and implement quality management system (QMS) to gain more transparency in their own processes and operations, but also many enquiries have risen from customers about certified QMS. Purpose of this thesis is not to fully build up QMS from zero to be ready for certification process, but to build basics for quality manual. Main goal for this thesis is to define company processes, compare them to the ISO 9001:2015 standard and to identify key points in the organization that needs to be developed in order to continue QMS implementation.

1.2 Sleipner Finland Ltd.

Sleipner is a Finnish company which was established in 2011. First product E90 was released in 1996 and it is still in use. Customer base is global, and company's products are located in six continents. Core of the company is built up on a team of white-collar professionals. With the help of worldwide dealer and agent network, company offers high quality solutions for mobilizing tracked equipment fleets in mines, quarries and constructions fields. (About, N.d.)

Currently company offers two main product families including training and spare part support, E-Series and DB-Series. E-series product family currently consists of 10 different models that can move excavators in the weight range of from 23 tons up to 565 tons. E-Series offers customers 12-20% production increase and possibility to save excavators lifecycle costs up to 18%. (Products/ E-SERIES, N.d.) Currently DB series product family consist of two different models which are designed to move especially bulldozers and drills, but it can be utilized also to mobilize other equipment located in mines and quarries. DB-series offers same production increase as E-series and maintenance cost savings up to 15%. Maximum payload that DB-series can carry is up to 130 tons. (Products/ DB-Series, N.d.)

Figure 1 Sleipner E-310 in Kyrgyztan

Figure 2 Sleipner DB80 in Burkina Faso

2 Research methods

Science and research can be seen as complicated activities, such as mapping, collecting and classifying information. Nevertheless, they are complicated there are certain rules for scientific research which are universality, community spirit, impartiality and principle of systematic suspect. Behind every research there is a purpose, whether it is a function or a mission. These guide drastically the chosen strategy and outcome of the research. (Hirsjärvi et al., 2013. pp. 21; 137-138.) Research itself is about acquiring knowledge, developing understanding and interpret these in a way that builds a picture for the researcher. Research methods are seen as the tools that one can do research. They provide ways to collect, sort and analyze data in order to get to conclusions. (Walliman, 2011. pp. 7- 15.)

Traditionally there are three different research strategies: experimental research, quantitative survey research and qualitative case study. Difference between experimental and others can be clearly seen as experimental research measures the effect of one variable to another. Rough division between qualitative and quantitative research can be done, but it is unlikely that it will benefit the researcher. Choosing between them might be difficult, so one could use them both to complement each other. They can be used side by side, other could be preliminary test for the other or one method could be used before the other. Good rule for the researcher is to really ponder what method is suitable for the problem that is being handled. (Hirsjärvi et al., 2013. pp. 134-137.) In order to carry out research one should dig deeper into the research methods, how to collect data, define research question and possible limitations of the research.

2.1 Qualitative research

Starting point in the qualitative research is to describe real life and how multifaced it is. In this type of research idea is to study research topic as comprehensive as possible, but to keep in mind that reality cannot be fragmented into pieces arbitrarily. In general, one of the biggest differences that qualitative research has to quantitative research is that in qualitative aim is to find or discover new facts compared to using previous conclusions or theories. (Hirsjärvi et al., 2013. p. 161.)

Human is in the focal point of many key feature in the qualitative research. Preferred tool to collect data is researcher who relies on one's own observations and conversations with population

which is being studied. Population that is being studied is selected appropriately and cases that are handled are considered to be one of a kind. To acquire data qualitative methods are used in a way that studied populations point of views and sound can be seen and heard, for instance semi-structured interview or focus group interview. Inductive analysis is used to gain comprehensive idea and new facts out of the collected information. In addition, research plan evolves during the flexible research process and plans are changed according to circumstances. (ibid. p. 164.)

2.2 Quantitative research

Quantitative research is widely used in social sciences, but it originates from the natural sciences. Quantitative research is based on conclusions and theory gathered from previous research, presenting hypotheses and to define concepts that are used. Datatype that is used needs to be suitable for quantitative and for numerical measurements. Variables that are handled are formatted in a table and datasets are formatted in way that they can be processed statistically. Conclusions made from the datasets has to be suitable for statistical analysis and for example it can be presented with the help of percentage tables. In addition, persons that are chosen for the study is specified in detail: chosen population which is defined needs to be valid for the results and from this population sample is taken or measured. (Hirsjärvi et al., 2013. p. 140.)

2.3 Data collection

Data itself can be divided in to two different data: primary and secondary. Primary data is collected by the researcher from the subject that is being studied. Secondary data is collected by other researchers that could be suitable for one's own research as well. When using secondary data, one needs to be careful that it is suitable for the certain research. (Hirsjärvi et al., 2013. p. 186.)

According to Hirsjärvi et al. (2013) there are four different basic methods to collect data: survey, interview, observation, and the usage of documents. Following chapters will present these methods in more detail.

Survey

Collecting data with the survey method is usually part of quantitative research method and results are analyzed accordingly, but it can be used also in qualitative research. General idea is that data is collected from certain population and sample is taken out of them. Survey is constructed in a standardized way, which means that same questions are asked from the whole population. Questions can be open, multiple-choice questions or based on scales. (Hirsjärvi et al., 2013. pp. 193-200.) Likert scale is one of the most used scaling methods in surveys, especially in the field of psychology. With the help of Likert scale one can measure how the population is feeling about certain topic. Most common way of scaling used in Likert is on a scale from one to five, respondents can choose from five different options respectively: strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree. (Cohen, 2013. p. 7.) With the help of surveys large sample can be collected rather easily and the collected data can be easily handled with the help of computer. One downside from surveys is that it is basically impossible to know how serious respondents has been when giving answers. (Hirsjärvi et al., 2013. p. 195.)

Interview

Interview is a method where researcher and interviewee are in direct linguistic interaction. There are three different types of interviews: structured, theme and open interview. In the structured interview form is used where questions, form of claims and presentation order is defined. Open interview is the opposite of structured one. Target from the interviewer point of view is to get an understanding how interviewee feels, thinks, one's perceptions and what are one's opinions. It is like an open conversation and its direction might change during the interview. Theme interview falls in the between of structured and open interview. During the interview themes are known for both sides, but there is no structured forms or questions. One of the main benefits of interview is that results of interview can be but into larger context, since interviewer can see emotions and facial expressions of interviewees. One of the downsides of interview is the amount of time it takes to plan, execute and analyze the results of interview. (Hirsjärvi et al., 2013. pp. 204-210.)

Observation

Interview and surveys tell how people feel or think, but it does not answer to the question what really is happening. With the help of observations researcher can really see how individuals,

groups or organizations works. Observation methods can be roughly divided in to two different categories, systematic and participative. Systematic observations can be performed for example in classrooms or in working places. Usually, the observer comes from outside of the population that is being observed and with the help of checklist one makes notes about observations. Participative observation is usually performed as a field work where observer tries to get into the group as a member of it. Main difference between these two methods is the distance between observer and the population. One of the downsides of observations is that once observer comes to the same space with the population they don't act as usual because of the observer. (Hirsjärvi et al., 2013. pp. 212-217.)

Use of documents

Qualitative research has increased data collection methods where researcher tries to understand actors based on their own outputs in the form of documents. Documents that can be analyzed are autobiographies, diaries, letters, recollections or official documents, this can be seen as a core of narrative research. (Hirsjärvi et al., 2013. pp. 217-218.)

2.4 Research questions

This research work is based on following research questions:

- Which are the requirements of ISO 9001:2015 standard?
- What is the current state of organizations process management?
- What is the level of top management commitment towards quality management?

2.5 Limitation of research

Original commission from the organization was to build up quality and environmental management system. After discussions with counterparts and principally with the top management of the organization, it was decided that the study will be limited to instruct organization on the requirements of the ISO 9001:2015 standard, defining organizations processes and identify key points in process management that needs to be enhanced in order to continue creation of QMS. Main goal is to define preconditions to create quality manual for the organization. All the processes of the

organization will be documented excluding support processes human resources, IT-support and finance. Quality and environmental management system will not be implemented during this study process.

3 Operations management

Operations and operations management are part of every business organization. Operations is the part of the organization which produces goods or services. Goods are considered to be physical items and services include activities that offers time, location, form and psychological value for the customer. Naturally operations management is the part which controls and oversees the systems or processes which create goods and services. (Stevenson, 2009. p. 4.) Following key concepts about operations management: organization, processes and enterprise resource planning system (ERP) will be discussed in more detail in the following chapters.

3.1 Organization

Organization is a group of people that has certain boundaries with a common mission that they want to achieve, boundaries define who is part of the organization and who is not. Organizations can be formed permanently, for instance as a department, or temporary, for instance for a specific project. (Laamanen & Tinnilä, 2009. p. 115.) ISO 9000:2015 standard (p. 16) defines organization as follows:

> *Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.*

Traditionally business organization consists of three different basic functions, finance, operations and marketing. Marketing and operations are seen as the primary functions and finance is seen as the supporting function which provides financial resources and allocates them throughout the organization. Marketing on the other hand provides knowledge about customer wants and needs and sells and promotes goods or services of the organization. (Stevenson, 2009. p. 4.)

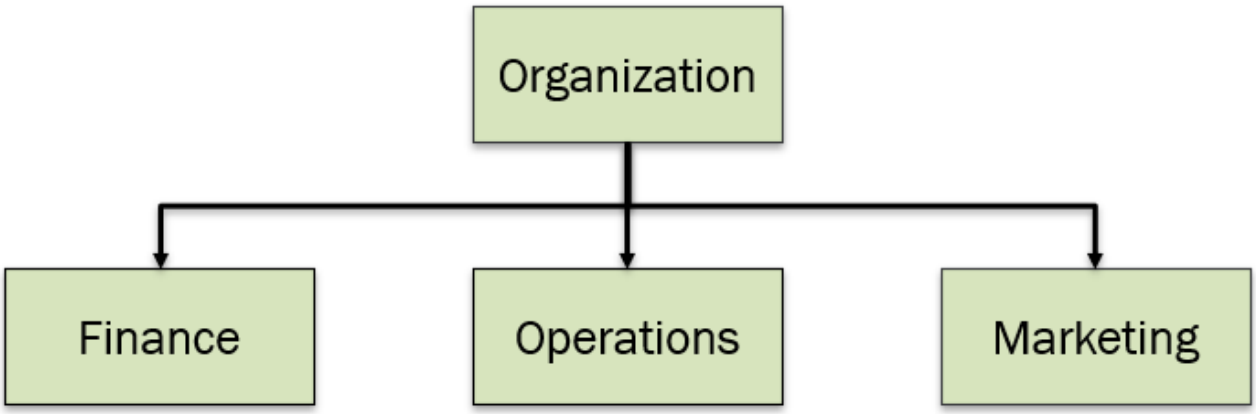

Figure 3 Basic functions of business organization (Stevenson, 2009. p. 4.)

3.2 Processes

ISO 9000:2015 (p. 19) defines process as

> *a set of interrelated or interacting activities that use inputs to deliver an intended result.*

For instance, in a traditional sales process input can be a request for quotation from the customer, process itself includes all the activities that is done by the organization in order to get the wanted output, create value for the customer by offering and delivering products or services. Figure below illustrates process as it is stated in the ISO 9001:2015 standard.

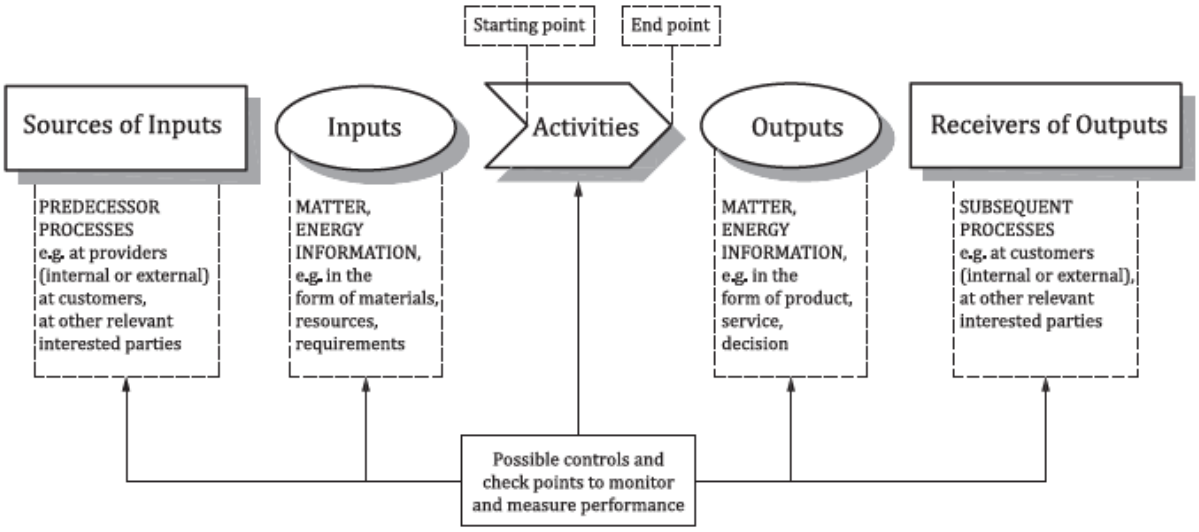

Figure 4 Structure of a single process (SFS-EN ISO 9001:2015. p. 7.)

Processes can be either core processes or support processes, depending on the criticality for the organization. Traditionally processes which are critical for the organisation and creates value for the customer outside the organization are seen as business process or core process. For instance, product development is typically seen as one. Support processes are the ones which creates pre-requisites for the core processes, for instance financial planning. (Laamanen & Tinnilä, 2009. pp. 121-122.) Porter's value chain is one of the most well-known theories on how organizations can identify their own processes that create value and the ones that are seen as supportive activities. Value chain consists of four different support activities, five different primary activities and margin. When organization is considering their own competitive advantage it's important to analyse the value chain rather than the value that is added. (Porter, 2004. pp. 36-38.)

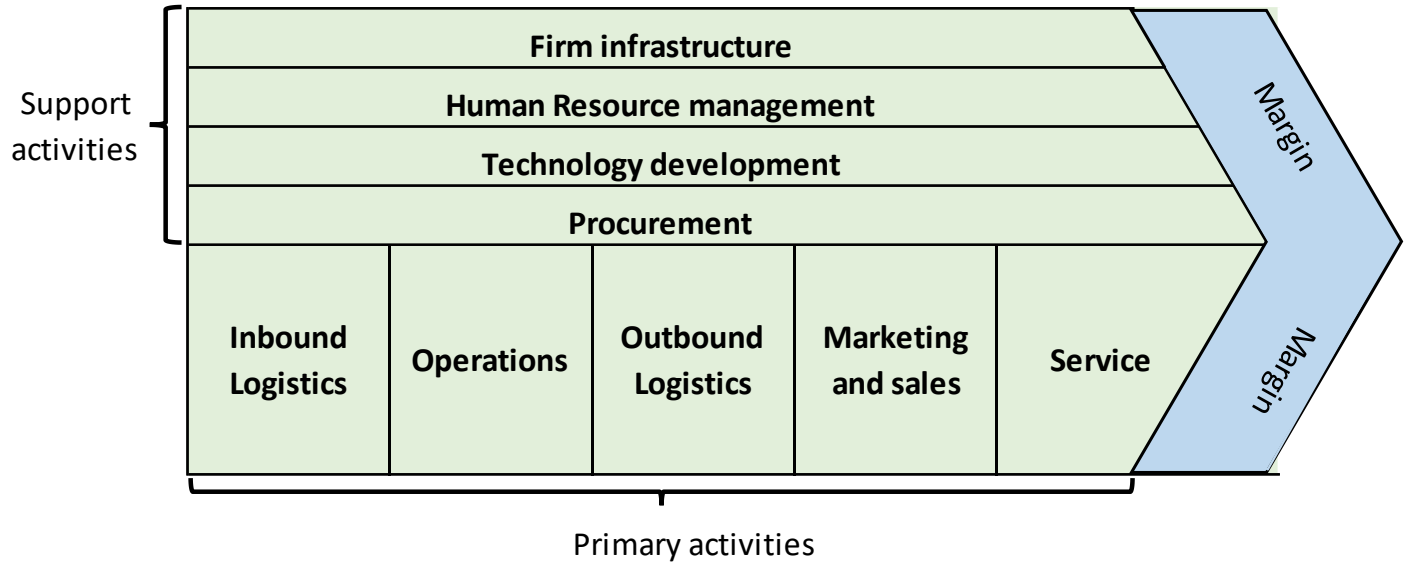

Figure 5 Porter's value chain (Porter, 2004. p. 37)

Processes should be described in way that it presents critical activities and definitions to the process for people to understand it. Description should always be according to its meaning. Processes could be described to the usage of management, then description can be done on a high level to understand the big picture and logic, otherwise it should be described in detail. Detailed process description should include all the steps that are needed for the process, roles & responsibilities, deployment area of the process, customer needs and requirements, goal of the process and process flow chart which is a visual description of the process. (Laamanen & Tinnilä, 2009. pp. 123-124.) One way of describing big picture and logic of the processes is process map. Pesonen (2007, pp. 136-137) has introduced model where customer needs are on the left-hand side and satisfied customers are on the right-hand side. In the middle processes are described as arrows moving from left to right.

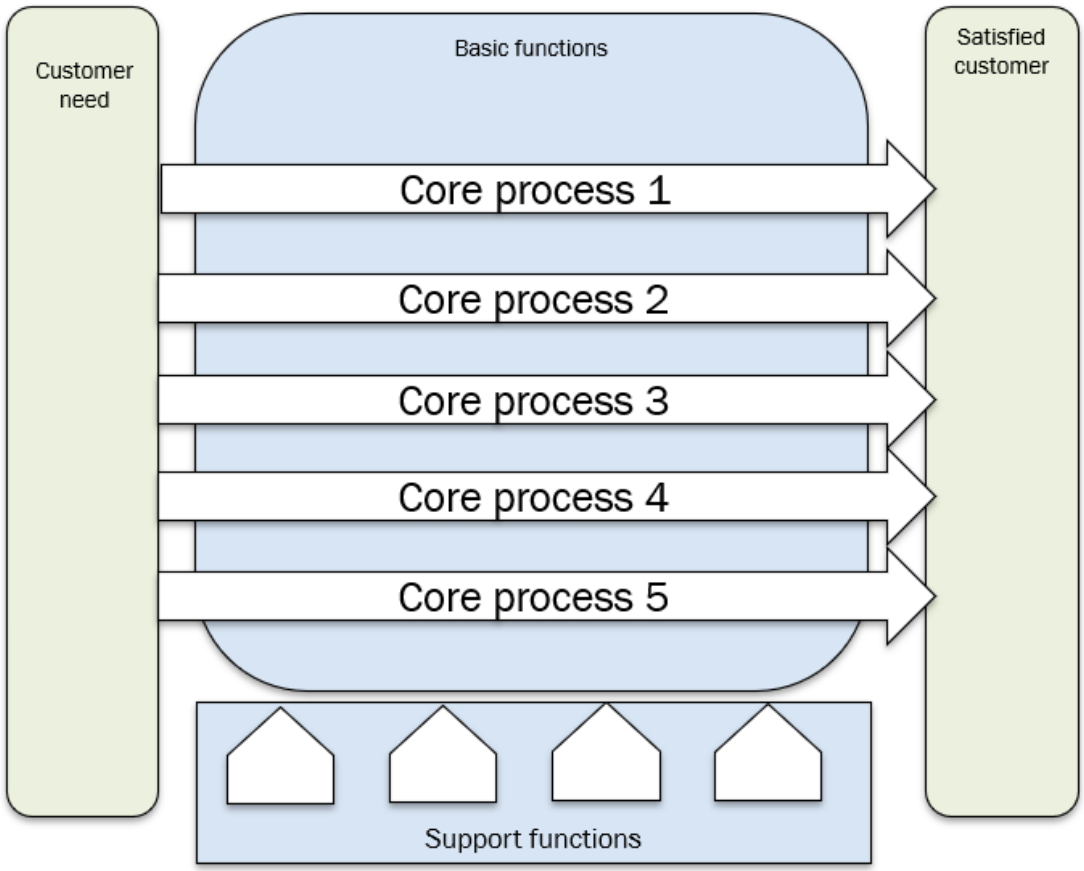

Figure 6 Process map (Pesonen, 2007. pp. 136-137), modified

Processes are seen as assets of the organization among with people, facilities and information. Management of processes ensures continuous improvement in the organization's performance. All the processes require leadership and guidance at some point of their lifetime and process management should be seen as a process itself. (Burlton, 2001. p. 73.) Process owner is responsible from the daily operations regarding process such as defining work methods, identifying competencies, developing efficiency and effectiveness of the process and reporting. Process owner can be also a process leader or process manager, but relationship between process owner and other management of the organization should be defined in order to assure smooth operations and avoid misunderstandings. (Laamanen & Tinnilä, 2009. p. 127.)

One model on how to implement continuous improvement in processes is the Deming Cycle or PDCA-cycle which is also the operating principle in the ISO management systems standards. Main function is that Plan-Do-Check-Act is repeated in a continuous loop, once cycle is completed it

starts again from the first step. Plan is setting objectives and plans to achieve them, do is executing the plan, check means to measure the results of the action and if the plan is working, last step act is about learning from the previous steps and making necessary changes if needed. (Goetsch & Davis, 2013. p. 233.)

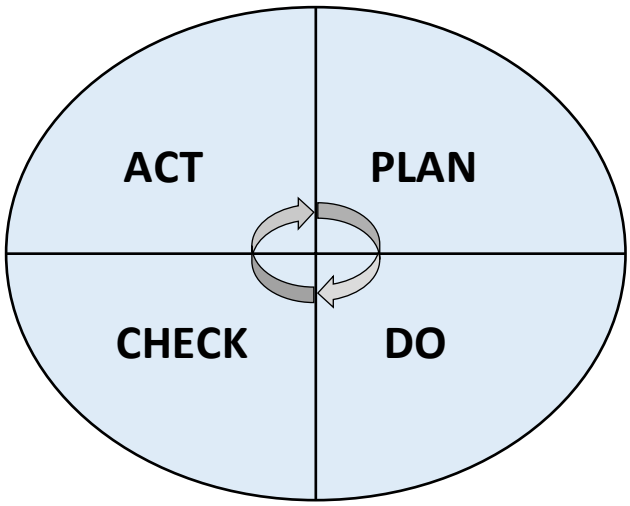

Figure 7 Deming's cycle

3.3 Project

ISO 9000:2015 standard (p. 20) defines project as follows:

> *Unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.*

There are several different areas where projects can be done. Typical projects are related to development of products, services or operations. Projects are always unique and never the same as the previous project, alongside with the fact that process is continuous loop this is one of the biggest differences between project and a process. In general projects consist of setting up, planning, implementing and closing the project. (Laamanen & Tinnilä, 2009. p. 129.)

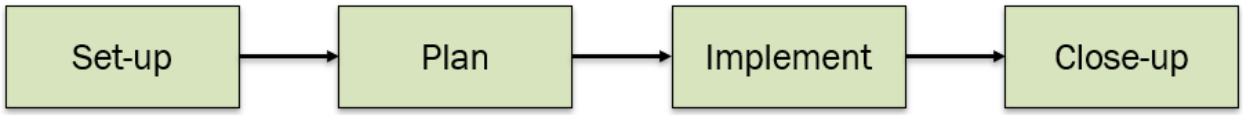

Figure 8 Project steps

Setting up and project planning is one of the most important parts of the project. Before starting the actual project, one should carry out preliminary studies and make a preliminary project plan which will enable successful implementation of the project. Especially one should take into consideration the resources that are needed for the actual project. Actual project is started by the project setter who decides whether to start the project or not and assigns project organization for the project. Key is not to expand the organization for the project too wide, but to align it with the size of the project. (Jalava & Keinonen, 2009. pp. 28-30.)

Successful implementation of the project requires that project tasks are assigned to the capable workers in a way that the tasks are not too big and that they serve the purpose of the project. Project manager is responsible to provide tasks to project workers along with work instructions and descriptions. Once the project is up and running it should be also controlled. Typically project setter, leader or manager is responsible of controlling the time schedule, quality and resources that has been used. Without controlling it is impossible to manage the project itself and deviations risen from the project plan or tasks. It is not wrong to change the plan during the project, but it is important to carefully plan the changes and inform all relevant parties about it. All along the project everything that is done should be documented. Once all the tasks are done and quality of the end result is approved project should be closed according to the date that has been agreed. Ending of the project includes documentation of results, archiving, reporting and evaluation. (Jalava & Keinonen, 2009. pp. 36-41.)

3.4 ERP-Systems

In all business organizations there are several functions which all must work together to achieve goals set by the organization. Typically, inside each function information flows smoothly, but not so smoothly between different functions. Enterprise resource planning system was developed from its predecessor's materials requirements planning (MRP) and MRP II. MRP still can be seen as a core of today's ERP systems. Purpose of ERP system is to integrate record keeping, allow information sharing and manage systems more effectively across the organization. ERP software itself provides a system to capture data, real time data availability and provides tools for planning and monitoring business processes. Software is divided into modules according to functions in the business organization. (Stevenson, 2009. pp. 668-669.)

Most of the organizations use software providers for their ERP systems, such as SAP, Oracle and Microsoft Dynamics. Implementation of ERP systems requires business process analysis, retraining of employees, new work procedures and a lot of time and resources. If implementation is done correctly and to serve organizations needs and goals, there are several benefits that it can bring. Main benefits that ERP can bring for organizations are speed of information flow, value created through integrated activities, process standardization, one source of data and tools for operations management. (Nestel & Olson, 2018. pp. 3-4.)

Especially in the implementation part of ERP-system there can be several obstacles that organizations can face. There are three main obstacles when implementing ERP-systems, time-schedule, budget and meeting set specifications by the organization. One of the most essential success factors is that the project manager of ERP-system is capable of leading the project. Project manager needs the have understanding on both business and technology that is being implemented. (Nestel & Olson, 2018. p. 84.)

4 Quality management standards

Defining quality can depend on the person, community or organization. There is not universally accepted or standardized definition of quality, but the same key elements can be found from different definitions: customer satisfaction, appliance to products, services, people, processes and environments and ever-changing state of quality. (Goetsch & Davis, 2013. pp. 3-4.) ISO 9000:2015 (p. 23) defines quality as

degree to which set of inherent characteristics of an object fulfils requirements.

Standards are created for common use of people and organizations. Standards are either printed or digital publications, which define agreed requirements, recommendations or specifications for products, systems, or services. In Finland standardization work is carried out by Finnish standardization association SFS and its affiliates, which follows European (CEN) and global (ISO) standardization. Usage of standards is voluntary, but for example it could be a customer requirement or recommended by regulators. Main reason why one would want to use standards is the benefits that they bring. (What is a standard? N.d.)

Standards benefit us all, not just only companies or organizations. SFS states that there are four different benefits gained from standards generally: safety, compatibility and common rules, consumer confidence and key to the global marketplace. (Standards benefits us all. N.d.) Same facts were risen from a study by Menom Economics. They conducted a survey in 2018 where they studied over a thousand different Nordic companies, from different fields which had prior experience on the usage of standards. Similar benefits were found from the usage of standards from the respondent companies regardless of the country: improve in market access (34%), improve in product or service quality (32%) and reducing risks (26%). One another key finding that should be risen from the survey is that 69% from companies that are doing export business found out that standards simplify their exporting of goods and service. (Menom Economics, 2018. p. 4.)

Main quality standard series is the ISO 9000 standard family. First version was published in 1987. According to Goetsch & Davis (2013, pp. 236-240). quality standard was originally created to harmonize different national and international quality standards as one which would apply every-

where. Quality standards are continuously updated or revised to match to the changes in the business field in order to make it available for everyone. ISO 9000 has been updated four times and the latest revision was completed in 2015.

In this study focus is on the ISO 9000 standard family. Discussed standards are ISO 9000:2015 and 9001:2015. Correlation between ISO 9001 and ISO 14001 will be discussed for future purposes of the organization as well. Other standards such as DIN or CEN will not be included in this study.

4.1 SFS-EN ISO 9000:2015 Quality management systems, fundamentals and vocabulary

Purpose of this standard is to help users to understand fundamental concepts, principles and vocabulary of quality management and help them to implement QMS effectively and efficiently and gain value from other QMS standards. Standard can be applied to all sized organizations regardless of the complexity or the size of the business model that is being operated. In the center of quality management is a customer and this standard can help organizations to understand their duties and commitment needed to match expectations of their customers and other interested parties. (SFS-EN ISO 9000:2015, p. 5.)

Fundamental concepts that are discussed in the standard are quality, quality management system, context of an organization and interested parties. Especially how to define, identify and gain benefits of these key concepts are discussed. Addition to key concepts ISO 9000-standard introduces seven quality management principles. Meaning, reasoning, key benefits and actions are introduced in order for organizations to adopt these principles. (SFS-EN ISO 9000:2015, pp. 5-7.) Principles will be introduced and discussed in more detail in the next chapter.

4.2 SFS-EN ISO 9001:2015 Quality management systems, requirements

ISO 9001 standard solely focuses on the requirements of the quality management system, which if one chooses can be also certified. When organization chooses to adopt quality management system it is always a strategic decision for the organization. Main themes in the standard are process approach, risk-based thinking and the seven principles of quality management. (SFS-EN ISO 9001:2015, p. 6.)

Standard recommends organizations to use process approach when developing, implementing, and improving their quality management system. Key for the organization to achieve intended results is to understand and manage interrelated processes as a system. This will lead to enhanced overall performance of the organization. For the management of processes and the whole quality management system PDCA cycle can be applied. Figure below illustrates how the structure of the standard can be presented in the PDCA cycle. (SFS-EN ISO 9001:2015, pp. 6–7.) From the processes regarding QMS ISO 9001:2015 (p. 11) requires the following:

- Inputs and outputs
- Interaction between processes
- Measurements or indicators for the processes
- Resources needed
- Assigning responsibilities i.e., process owner
- Risks and opportunities assessment
- Evaluation
- Improvement

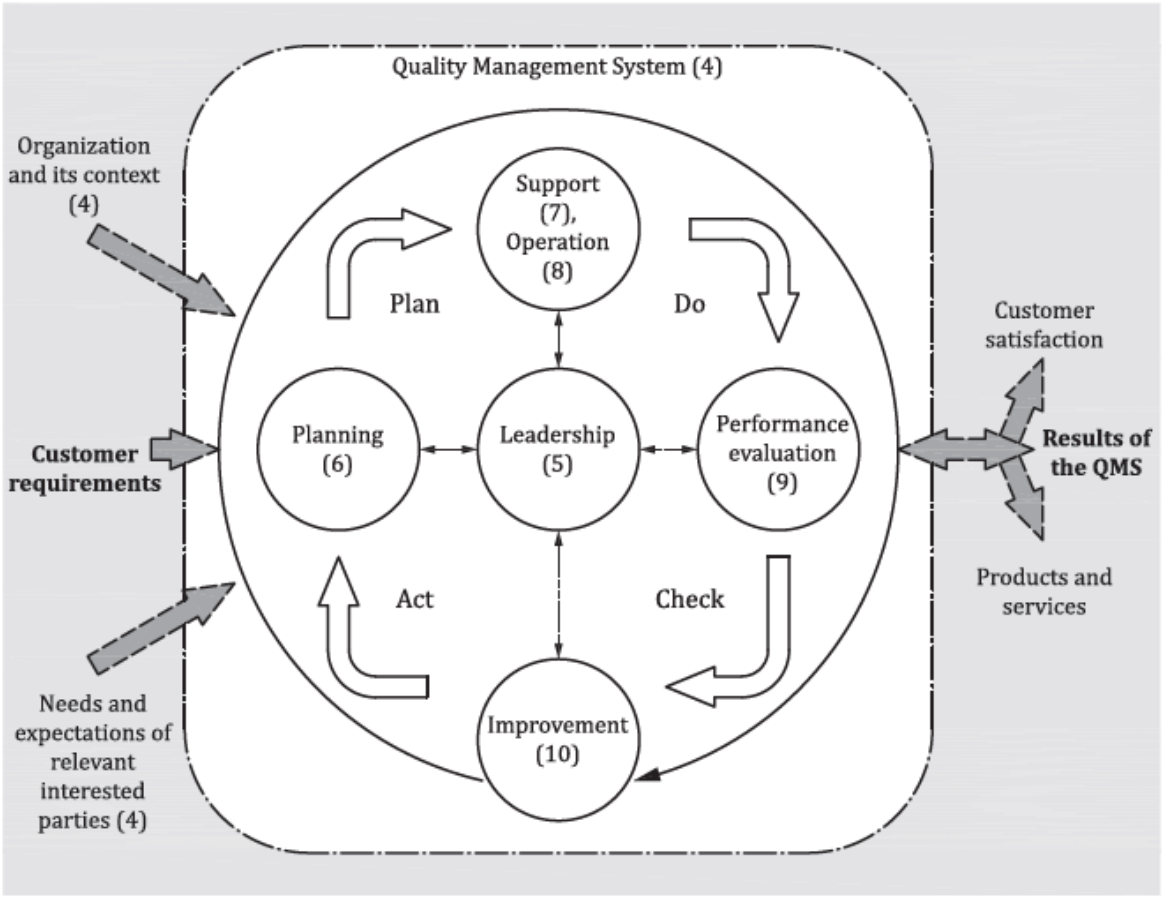

Figure 9 ISO 9001:2015 presented in the PDCA-cycle (SFS-EN ISO 9001:2015, p. 7.)

Context of the organization. Organizations shall determine their own external and internal issues that could affect its ability to achieve results. Organizations goals is to provide consistently their products or services to interested parties, whether ones are internal or external, which needs to be identified in order to know if they are relevant to the quality management system or not. Systems scope and processes shall be determined on a level which is applicable to the organisation. (SFS-EN ISO 9001:2015, pp. 10-11.)

Leadership and commitment from the top management shows the path of the quality management system to other employees of the organization. Top management oversees the usage, effectiveness and improvement of the QMS, establishes quality policy, allocates resources, responsibilities, authorities and makes sure that communication reaches to all the relevant parties in the organization. On top of everything else top management and the whole organization should keep in mind that customer is in the centre of it all. (SFS-EN ISO 9001:2015, pp. 12-13.)

Planning phase refers to the risks and opportunities addressed in the context of the organization and its interested parties. Organization shall determine actions that needs to be taken in order for the QMS to achieve it's intended results, strengthen wanted results, prevent or mitigate unwanted results and to gain improvement. Especially, the integration of these to the QMS processes and how to evaluate them is important. QMS quality objectives and the plan to achieve them shall be in line with the quality policy. Actions include what is done, with what resources, who is responsible, timetable of actions and evaluation of the results. (SFS-EN ISO 9001:2015, pp. 13-14.)

Support means all the necessary resources and their allocating needed for establishing, implementing, maintaining, and continuously improving the QMS. Resources include people, infrastructure, environment, and documentation. Competence of people and their awareness of quality policy and objectives are keys to successfully implement QMS. Awareness comes from successful communication. Organization shall determine communication time, persons responsible, way of communicating and persons that needs to be informed. One of the main things that is being mentioned throughout the standard is documentation. In brief, everything related to the QMS needs to be documented. All the documents need to be identified, formatted, controlled, reviewed, and approved for suitability and adequacy of the QMS. (SFS-EN ISO 9001:2015, pp. 15-18.)

Operation part of the standard introduces concepts about how to plan and control operations, from requirements for services and products to how to control organisations production and service provision and nonconforming outputs. Key points for organizations are to understand how to communicate with the customer about their operations, what they need to know about products or services provided and wanting to get feedback from the customer, both positive and negative. (SFS-EN ISO 9001:2015, pp. 18-26.)

Performance evaluation means that why, how, and when QMS is being monitored, measured, analysed, and evaluated according to set objectives of the organisation. Again, in this part customer is in the centre of it all and customer satisfaction needs to be evaluated in the same way as QMS. One way of doing this is by conducting internal audit to see how organization meets their own as well as standards requirements. Audits as well as management reviews of the QMS needs to be done on a regular basis in order for the organisation to make sure of the suitability and effective usage of the QMS. (SFS-EN ISO 9001:2015, pp. 26-28.)

Continuous **improvement** is based on the results in the previous clause. Main concepts are to improve products or services, mitigate unwanted effects and improve the performance and effectiveness of the QMS. It is also important for organisations to keep in mind what customers might want or expect from products or services in the future. (SFS-EN ISO 9001:2015, p. 29.)

4.3 SFS-EN ISO 14001:2015 Environmental management systems. Requirements with guidance for use

Environmental management system (EMS) standard was created to provide organizations framework on how to protect the environment. Standard specifies requirements which enables organization to achieve set targets regarding EMS. Sustainable development can be achieved by balancing the three pillars of sustainability: environment, society, and economy. (SFS-EN ISO 14001:2015, p. 5.)

EMS standard is based on PDCA-model in a similar way as was the QMS standard ISO 9001. In the matter of a fact these two standards follow the same structure, key terms, and definitions. This greatly benefits the usage of both standards side by side and their integration to organizations

management system. (ISO 14000 Ympäristöjohtamisen standardisarja. N.d.) Main difference between these two standards are that ISO 9001 focuses on quality management, customer satisfaction and continual improvement of its products or services when ISO 14001 focuses on reducing pollution, harmful effects caused by organization to environment and continual improvement of environmental performance. Structure wise requirements are the same in both, but ISO 9001 standard uses 40% of it focusing on the design and development of products and services. (Tricker, 2017. p. 63.) See Appendix 1 for the comparison of the structure between ISO 9001:2015 and ISO 14001:2015 standards.

5 Implementation of the study

5.1 Study data collection methods

Theory base was used to acquire certain level of knowledge for the researcher to carry out the practical part of the study. Theory was collected mainly from the material provided by JAMK library in the form of books or e-books, addition to these websites and publications were used from recognized and reliable sources such as Finnish Standards Association and International Organization for Standardization. Actual study data was collected by interviewing and discussing with process owners and workers based on the series of 11 questions about how to recognize processes. (Appendix 2). For the process descriptions documentation of the organization was utilized, mainly for the processes that has been described at some point in the past.

Guidelines and implementation of this study was carried out keeping in mind the requirements of ISO 9001:2015 and ISO 14001:2015 standards. ISO technical committee ISO/TC176 has suggested seven steps for implementing and maintaining ISO 9001 quality management system. (Selection and use of the ISO 9000 family standards, 2016. pp. 8-9.) Since there is not existing quality management system in use in the organization focus is on the first two steps, engaging top management and identifying key processes. Other steps will not be done during this study.

Figure 10 Steps to implement quality management system according to ISO 9001:2015 (Selection and use of the ISO 9000 family standards, 2016. pp. 8-9.)

5.2 Top management engagement

It came clear early on in this study that top management of the organization is motivated and engaged to start creating QMS for the organization. Since the company's organization is small it was noted that the CEO is alone the top management of the company. Open discussion was carried out with CEO regarding the matters mentioned in the first step of implementing QMS (figure 10). Meeting was organized as a Microsoft team's meeting, and it was recorded in order for the researcher to reflect based on the recording. Main goal was to make sure that CEO is on the same page about requirements for top management mentioned in the ISO 9000:2015 and ISO 9001:2015 standards. CEO has some previous experience from different organization working with quality management and quality management standards are somewhat familiar.

There are two main reasons why the organization wants to create and implement QMS. First one is the customer. Most of the customers that the organization has are big international mining companies that require certified QMS from their suppliers. As for today it has not yet stopped delivery process for the organization, but since there is no QMS in place customers require answers to multiple questions regarding quality and operations management. Sometimes it complicates building trusty relationship with customers and it takes a lot of time and resources from the organization to explain matters for the customer. Second main reason is to move towards qualitative ways of working. One of the main goals for the organization is to grow in the future and this requires agreed ways of working according to set processes to improve efficiency and quality of the work. (Koponen, 2022.) Risk-based thinking will be discussed with organizations processes in the next chapter.

At this stage of the creation of QMS scope was determined to apply to all processes of the organization excluding human resources, IT-support, and financial administration. Together with the CEO interested parties and their needs and expectations were defined. In total five different key interested parties were identified that affects to the organization: customer, owners, employees, supplier and dealers and agents. (Figure 11.) At the same time during this study company's board and top management are planning a new strategy and objectives for the organization. Before quality policy and quality objectives were not part of strategy, at least it wasn't documented, but for the new strategy they will be included. CEO is responsible of informing about the changes that new strategy will bring to the operations of the organization. (Koponen, 2022.) Objectives of the organization, quality policy and objectives will be left out for the organization to be defined later.

INTERESTED PARTIES

Interested party	Needs and expectations
Customer	High quality solutions and service.
Owners	Reasonable return on capital and continuous growth as an organization.
Employees	Ensuring workplace continuity, good work community and possibility to improve professional proficiency.
Suppliers	Standardized way of working, continuous and profitable cooperation.
Dealers and Agents	Standardized way of working, continuous and profitable cooperation.

Figure 11 Sleipner Finland Ltd. interested parties

5.3 Processes

Second step (Figure 10.) is to identify key processes. Some of the process descriptions can be found from the organization's documentation, but some years has passed when process descriptions were done, and they have not been revised or updated since and it is unclear for the management of the organization if employees are working according to these processes or have, they created their own ways of working. New ERP-system ODOO 13 is being implemented for the organization at the same time with this research, which will change ways of working in the organization and will affect the processes.

Together with the top management of the organization processes were defined that needs to be described and documented for the quality management system creation as well as the ERP implementation: product management, sales, after sales, marketing, order to delivery process, quality

assurance, service, and materials management. To assist in the descriptions and documentation of the processes ISO 9001:2015 model (Figure 4), PDCA-cycle (Figure 7 & 9), series of eleven questions (Appendix 2), process flow charts and annual planning cycle were used. Descriptions include process owner, inputs & outputs, resources, goals, interested parties and risks related to the process (Appendix 3). Most of the process descriptions does not include how to measure the process because measurements do not exist in the organization. Organization will at some point in the future establish KPI-indicators and they can be easily added to the process descriptions, since they were done with Microsoft PowerPoint.

Product management

For the organization product management includes both physical products as well as services. For the description of the process, it was decided that it is best to split it in four different sub-processes, respectively PDCA-cycle was applied. For this process, owner was clear and together we went through all the sub-processes that combined builds up product management process for the organization.

Process starts from sub process Research & Development (R&D) where goal is to generate economically feasible product or service concept for further development. Part of plan part in PDCA-cycle. Source of inputs are customer, market research or sub-process lifecycle management (LC management) which from input need of a new or developed product or service is generated. Actual activities start from new idea and ends when management approves new product or service concept. Output created from R&D generates input for the next sub-process product development (PDCA- DO). Activities turns product or service concept to prototype for the customer. Goal of this sub-process is to generate safe, sustainable, and economically feasible prototype that meets market needs and demands. Output receivers of this activity are customer and next sub-process productization.

Productization (PDCA-Check) is activity that converts protype to actual qualified product that can be released for the market. Goal for this activity is to release safe, sustainable, and economically feasible product or service that meets market needs and demands. Outputs of this activity are product release and documents such as finalized bill of material, spare part list, maintenance man-

ual, operating manual, safety manual and risk assessment. Market and next sub-process LC management are the receivers of outputs. Goal of the last sub-process in product management is to manage lifecycle of a product or service by mitigating risks, gathering customer feedback, and proposing product or service developments. Outputs are development ideas or new products or services which leads to starting of the product management process again from the step R&D.

Marketing

Marketing process is extracted from the sales processes nevertheless they work very closely to each other. Process works as a support process for sales. Process owner had a clear view about the process itself, but it was not written open or documented.

Main goal for the marketing process is to support and increase sales by providing materials and increasing brand awareness. Currently inputs for the process are articles, marketing campaigns mainly in social media and attending to exhibitions. Inputs are converted to outputs which are sales support and brand awareness for instance as a lead provided to sales or social media campaigns.

Marketing process itself was seen difficult to describe in the form of process flow chart, since there are multiple different things that could be done to achieve outputs and wanted goal. Annual planning cycle was created and divided quarterly. Actions to be carried out in each quarter was documented. At this time for the ERP-system there were no tool for marketing, but project tool can and will be utilized. One can create project for marketing where tasks can be assigned and timed according to the annual planning cycle.

Sales

Sales function of the organization consists of four different processes. Direct sales which include equipment (E-series and DB-series) sales directly to the end customer. Spare-part sales includes aftersales of spare parts to end customer either directly or via dealer. Dealer management process includes managing and supporting already existing dealers as well as acquiring new dealers to distribute products and services of the organization. It was also seen reasonable to describe own process about sales management in order to execute sales processes of the organization.

Direct sales process starts when lead is generated by marketing or salesperson or as a request for quotation (RFQ) from customer. Process ends when sales order is created in ERP. Outputs of the process are sales order, and that organization has received purchase order (PO) and down payment from the customer. This will lead to the start of the order-delivery process of the organization. Goals for the process are winning the sales case and that customer receives similar service from different sales personnel of the organization. Currently direct sales are measured by measuring the value of the orders (€). Customer relationship management (CRM) is used for this process. Module is based on the probability of winning the sales case and there are six steps to be carried out by the salesperson. When moving on from second to third step product manager does technical check for the sales case in order to mitigate any technical or safety related risks. When moving from fourth to fifth step sales management does business review of the sales case in order to mitigate possible business risks.

Sales management process is a support process for direct sales and indirectly for dealer management process. Main purpose of it is to ensure the execution and development of sales. In the past sales management process was executed at some level, but there was no systematic way of managing sales. In order for the organization to start systematically managing sales, process tasks were divided quarterly into annual planning cycle keeping in mind the PDCA-cycle.

Dealer/Agent management process was something that has not been never documented for the organization. Organization has certain areas of the world covered by dealers or agents and in those areas, they handle customer contacts and sales exclusively. Salespersons have managed dealers/agents based on their own responsible area with their own way. Organization wants to move towards more systematic way of managing and developing existing ones as well as acquiring new ones. For this purpose, PDCA-cycle was created where certain steps are carried out on a continuous loop.

Spare part sales

Spare part sales process starts when customer or dealer/agent on behalf of the customer contacts the organization that they have need for spare parts for Sleipner equipment. Process ends when spare parts have been delivered for the customer and payment from the delivery have been received i.e., receives of the outputs are customer, dealer/agent or both depending on the case.

Main goal for the process is to serve customer needs to ensure smooth operations and usage of Sleipner equipment and to create cashflow for the company. Process flow chart was created for this process to ensure that all the required steps are carried out in order to serve the customer needs.

Order to delivery

Order to delivery processes is the key business process for the organization to create value for the customer. Process starts when sales order is generated from the sales department and the production planning starts. Activities starts by opening a project for the manufacturing of the equipment and ends when customer approves the delivery after commissioning and training. Wanted output from this process is to fulfill customer needs and expectations. Obviously, receiver of outputs is customer, but also after sales, service and marketing, since new products are delivered. Main goal for this process is to deliver value to customer by manufacturing high quality products. Company ERP has its own module for manufacturing, but it is still under development and not in use in the organization. At the moment project tool is utilized to manage order to delivery process.

Service

Service process is continuum for order to delivery process. Commissioning and training are included to order to delivery process, but after that training moves to under the process of service. Service process was divided into PDCA-cycle to illustrate the activities carried out in order to support the lifecycle of equipment. Activities include planning and executing trainings, spare part sets, maintenance, warranty cases and unplanned support needed for the customer. Typically, unplanned support includes training of customers new employees to use Sleipner equipment. Receivers of outputs of this process are customer, after sales and product management process. Main goal for the process is to support lifecycle of products by providing service and spare parts for the customer.

Quality assurance

Quality assurance is part of daily work of every employee of the organization. At the moment it mainly consists of dealing with nonconformities that is risen either by internal or external party. Process itself starts when nonconformity is observed, documented to ERP and assigned to the right person. Addition to documentation process activities consists of planning and executing corrective and preventive actions and communicating them to all the relevant interested parties. Main goal of the process is to improve the quality of products, services and operations which will lead to enhanced customer experience.

Materials management

Materials management is a support process for the core processes of the organization. Directly it supports after sales, order to delivery and service processes. Main input for materials management is the demand to support operations. Activities done during the process was divided to PDCA-cycle which includes both purchasing management and inventory management. Outputs of the process is improved and more efficient materials management which matches the requirements of core processes. Operative purchasing was extracted from the PDCA-cycle and process flow chart was created for it according to the activities done in ERP-system to ensure the right way of procuring materials and services from suppliers.

6 Study results

Based on the interview with organizations CEO one can say that top management is engaged to implement QMS for the organization and is willing to allocate time and resources for it. Interested parties were recognized and their needs and expectations were defined. Organization's objectives, quality policy and quality objectives were not defined at this moment, and these will be left out for the top management to be defined and communicated throughout the organization later on once the strategy of the organization is updated.

As a recap from the theory part of this study ISO 9001:2015 (p. 11) requires from the process relating to QMS the following:

- **Inputs and outputs**
- **Interaction between processes**
- Measurements or indicators for the processes
- **Resources needed**
- **Assigning responsibilities and authorities**
- **Risk and opportunities assessment**
- Evaluation
- Improvement

For the QMS creation organizations processes were documented according to ISO 9001:2015 standard. Highlighted points in the list above can be found from the process descriptions that were done based on the interviews of process owners and workers as well as previous documentation of the organization. For some of the processes, process owners were clear and some they were not. Order to delivery, spare part sales, quality assurance, service and materials management did not have clear authority who is responsible of the process. CEO of the organization assigned responsibilities for these processes. Lack of authority in the processes points out that before these processes were not continuously improved, controlled and there were no unified working ways. At this point of the QMS creation as well as the ERP implementation it was decided not to create measurements or indicators for the processes. It was decided that these will be defined at the same time when module in ERP-system for the process is taken in to use. It was not

seen reasonable to measure the processes manually since ERP will give tools to this once it is taken into use.

After defining organizations processes correlation between them started to take shape. Processes were divided into core processes: product management, marketing, sales, order to delivery, service and quality assurance, and into support processes: HR, finance, materials management and IT. Process map was created in order to get a clear view from processes of the organization.

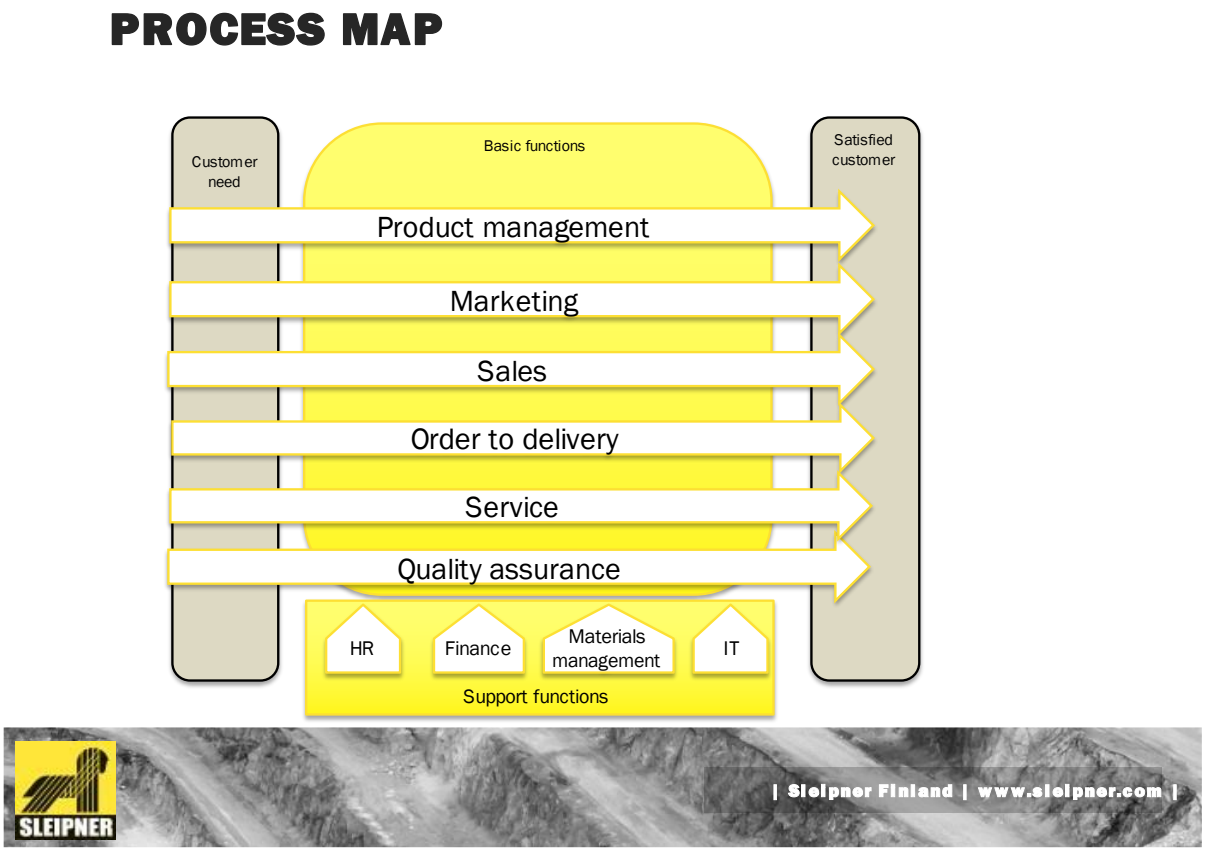

Figure 12 Sleipner Finland Ltd. process map

In order to evaluate and improve processes they need to be deployed first. Process owners plays a key part in this to educate other employees of the organization. Key matter for other employees is to really understand what value they can bring for the customer and for the organization through processes. Due to the fact that ERP implementation is ongoing, it is not possible to take all functions in to use in all of the processes. Main features that are still under development in the new ERP are purchasing, inventory management and production management.

At this stage of both ERP implementation and QMS creation, process descriptions were introduced to employees of the organization. Since the organizations of the company is small (15 employees) and many of the employees are working with multiple processes it was seen reasonable to introduce all the processes to all the employees of the organization. This way employees understand their role in the organization as well as other employees' roles and value that they can create through processes for both the organization and for the customer.

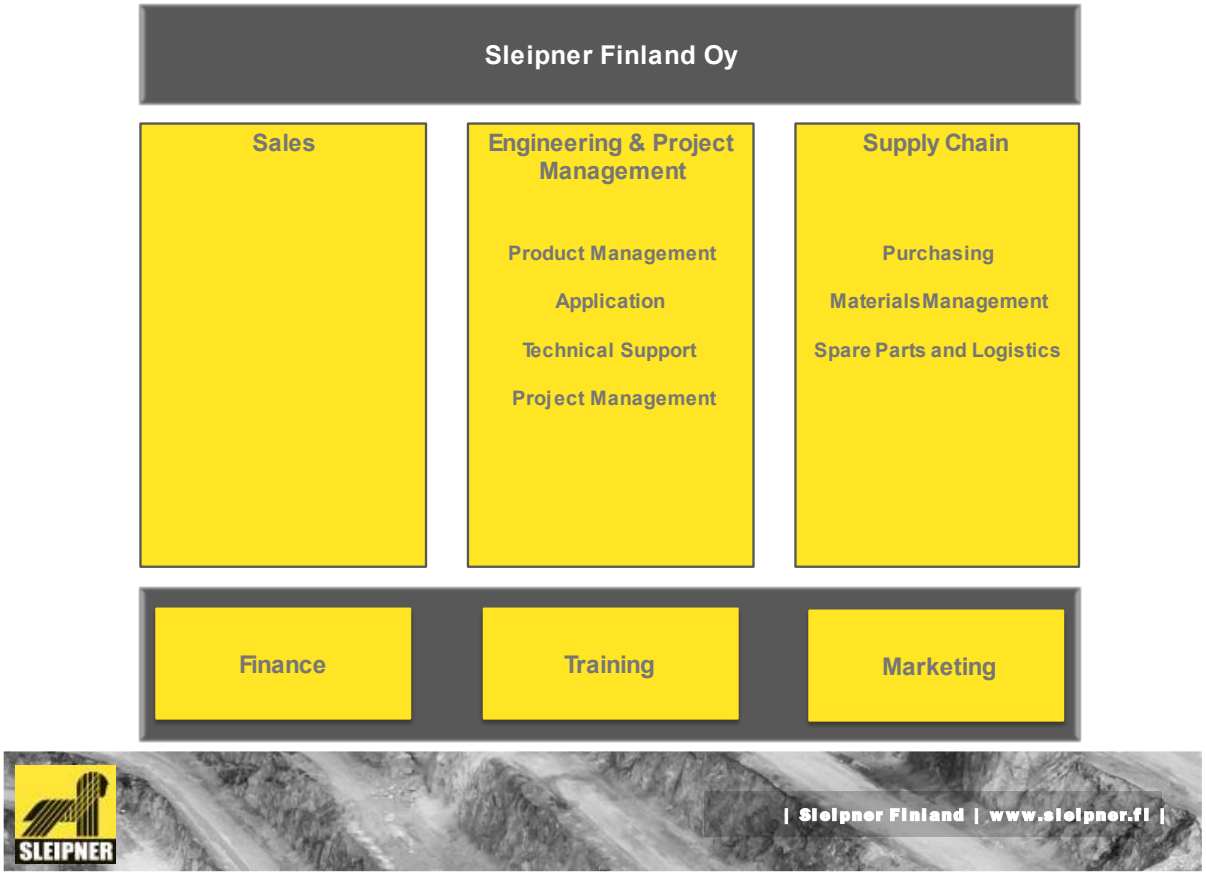

Figure 13 Organizational structure of Sleipner Finland Ltd.

7 Further actions

For the organization to continue QMS creation first steps would be to deploy the processes into use. During the study, processes were documented keeping in mind the ISO 9001:2015 requirements and introduced for the employees of the organization. Next step would be to deploy the processes into use. Some restrictions are still valid because of the ERP implementation, but most of the processes can be deployed right away. At the same time when deploying processes, one could consider and document more detailed descriptions of the risks and opportunities concerning the processes. ISO 9001:2015 (p. 11). also requires controls and measurements for the processes and researcher suggests that these should be created at the same time. In order to evaluate effectiveness and functionality of the processes, evaluation date should be agreed when process owner evaluates the process. This way organization can get clear view if the processes are working for the organization and gain ideas how to improve the processes to make them more effective and more functional.

For the implementation of QMS ISO has recommended seven steps to be completed keeping in mind the context and environment of the organization where it is being implemented. Focus on this study was on the first two steps: engage top management and identify key processes. They were not yet fully completed since the restrictions caused by ERP implementation and on-going changes in the organization. Partly this study covered step 4 where QMS is documented, since the processes of the organization were documented. Organization should continue QMS creation according to the steps provided by ISO in order to make to process efficient and keep the implementation of the QMS on the right track.

It is obvious that in order to continue QMS creation resources are needed from the organization. It is hardly possible for one person to create and implement QMS for the organization and commitment from the whole organization is needed in order to continue. For this size of an organization threshold of hiring new employee to only carry out quality activities might be too large. Top management of the organization should consider whether they have the resources and knowledge needed internally already or do they need to hire a new employee who has previous experience from working with quality and QMS. Regardless of the decision that top management of the organization makes, researcher strongly suggests that external consultancy is utilized for the QMS

implementation, to train employees as well as the person that will be in charge of creating and implementing QMS. There are plenty of service providers available that helps organizations to create, implement, maintain, and certificate their QMS, for instance DNV or KIWA.

8 Conclusion

In this thesis, process management was studied according to the requirements of ISO 9001:2015 and ISO 14001:2015 standards. Requirements of management standards were introduced in the theory part. In addition, engagement of top management towards quality management was examined since it is essential for creating, implementing, and maintaining QMS which complies with customer, organizations, and quality standards requirements

ISO 9001:2015 quality management standard requires multiple matters from processes relating to the QMS. If organization chooses so not all processes needs to be in the scope of the QMS. Those that are needs to comply with requirements of the quality management standard and information about them needs to be documented accordingly to support the operations of processes. Second thing that needs to be highlighted is the continuous improvement required by the quality management standard. Processes and the performance of the whole QMS needs to be evaluated regularly. Organizations should build up measurements or indicators for the whole system and agree recurring dates when evaluation is carried out.

Leadership is in the focal point of QMS along with the customer focus. Main point for the top management as well as other management positions of the organizations is to lead with example and show commitment towards QMS and for customer focus. Top management is also responsible creating guidelines, quality policy, quality objectives for the QMS. If the top management of the organization is not committed for the QMS it leads to difficulties when trying to engage other employees of the organization for the QMS.

Once process management is organized on a level that complies with ISO 9001:2015 standard and top management is committed for the implementation of QMS, development work can be continued. For the organizations that are creating or have already QMS in place the goal of it should not be the certificate, but improved operations and creation of value through QMS for both customer and for the organization.

9 Discussion

Objective of this thesis changed few times in the beginning which made it difficult to start the process. Eventually after discussions with counterparts and with the top management of the organization clear objective for the thesis was formulated. Objective was to instruct the organization on the requirements of quality management standard ISO 9001:2015, examine organizations process management and find out what is the level of commitment from top management towards quality management. Theory part of this thesis consisted of two different entities: operations management and quality management standards. From my point of view theory part is comprehensive and especially quality management standard part will benefit and serve the needs of the organization.

Implementation of the study was based on interviews and discussion with members of the organization as well as previous documentation of the organization. Interview is general way of acquiring knowledge and finding out what interviewees feels or thinks about certain matter. From the process interviews carried out in the implementation part of the study one can say that questions asked should have been opened and explained more. Researcher noted that there were differences between interviewees on how they understood questions that were asked.

After processes were documented, they were approved by the process owner to make the information reliable. For some of the processes only one person was interviewed so the documentation cannot be seen as completely reliable information, for instance marketing process. In order to make results of this study more reliable documented processes were introduced to all the employees of the organization to get confirmation that documentation is valid. In addition, introduction included background from QMS creation, quality standards and requirements from ISO 9001:2015 towards processes. Data gathered from the top management of the organization cannot be seen as totally reliable, since it is based on only point of view and thoughts of a single source.

Study was implemented according to JAMK ethical principles and thesis reporting instructions. Theory data was collected from JAMK library and from reliable online sources such as SFS-online and from websites of Finnish Standards Association and International Standards Organization. Study data collected from the employees of the organization were presented anonymously, excluding interview of the CEO of the organization which was authorized from the interviewee. In

the process descriptions there are indirect references to the employees of the organization that could reveal the identity of them, but this has been authorized from the specific persons involved. Classified information concerning the organization has not been introduced in this study, nevertheless, processes descriptions can be found publicly, matters has been introduced on a general level and detailed information has not been presented which could cause risks for the organization. Results of the study and whole thesis will be saved into the database of the organization as well as it will be published in Theseus where everyone is able to access it.

First research question about the requirements of quality standard were handled in the theory part where overall view of the standard was introduced. In the practical part of the study analysis was conducted regarding organizations process management as well as the level of top management commitment. Key finding from the process management was that there are no measurements or controls in place in the organization. As what comes to the level of top management commitment, one can say that top management of the organization is engaged for the creation and implementation of QMS for the organization.

There is a good reason to believe that results of this study will benefit the organization. Working according to set processes and embracing qualitative ways of working will increase efficiency and value that is created through processes for both customer and for the organization. True benefits can only be seen once processes are deployed and work is carried out accordingly for some time. According to the limitations of this thesis quality and environmental management system was not implemented during the study.

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Appendices

Appendix 1. Structure comparison between ISO 9001 and ISO 14001

(Tricker, 2017. pp. 91-94)

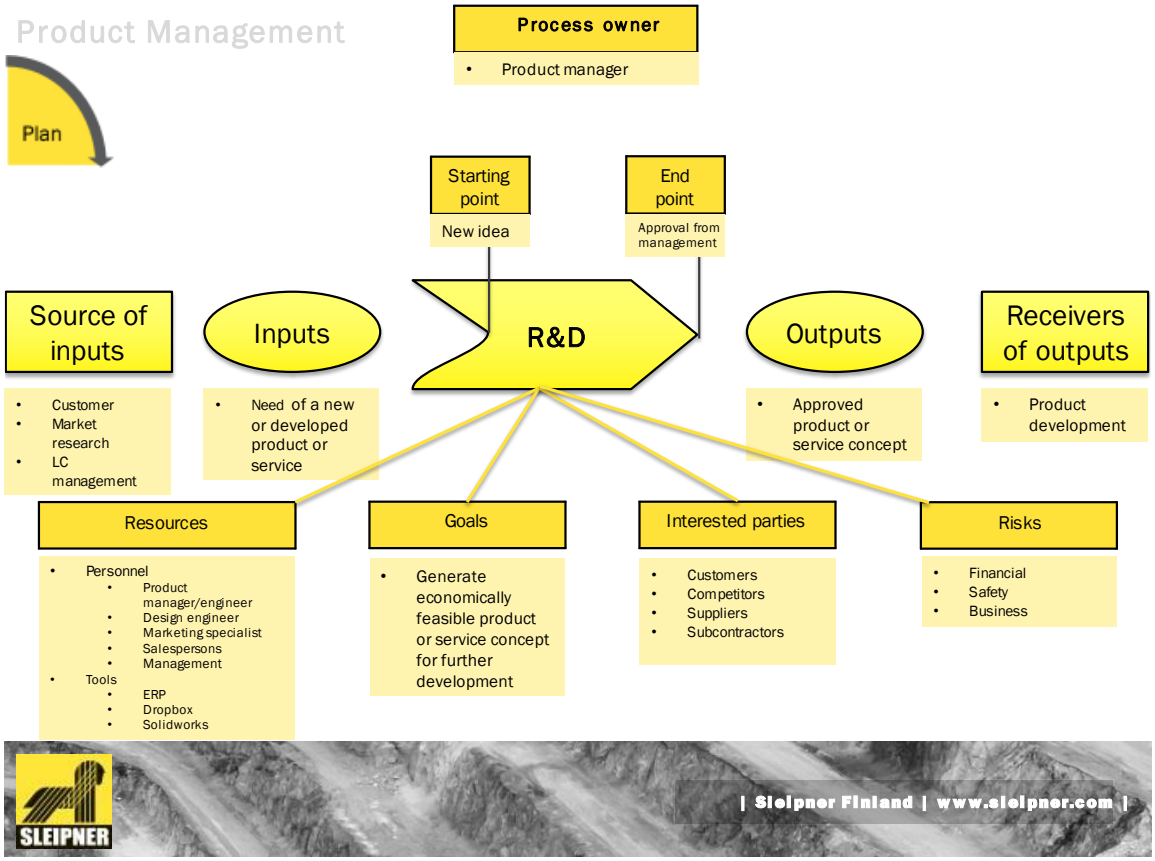
ISO 9001:2015	ISO 14001:2015
4. Context	**4.** Context
4.1 Understanding the organisation and its context	**4.1** Understanding the organisation and its context
4.2 Understanding the needs and expectations of interested parties	**4.2** Understanding the needs and expectations of interested parties
4.3 Determining the scope of the QMS	**4.3** Determining the scope of the EMS
4.4 QMS and its processes	**4.4** EMS
5. Leadership	**5.** Leadership
5.2 Policy	**5.2** Environmental policy
5.3 Organisational roles, responsibilities and authorities	**5.3** Organisational roles, responsibilities and authorities
6. Planning	**6.** Planning
6.1 Actions to address risk and opportunities	**6.1** Actions to address risk and opportunities
6.2 Quality objectives and planning to achieve them	**6.2** Environmental objectives and planning to achieve them
7. Support	**7.** Support
7.1 Resources	**7.1** Resources
7.2 Competence	**7.2** Competence
7.3 Awareness	**7.3** Awareness
7.4 Communication	**7.4** Communication
7.5 Documented information	**7.5** Documented information
7.5.1 General	**7.5.1** General
7.5.2 Creating and updating	**7.5.2** Creating and updating
7.5.3 Control of documented information	**7.5.3** Control of documented information
8. Operations	**8**. Operations
8.1 Operatinal planning and control	**8.1** Operatinal planning and control
	8.2 Emergency preparedness and response
9. Performance evaluation	**9.** Evaluation
9.1 Monitoring, meausurement, analysis and evaluation	**9.1** Monitoring, meausurement, analysis and evaluation
9.1.1 General	**9.1.1** General
9.1.3 Analysis and evaluation	**9.1.2** Evaluation and compliance
9.2 Internal audit	**9.2** Internal audit
9.3 Management review	**9.3** Management review
10. Improvoment	**10.** Improvoment
10.1 Nonconformity and corrective action	**10.1** Nonconformity and corrective action
10.2 Continual improvement	**10.2** Continual improvement

Appendix 2. Eleven questions

(Pesonen, 2007. pp 145-147)

1.What is the purpose of the process? Why does it exist?	
2. What is the first step in the process? What about the last one?	
3. What is input and what is output?	
4. Who are the customers of the process?	
5. What are the expectations and requirements of different customer groups?	
6. What are the success factors of the process?	
7. What are the resources needed for the process?	
8. Who is responsible from the process, ie the process owner?	
9. What are the process metrics?	
10. How is the process measured?	
11. How to improve the process?	

Appendix 3. Organizations processes



R&D ACTIVITIES

- Meeting every quartal between sales, engineering, production, marketing and management. Timing and tasks in ODOO
  - New ideas→ Open project in ODOO → create tasks to continue
  - Customer requirements and needs
  - Competitor analysis
- Cost and sales price analysis
- IPR review
- Product strategy
- Risk evaluation
- Product proposal for management review

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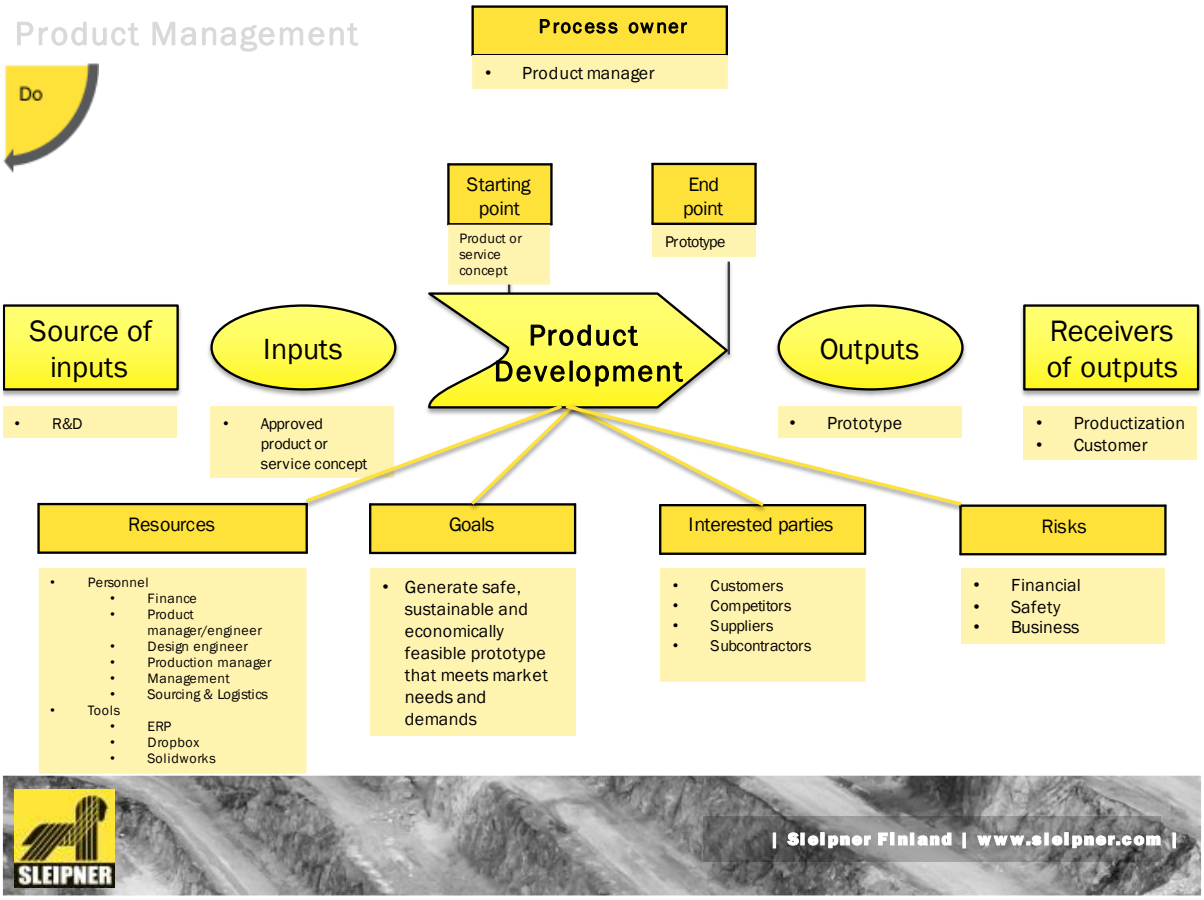
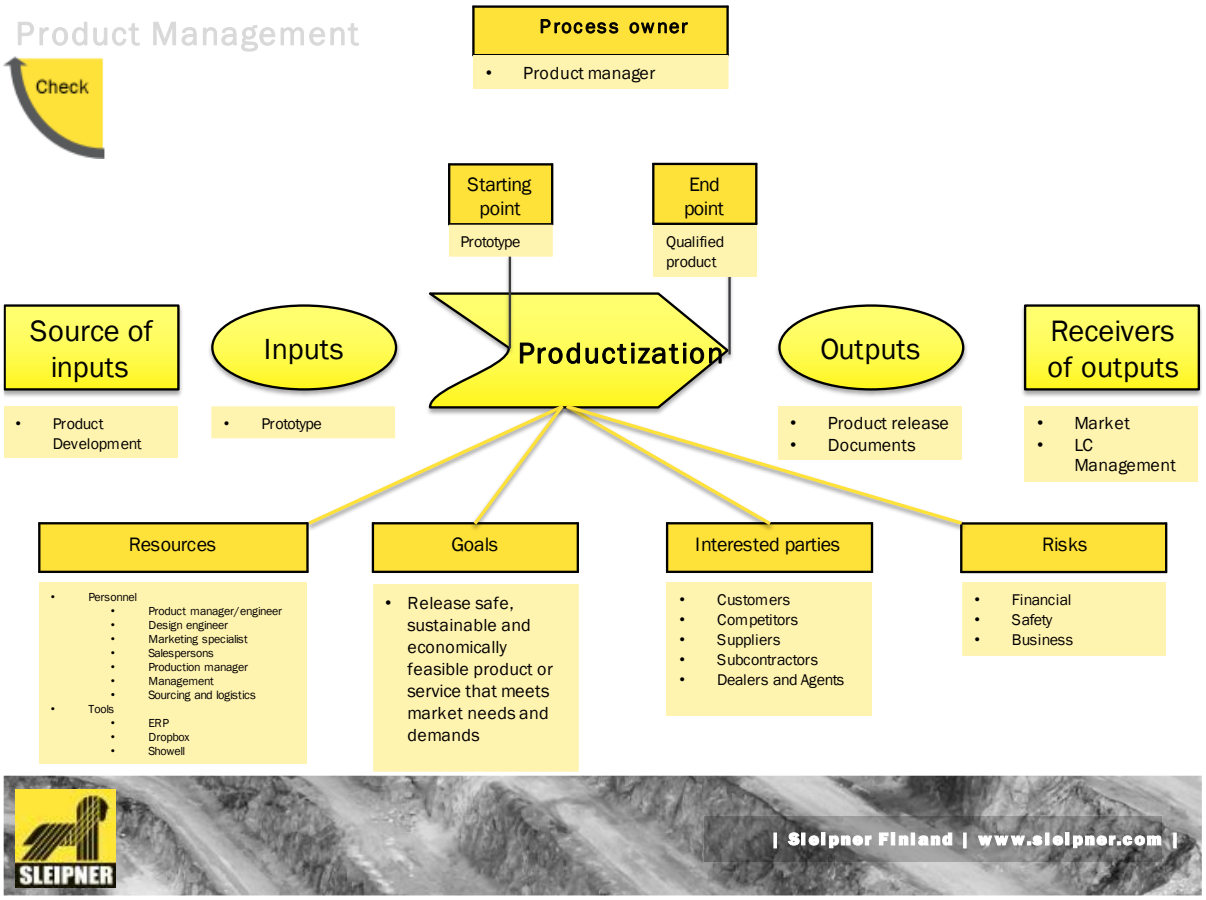


PRODUCT DEVELOPMENT ACTIVITIES

- Tasks to be created and completed in ODOO
- Project costs
- Product specification
- Manufacturing and sourcing plan
- Total cost of production
- Bill of material
- Risk evaluation
- Management approval to start building prototype
- MO for prototype



PRODUCTIZATION ACTIVITIES

- Tasks to be created and completed in ODOO
- Check actual production costs, found from ODOO
- Safety, technical and management qualification
- Product documentation
  - BOM, spare part list, maintenance manual, operating manual, safety manual and risks assessment
- Product training
- Marketing material content
- Product release checklist

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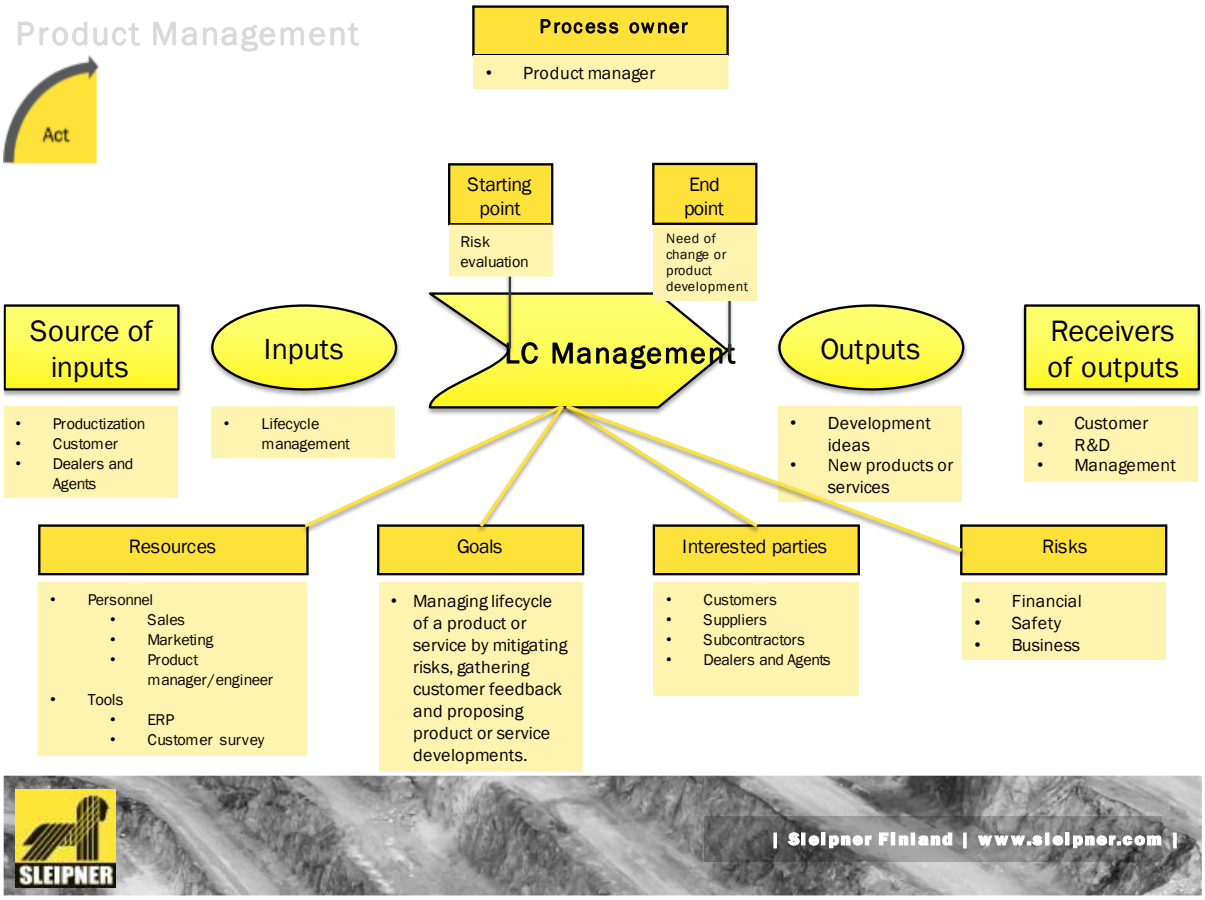

LC MANAGEMENT ACTIVITIES

- Risk evaluation
- Customer follow up and support
- Product follow up and monitoring
  - Spare part sales, data from DB -series
- Estimation of lifecycle costs
  - Data gathered from ODOO
- Proposal to change or develop products or service
- Loop starts again from R&D step

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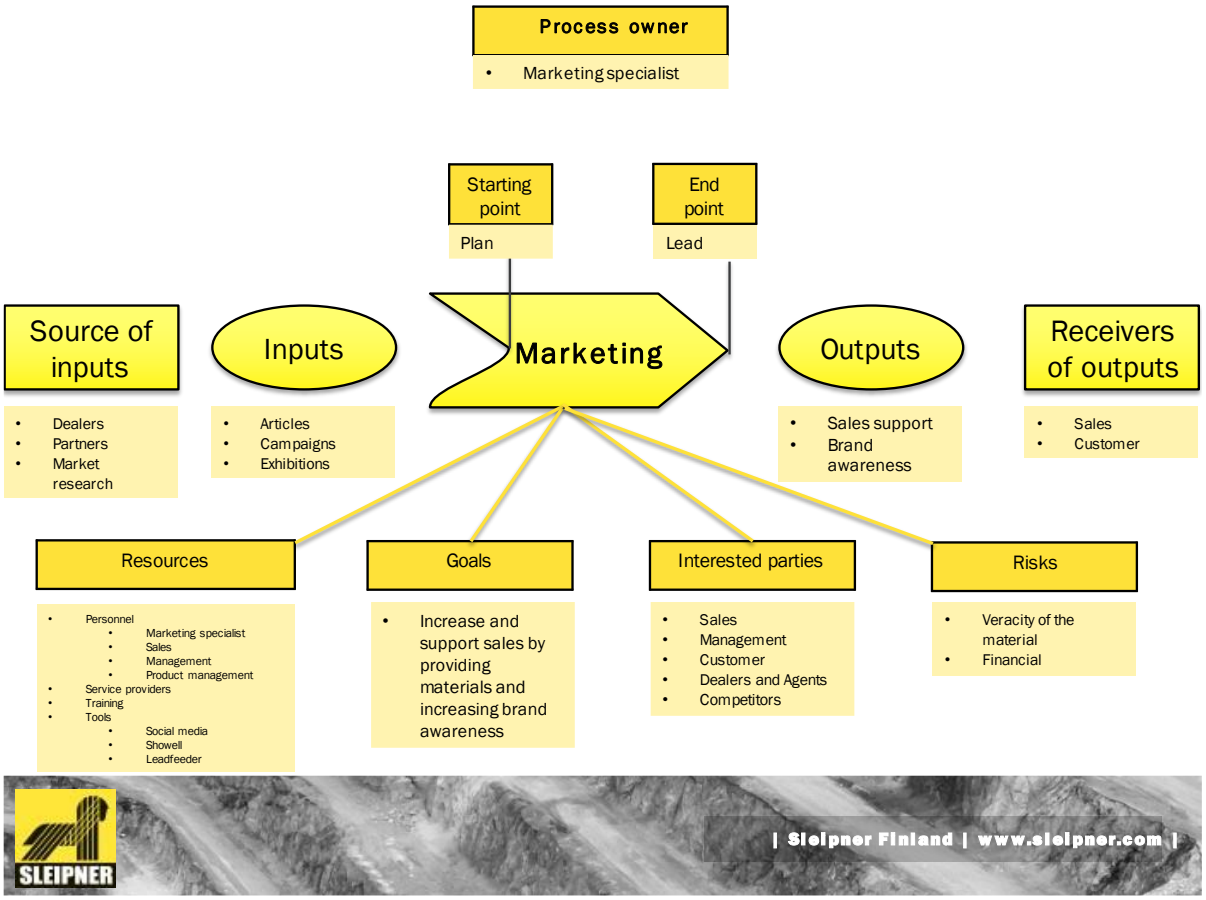
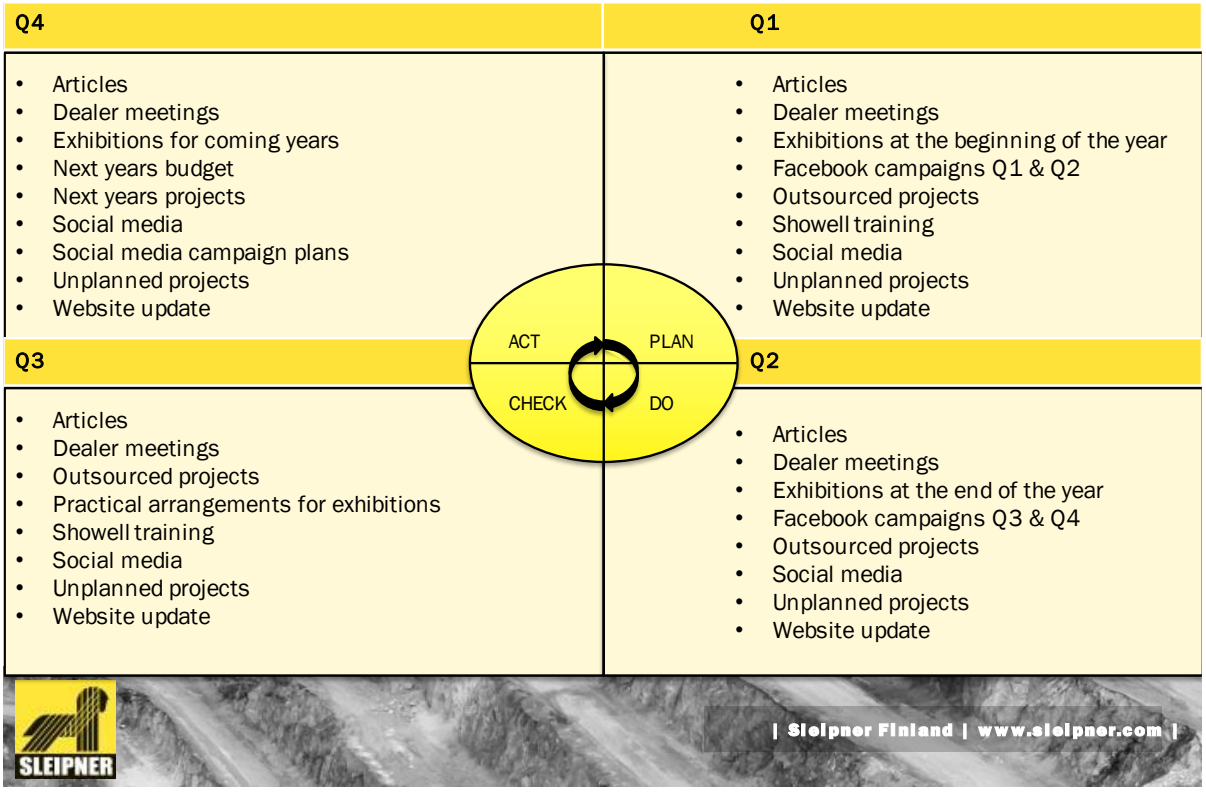
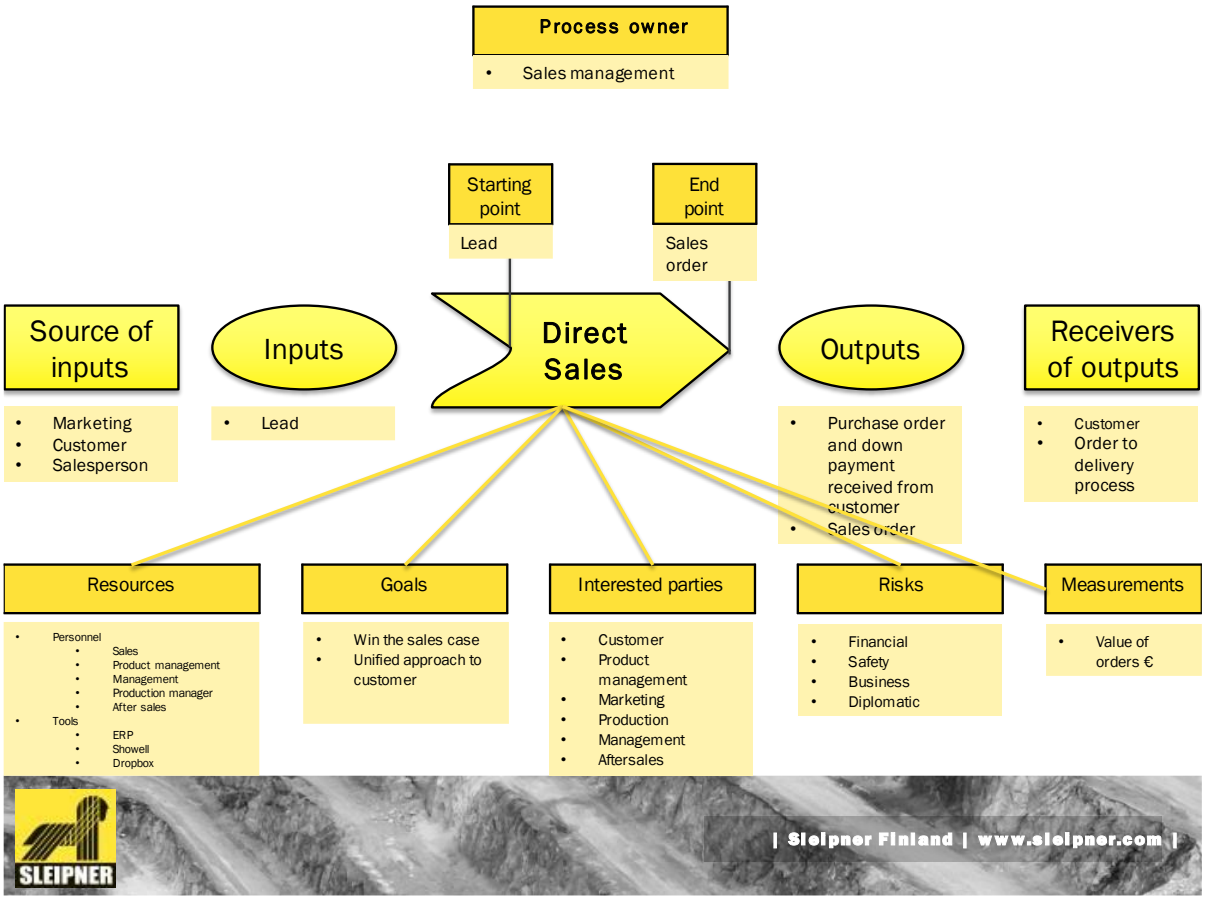


ANNUAL PLANNING CYCLE- MARKETING




Process owner
• Sales management
Starting point
Lead
End point
Sales order
Source of inputs
• Marketing
• Customer
• Salesperson
Inputs
• Lead
Direct Sales
Outputs
• Purchase order and down payment received from customer
• Sales order
Receivers of outputs
• Customer
• Order to delivery process
Resources
• Personnel
  • Sales
  • Product management
  • Management
  • Production manager
  • After sales
• Tools
  • ERP
  • Showell
  • Dropbox
Goals
• Win the sales case
• Unified approach to customer
Interested parties
• Customer
• Product management
• Marketing
• Production
• Management
• Aftersales
Risks
• Financial
• Safety
• Business
• Diplomatic
Measurements
• Value of orders €
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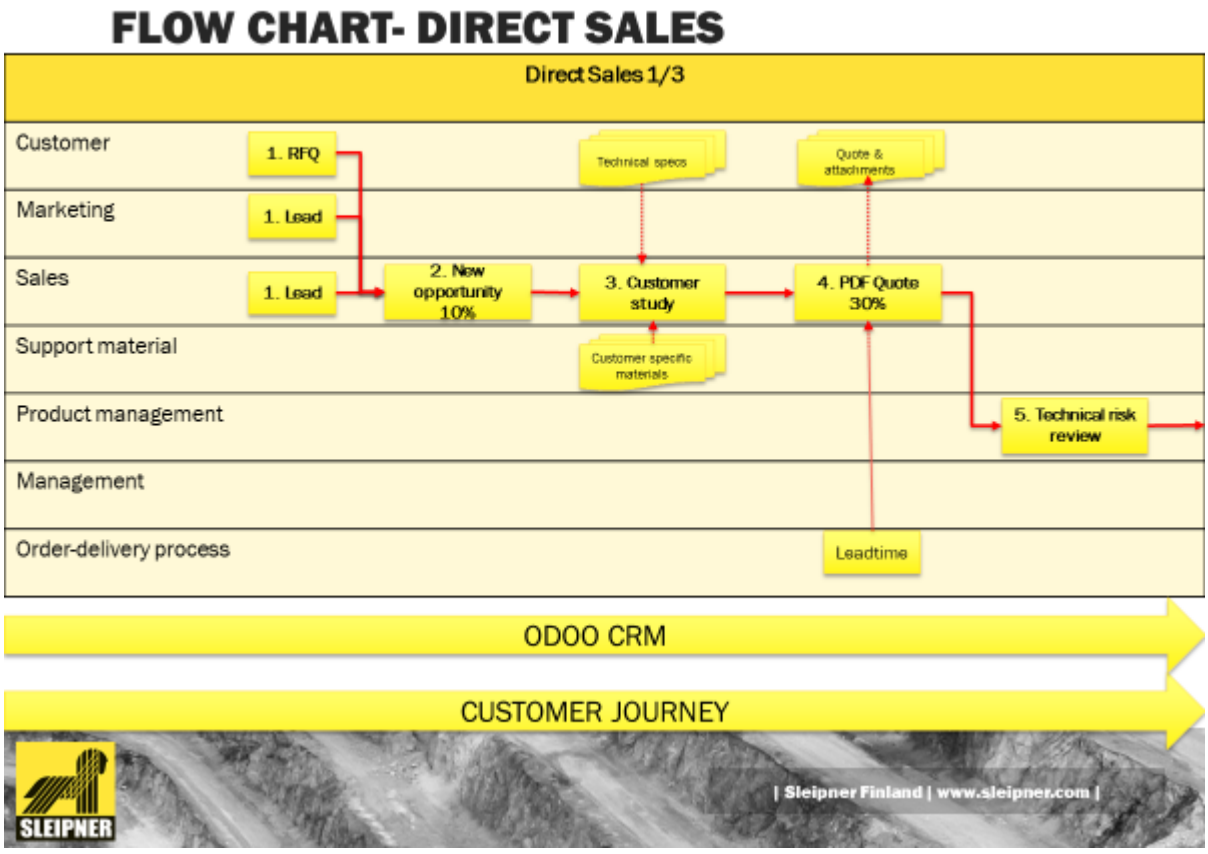
FLOW CHART- DIRECT SALES
Direct Sales 1/3
Customer
Marketing
Sales
Support material
Product management
Management
Order-delivery process
1. RFQ
1. Lead
1. Lead
2. New opportunity 10%
Technical specs
3. Customer study
Customer specific materials
Quote & attachments
4. PDF Quote 30%
5. Technical risk review
Leadtime
ODOO CRM
CUSTOMER JOURNEY
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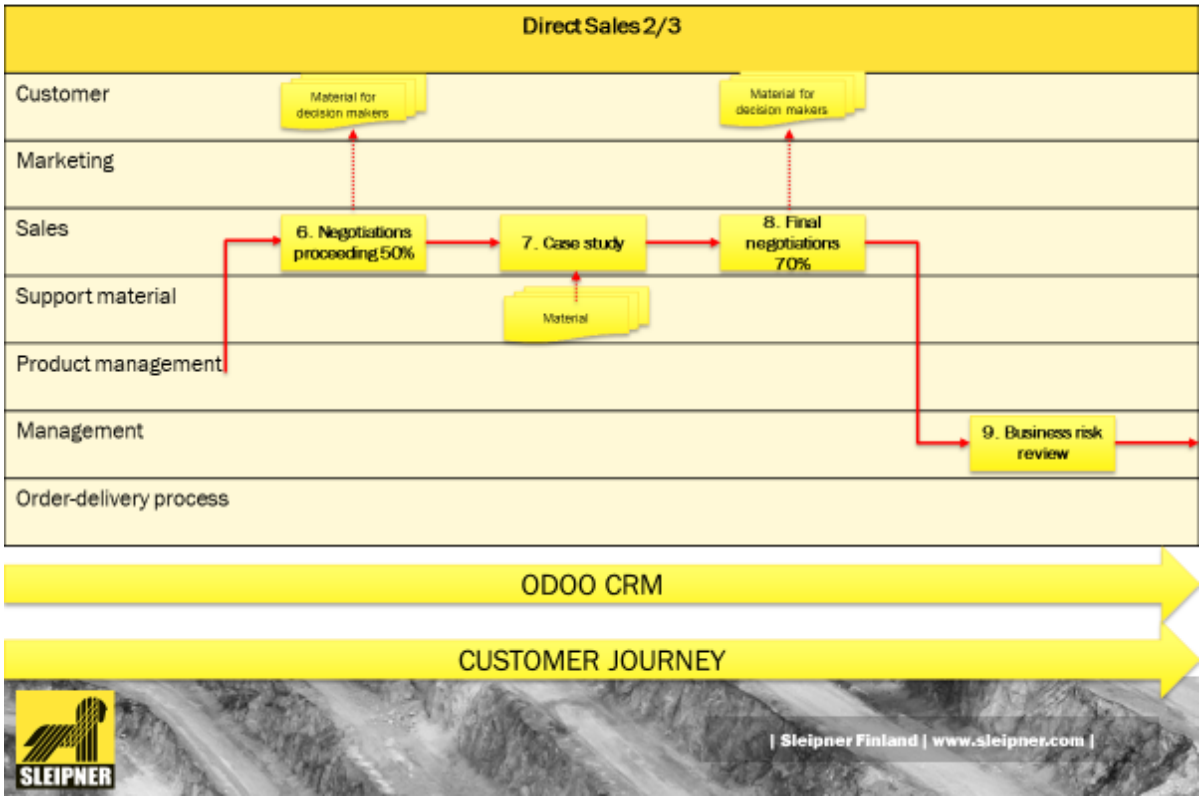
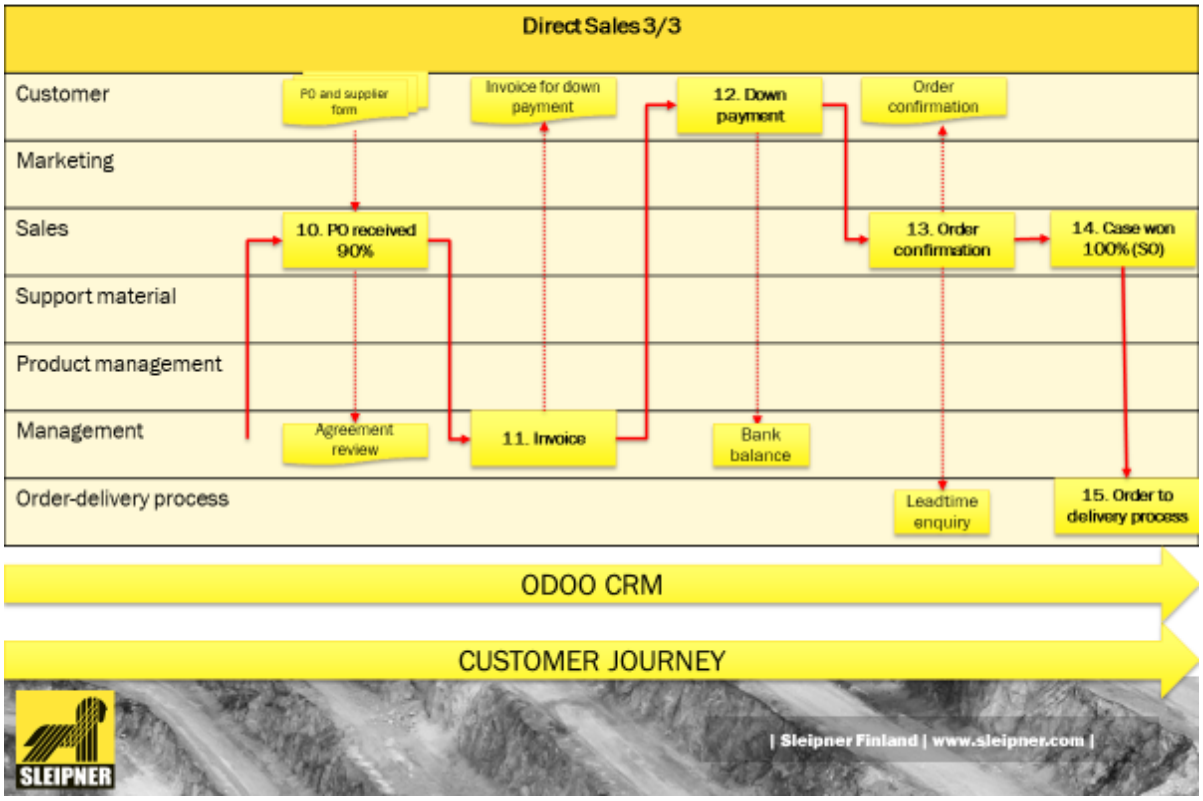
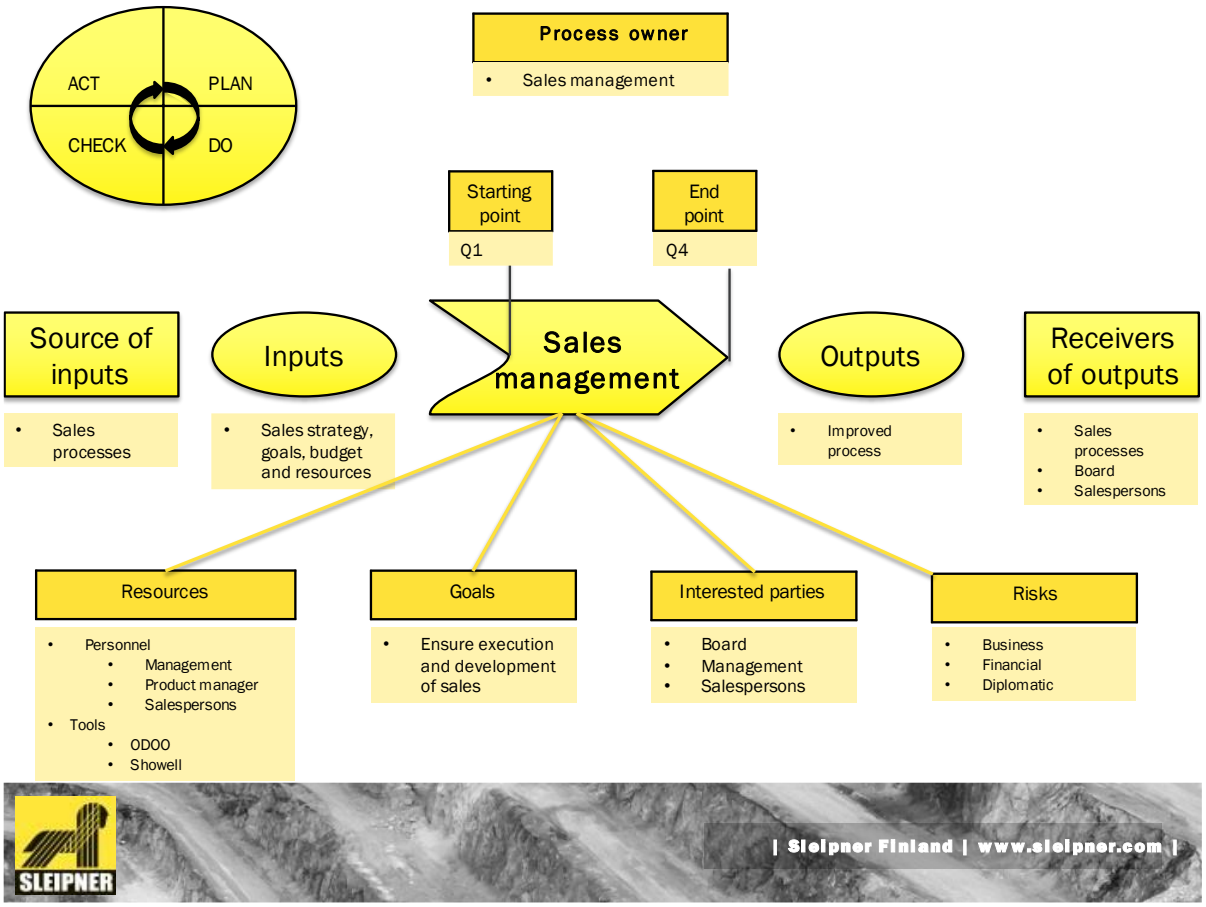
FLOW CHART- DIRECT SALES

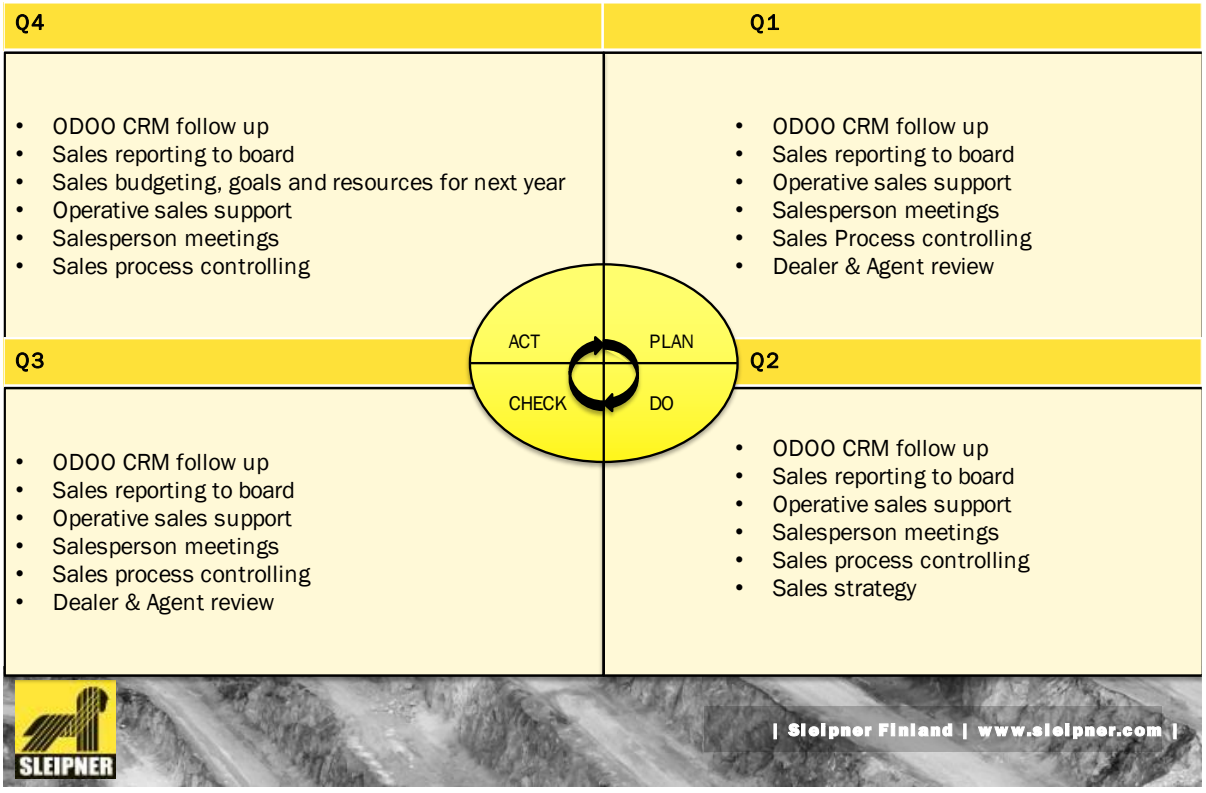


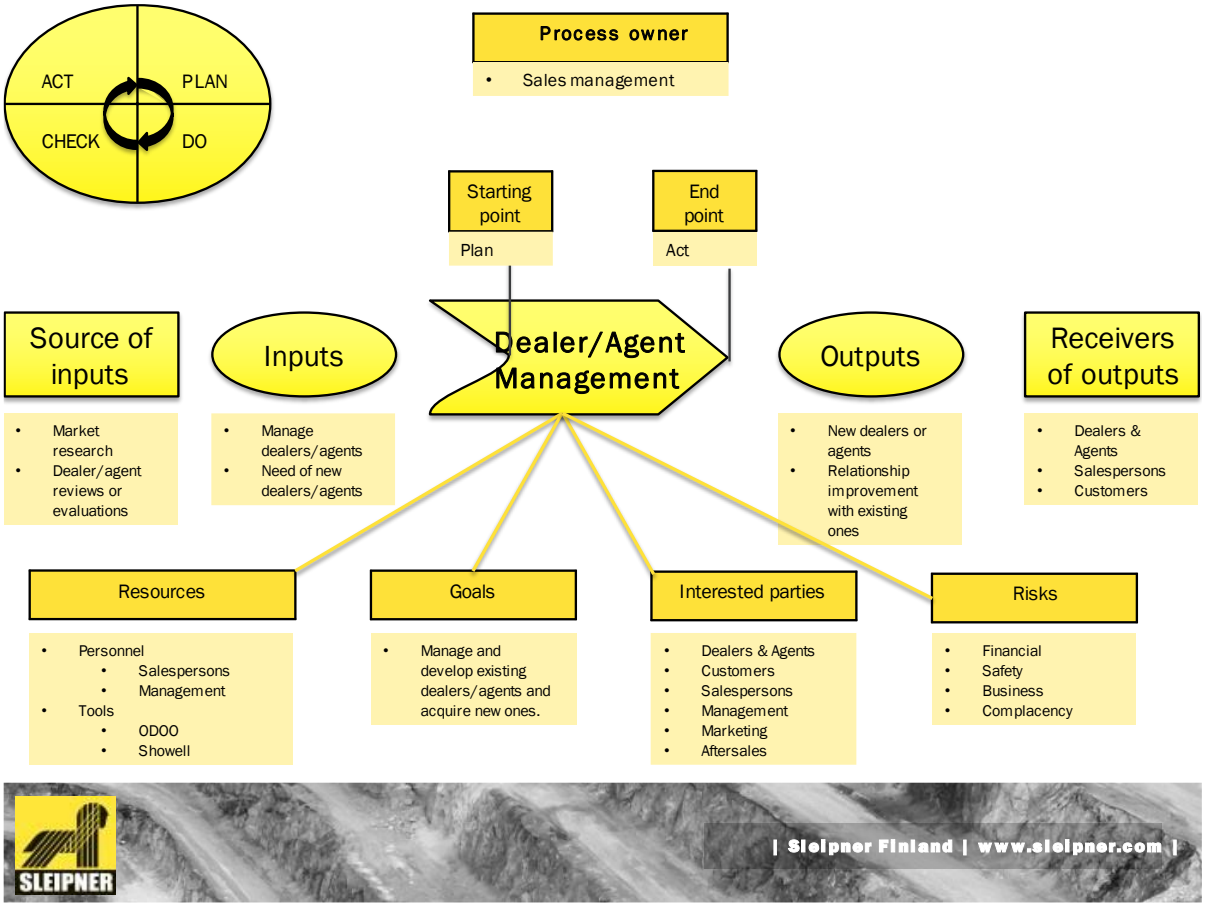
FLOW CHART- DIRECT SALES





ANNUAL PLANNING CYCLE-SALES MANAGEMENT





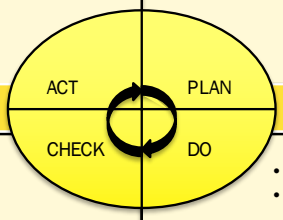
DEALER/AGENT MANAGEMENT

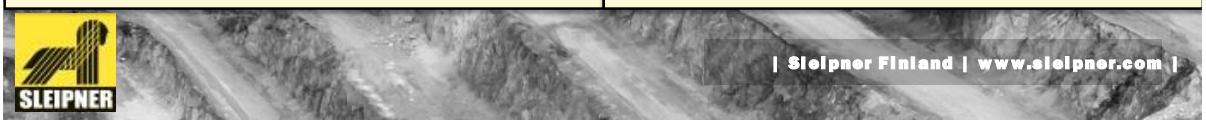
ACT	PLAN

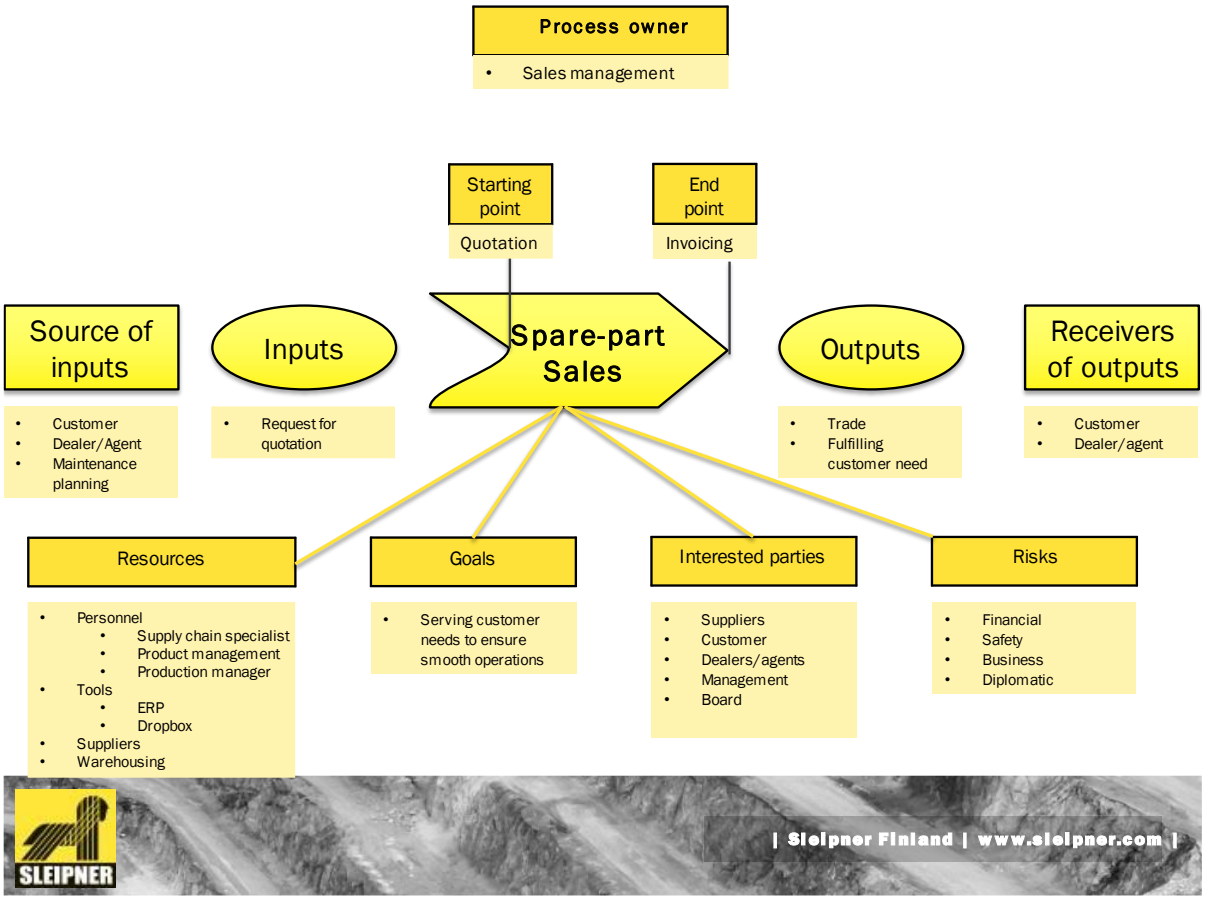
• New dealers/agents
  • Contract
  • Training
  • Sales & marketing strategy
  • Sales targets
  • Joint tour
• Existing dealers/agents
  • Contract termination/continues
	• New dealers/agents
	  • Identify areas where new ones are needed
	  • Sourcing strategy
	  • Qualifications
	• Existing dealers/agents
	  • Trainings
	  • Goals, sales strategy
	  • Support materials
	  • Support actions

CHECK	**DO**

• New dealers/agents
  • Audit
  • Business alignment
  • Safety alignment
  • Financial alignment agent dealer depending
  • Social compatibility
• Existing dealers/agents
  • Evaluation
  • Weekly or monthly reports
	• Networking
	• New dealers/agents
	  • Contacting
	  • Introduction to our business
	  • Dealers'/ agents business model
	  • Preliminary audit
	• Existing dealers/agents
	  • Meeting every quarter
	  • Operative support
	  • Customer visits






Process owner
Sales management
Starting point
Quotation
End point
Invoicing
Source of inputs
Customer
Dealer/Agent
Maintenance planning
Inputs
Request for quotation
Spare-part Sales
Outputs
Trade
Fulfilling customer need
Receivers of outputs
Customer
Dealer/agent
Resources
Personnel
Supply chain specialist
Product management
Production manager
Tools
ERP
Dropbox
Suppliers
Warehousing
Goals
Serving customer needs to ensure smooth operations
Interested parties
Suppliers
Customer
Dealers/agents
Management
Board
Risks
Financial
Safety
Business
Diplomatic
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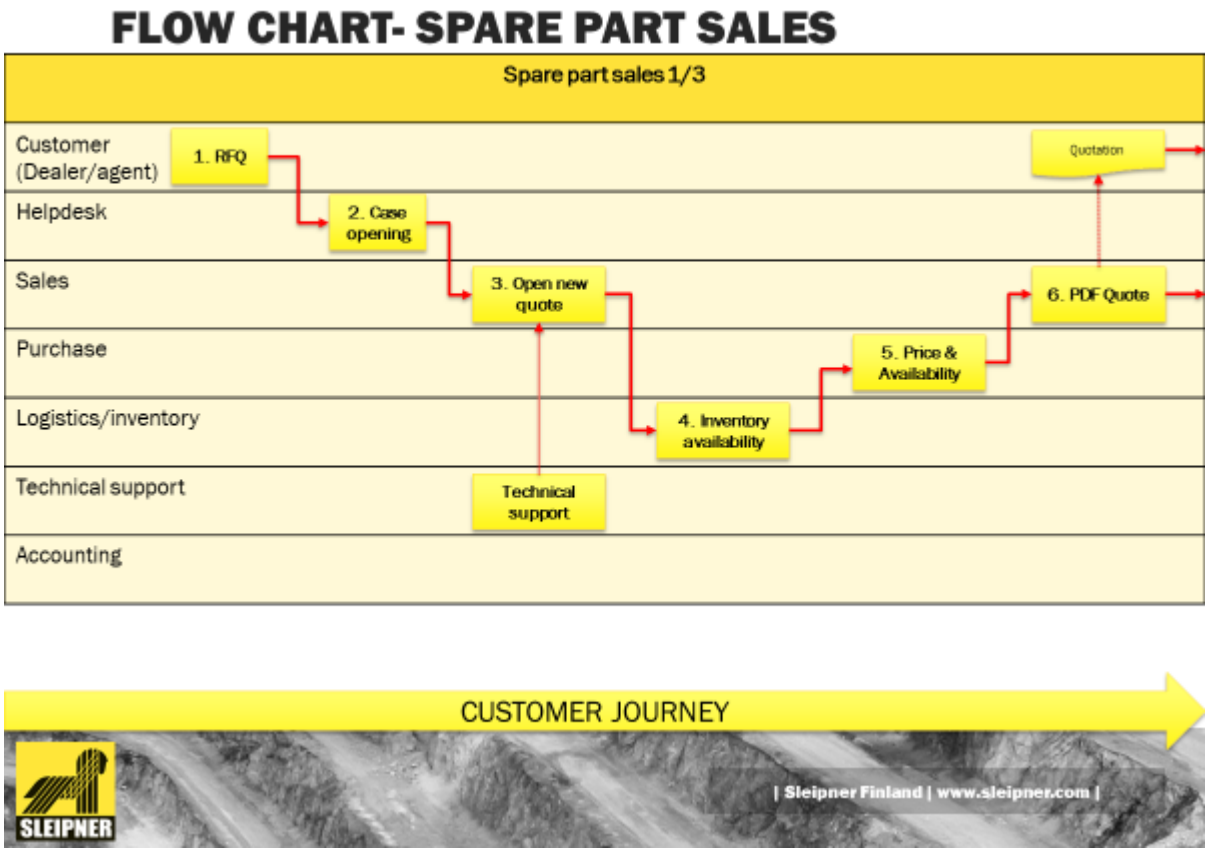
FLOW CHART- SPARE PART SALES
Spare part sales 1/3
Customer (Dealer/agent)
Helpdesk
Sales
Purchase
Logistics/inventory
Technical support
Accounting
1. RFQ
2. Case opening
3. Open new quote
4. Inventory availability
5. Price & Availability
6. PDF Quote
Quotation
Technical support
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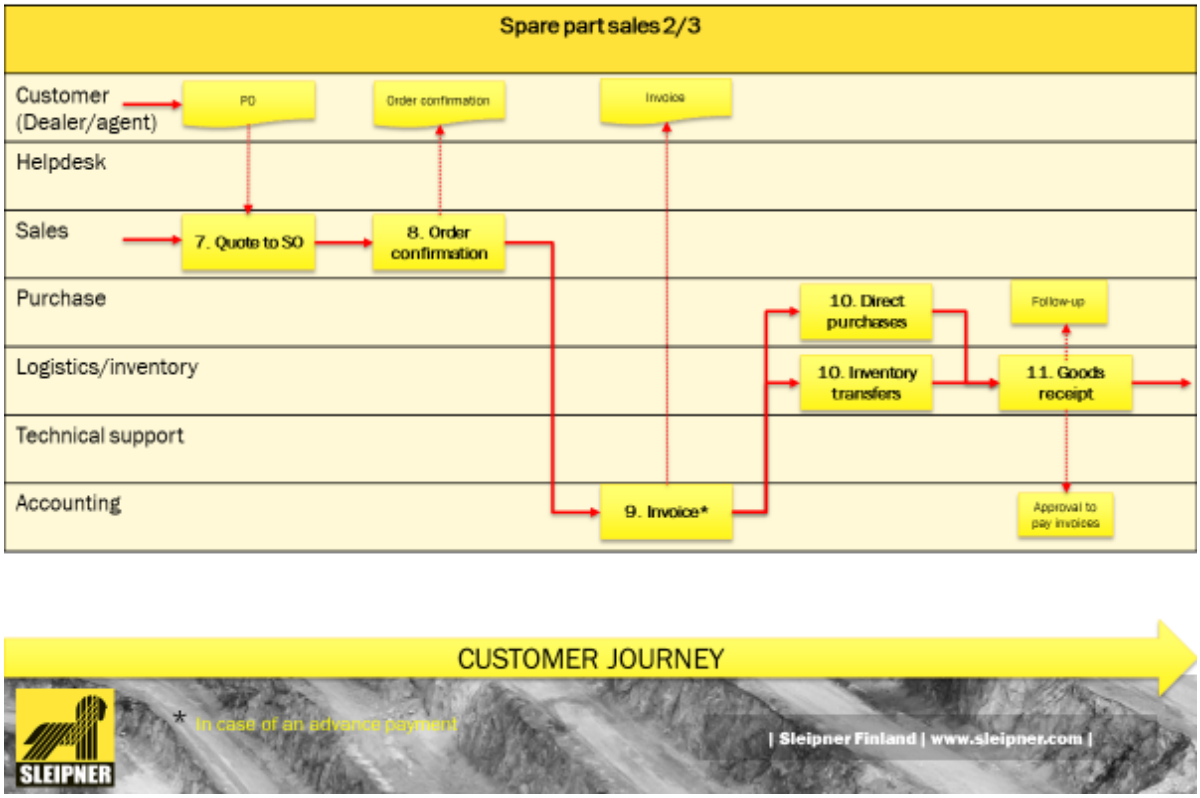
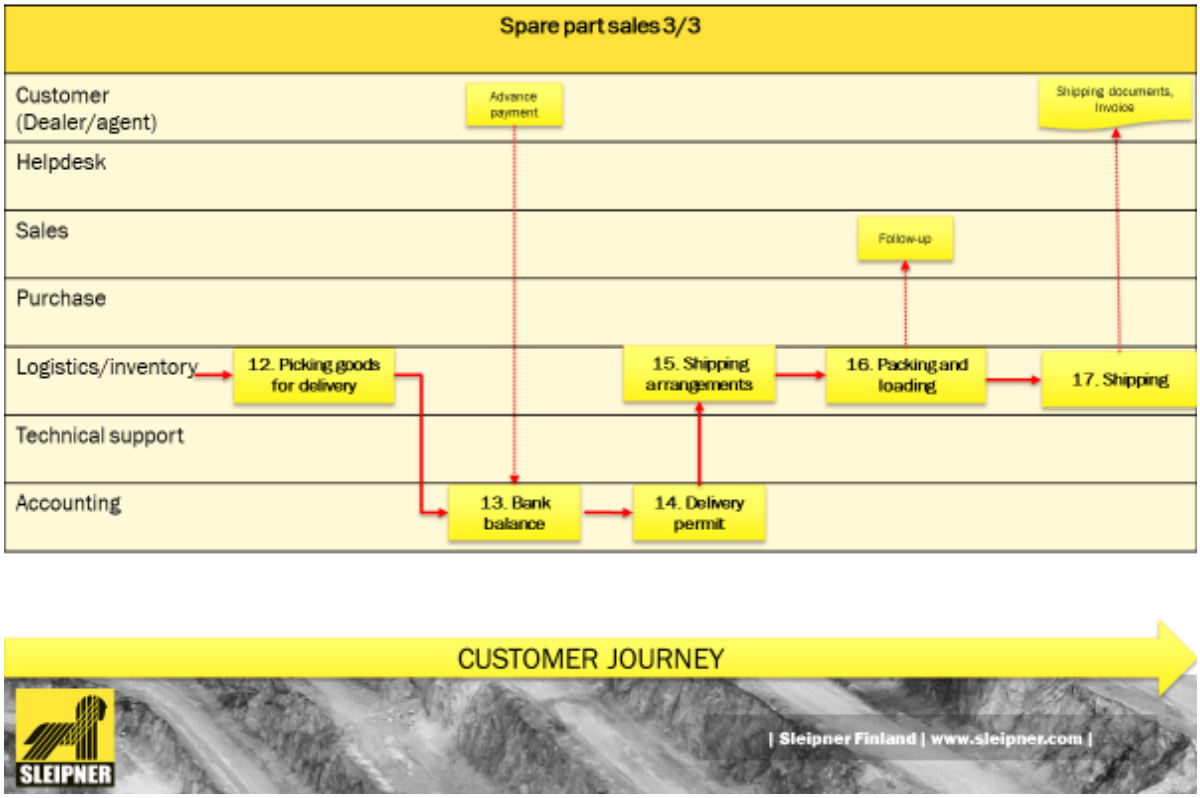
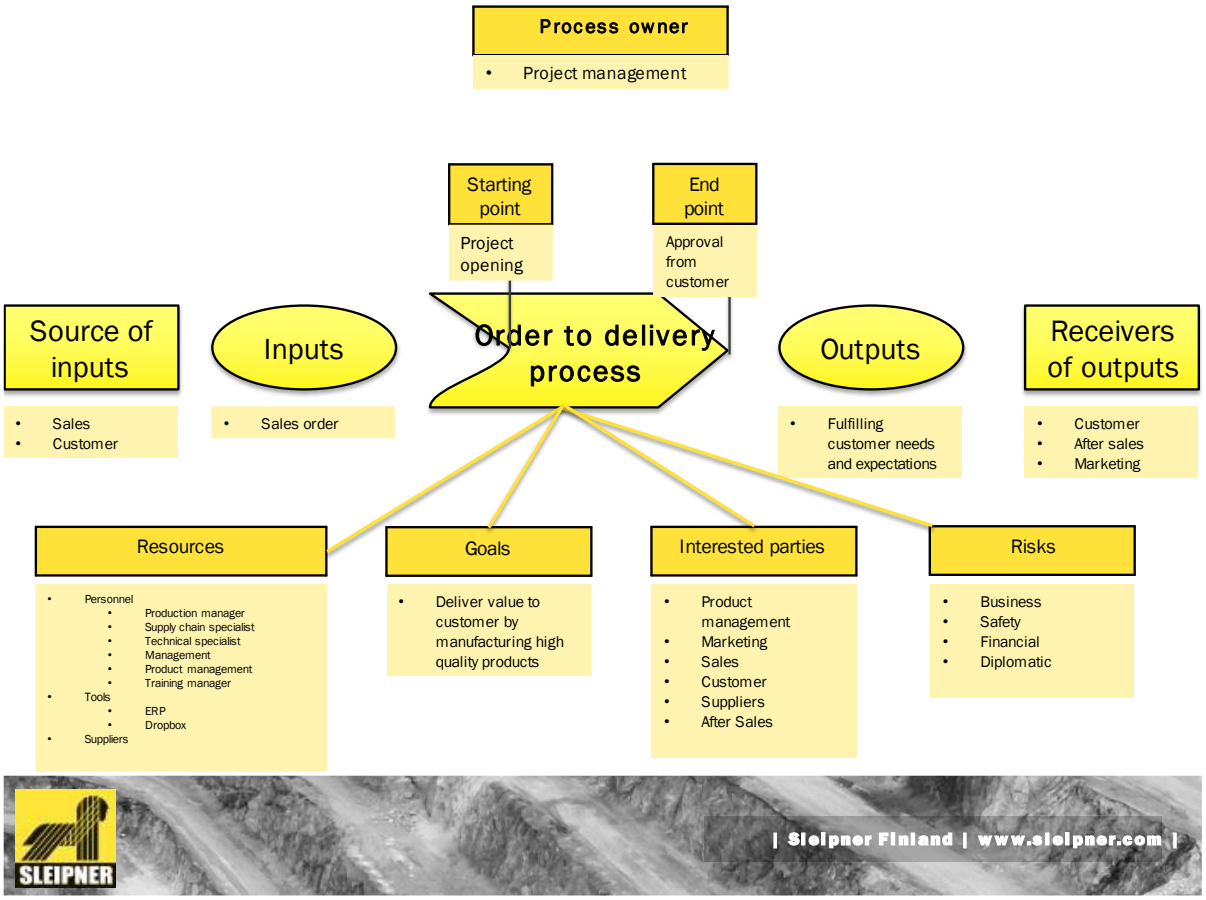
FLOW CHART- SPARE PART SALES



FLOW CHART- SPARE PART SALES




Process owner
Project management
Starting point
Project opening
End point
Approval from customer
Source of inputs
Sales
Customer
Inputs
Sales order
Order to delivery process
Outputs
Fulfilling customer needs and expectations
Receivers of outputs
Customer
After sales
Marketing
Resources
Personnel
Production manager
Supply chain specialist
Technical specialist
Management
Product management
Training manager
Tools
ERP
Dropbox
Suppliers
Goals
Deliver value to customer by manufacturing high quality products
Interested parties
Product management
Marketing
Sales
Customer
Suppliers
After Sales
Risks
Business
Safety
Financial
Diplomatic
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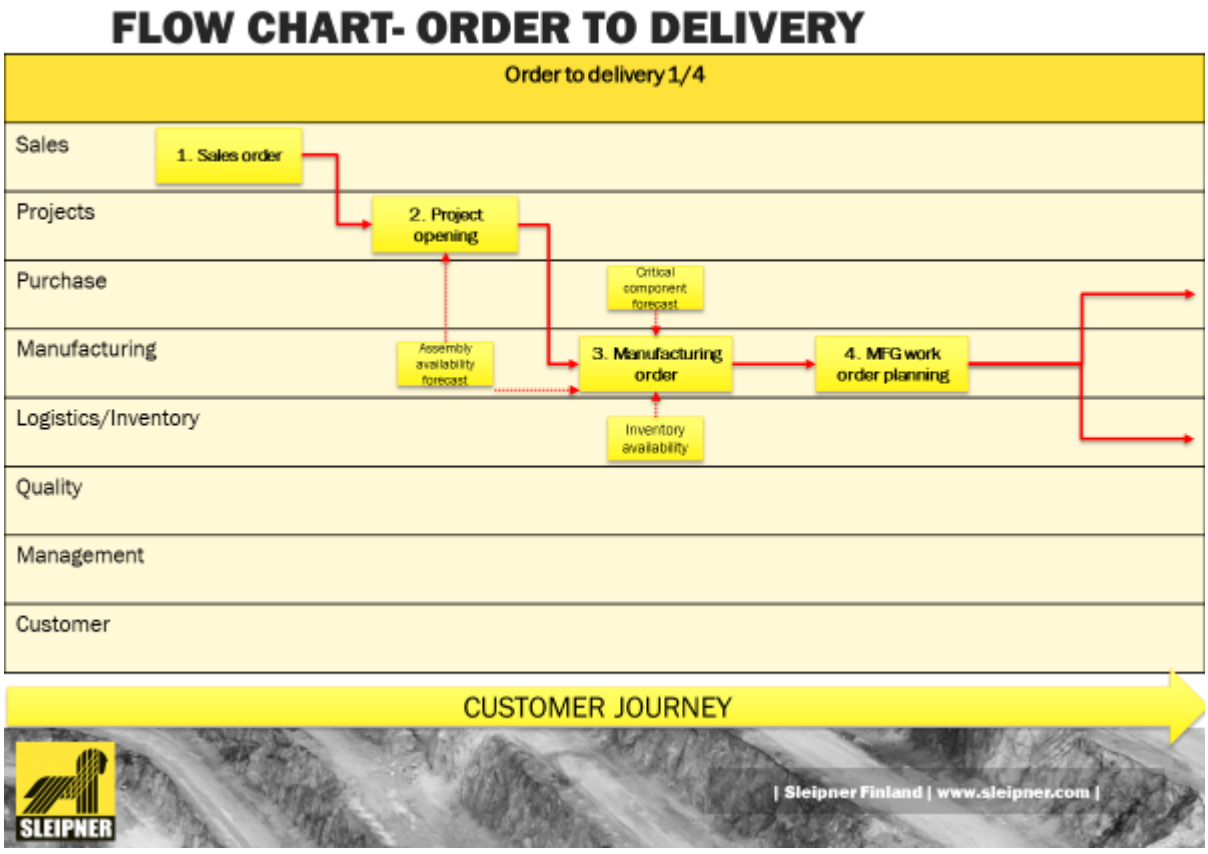
FLOW CHART- ORDER TO DELIVERY
Order to delivery 1/4
Sales
1. Sales order
Projects
2. Project opening
Purchase
Critical component forecast
Manufacturing
Assembly availability forecast
3. Manufacturing order
4. MFG work order planning
Logistics/Inventory
Inventory availability
Quality
Management
Customer
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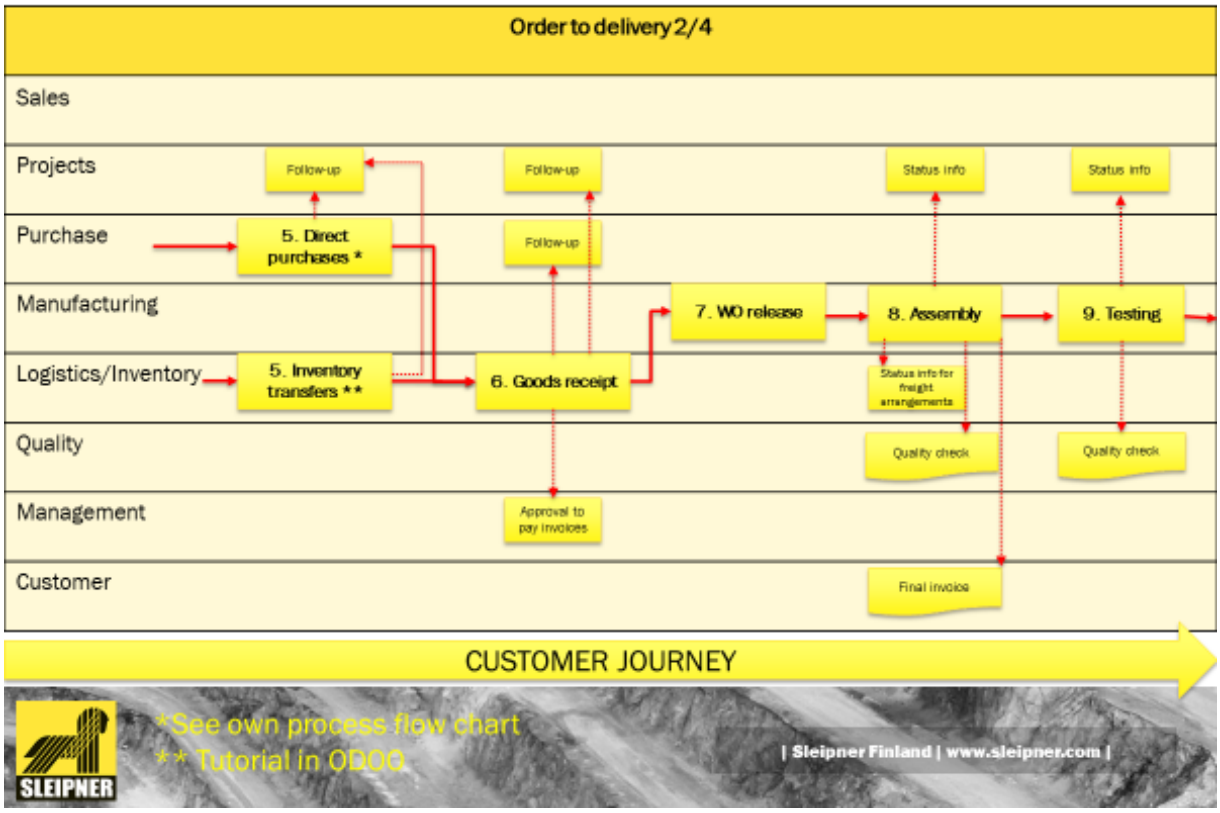
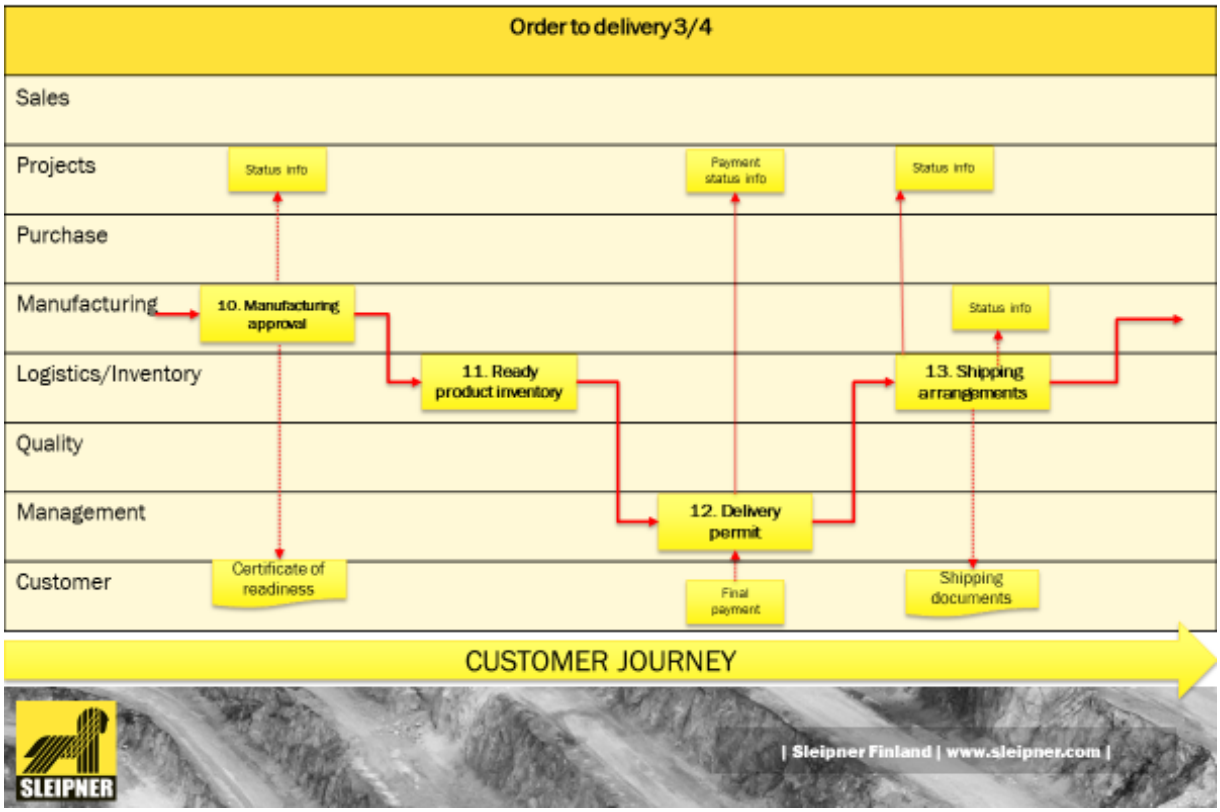
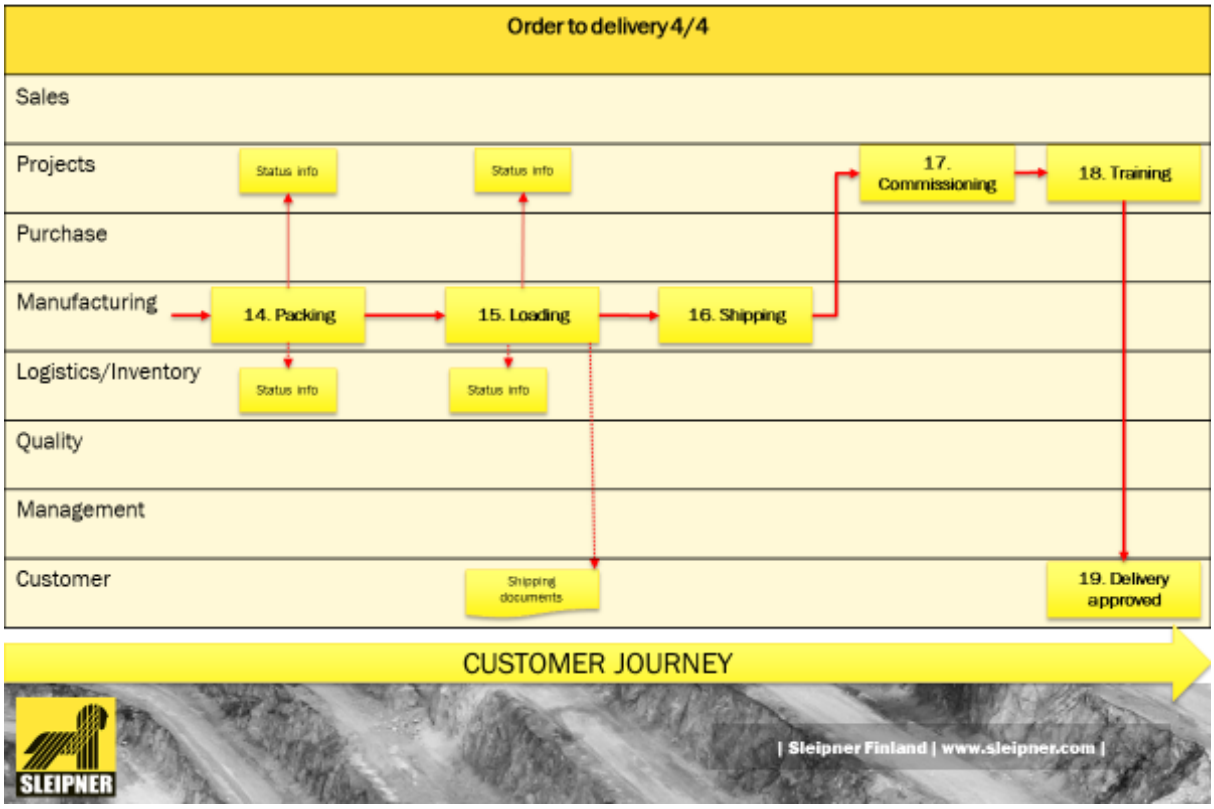
FLOW CHART- ORDER TO DELIVERY



FLOW CHART- ORDER TO DELIVERY

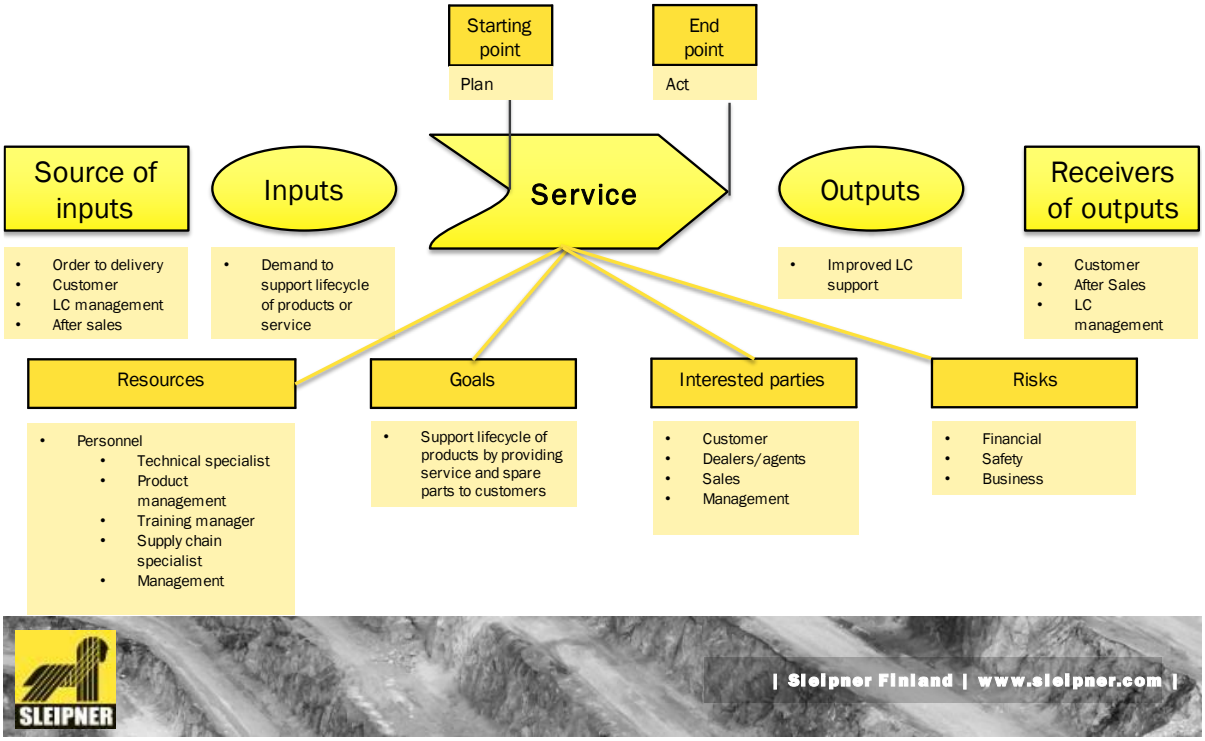


FLOW CHART- ORDER TO DELIVERY

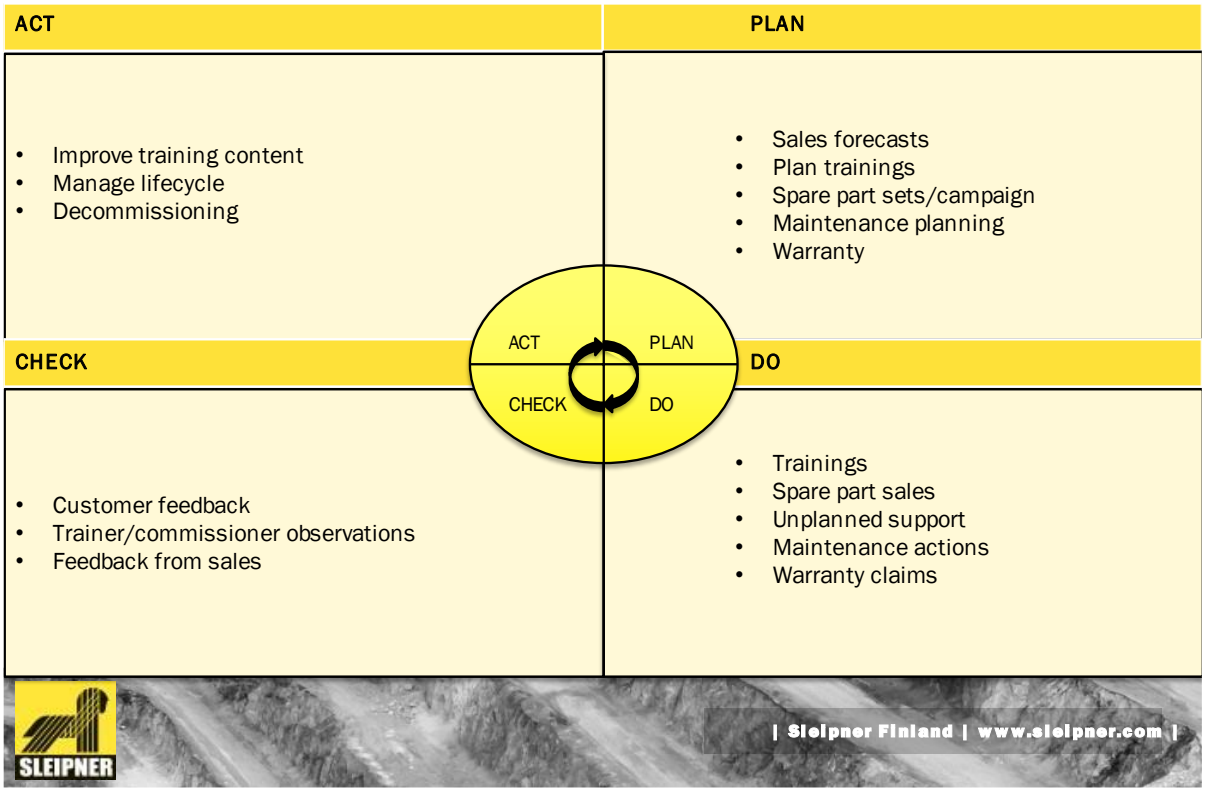


Process owner

- Service management



SERVICE


ACT
PLAN
• Improve training content
• Manage lifecycle
• Decommissioning
• Sales forecasts
• Plan trainings
• Spare part sets/campaign
• Maintenance planning
• Warranty
ACT
PLAN
CHECK
DO
CHECK
DO
• Customer feedback
• Trainer/commissioner observations
• Feedback from sales
• Trainings
• Spare part sales
• Unplanned support
• Maintenance actions
• Warranty claims
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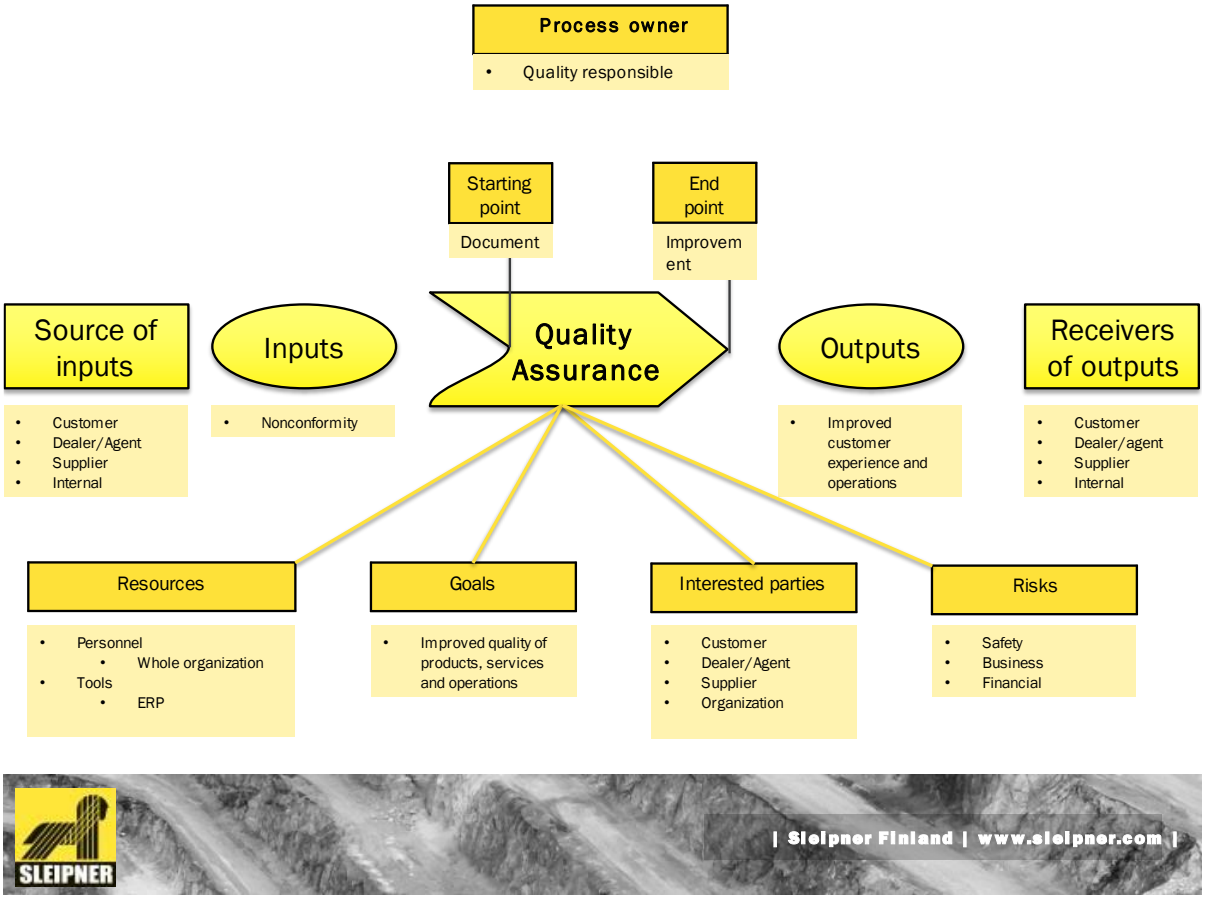
Process owner
• Quality responsible
Starting point
Document
End point
Improvement
Source of inputs
Inputs
Quality Assurance
Outputs
Receivers of outputs
• Customer
• Dealer/Agent
• Supplier
• Internal
• Nonconformity
• Improved customer experience and operations
• Customer
• Dealer/agent
• Supplier
• Internal
Resources
Goals
Interested parties
Risks
• Personnel
• Whole organization
• Tools
• ERP
• Improved quality of products, services and operations
• Customer
• Dealer/Agent
• Supplier
• Organization
• Safety
• Business
• Financial
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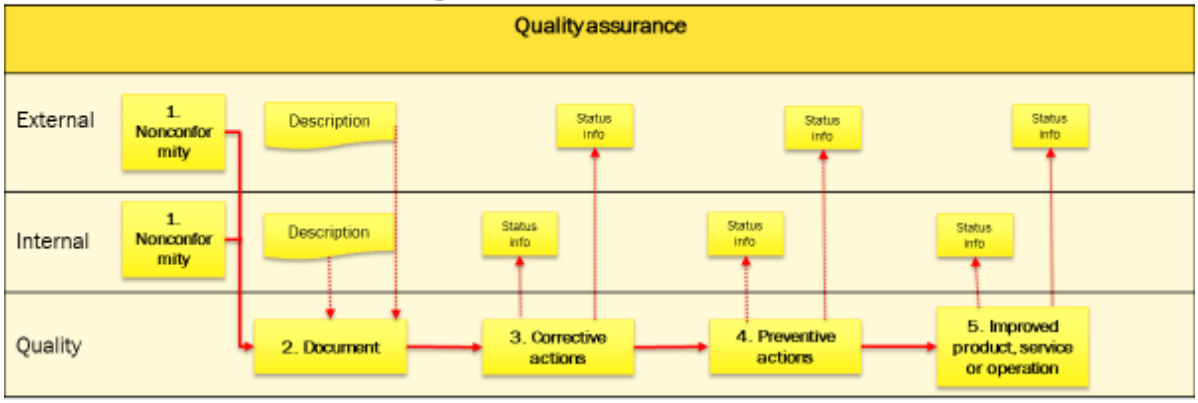
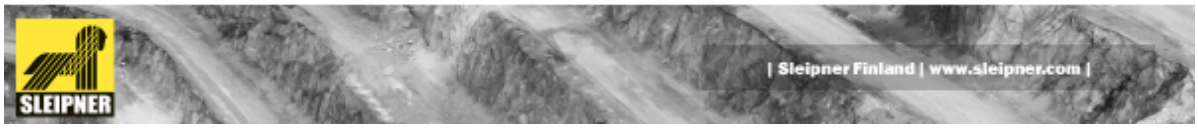
FLOW CHART- QUALITY ASSURANCE





Process owner

- Materials management

Starting point

Plan

End point

Act

Source of inputs

- Sales
- Aftersales
- Order to delivery
- Management
- LC management

Inputs

- Demand to support operations

Materials management

Outputs

- Improved and more efficient materials management

Receivers of outputs

- Aftersales
- Order to delivery
- Suppliers

Resources

- Personnel
  - Product management
  - Production manager
  - Supply chain specialist
  - Technical specialist
- Tools
  - ERP
  - Solidworks

Goals

- Plan and execute materials management efficiently to match the requirements of core processes

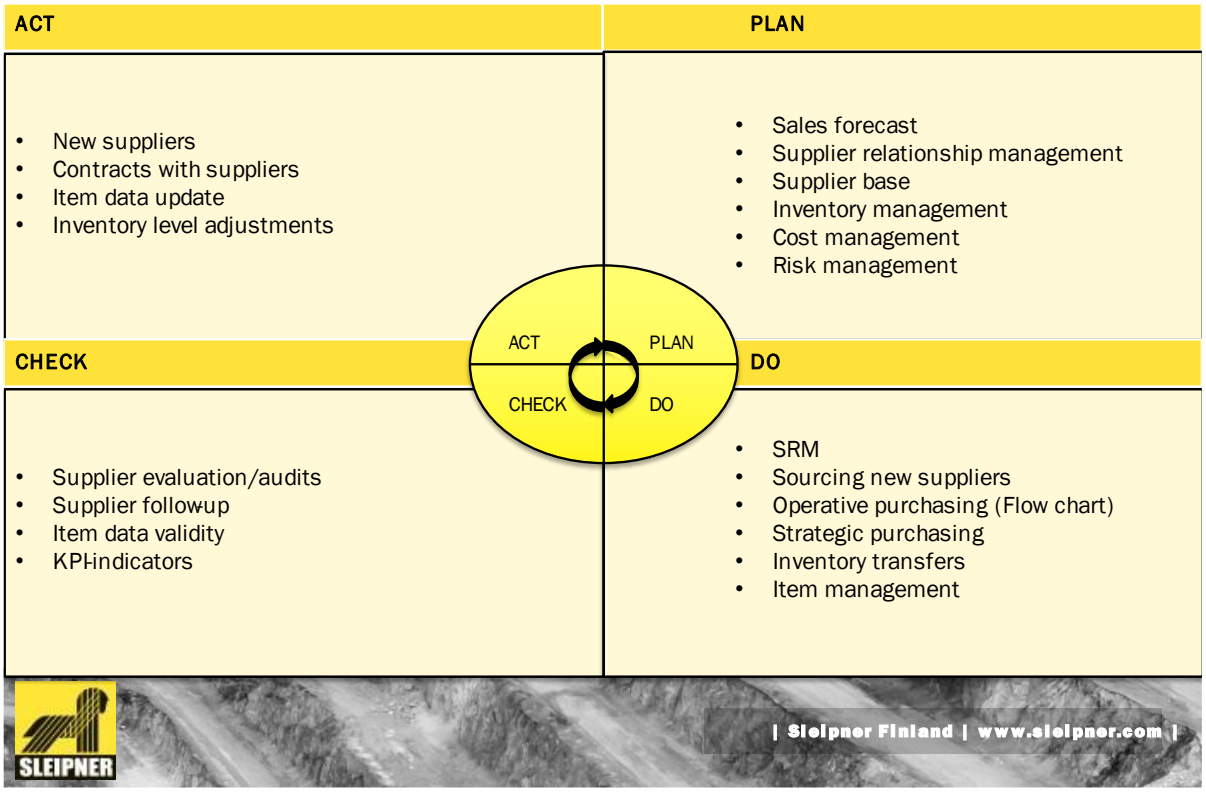
Interested parties

- Suppliers
- Dealers/agents
- Management
- Board

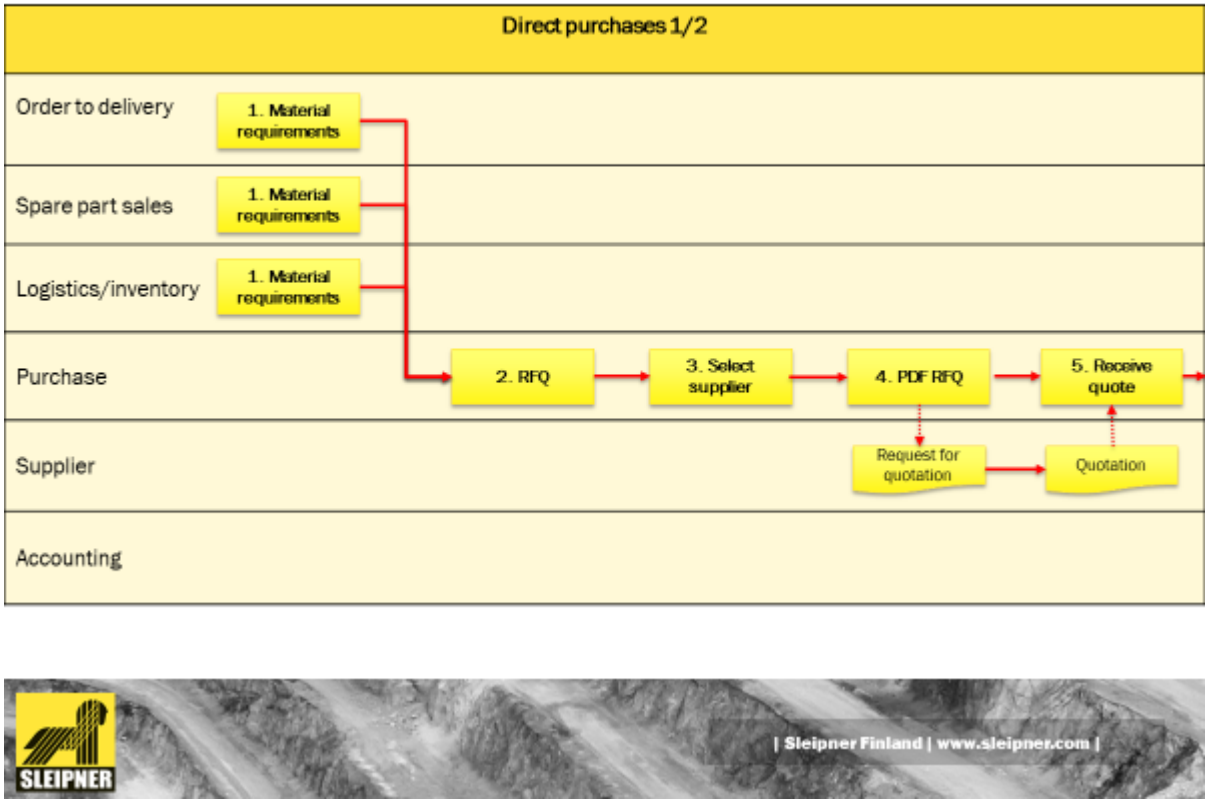
Risks

- Financial
- Safety
- Business

MATERIALS MANAGEMENT



FLOW CHART- DIRECT PURCHASES



FLOW CHART- DIRECT PURCHASES