

Bachelor thesis

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CHANGE MANAGEMENT IN GLOBAL ORDER MANAGEMENT

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ABSTRACT

Changes are a part of order management when designed, tailored and complicated products are manufactured. Change management procedures on the entire delivery chain affect dramatically the result of a delivery process. The subject of this bachelor's thesis is to reflect on change management literature and adapt it to the target company. The main target of the study is to clarify and standardize change management processes and practices in the Global Order Management department. As a result, the study presents process descriptions and instructions. The thesis is divided into three main sections: a literature analysis, an empirical analysis and the creation of the change management process. The implementation phase of the created change management system has been excluded from this thesis.

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TIIVISTELMÄ

Muutokset ovat aina osa tilaustenhallintaa valmistettaessa suunniteltuja, asiakkaalle räätälöityjä monimutkaisia tuotteita. Muutoksenhallintaprosessien toimivuus koko toimitusketjussa vaikuttaa oleellisesti toimitusprosessin lopputulokseen. Tämän lopputyön aiheena on muutoksenhallintateorioiden tarkastelu ja niiden soveltaminen kohdeyrityksen tilaushallintoon. Tutkintotyön päätavoitteena on selkeyttää ja yhtenäistää olemassa olevat muutoksenhallintaprosessit sekä käytännöt. Tutkintotyön lopputuloksena syntyy muutoksenhallintaan tarvittavat prosessikuvaukset sekä ohjeistukset. Tutkintotyö on jaettu kolmeen pääosiin: Ensimmäisessä osiossa käydään läpi muutoksenhallintaa tunnettujen teorioiden pohjalta, toisessa osiossa tutkitaan kohdeyritystä empiirisenä tutkimuksena ja kolmannessa osiossa esitellään kehitetyt muutoksenhallintaprosessit sekä ohjeistukset. Suunnitellun muutoksenhallintajärjestelmän implementointi on poissuljettu tästä lopputyöstä.

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1 INTRODUCTION

1.1 Background of the thesis

This bachelor thesis continues master thesis Change management in delivery projects, written by Lotta Haakana. The purpose of her master thesis was study how changes should be managed, which changes in component delivery projects should be managed, and how changes are managed at the moment. /3, p.1-2/ After her master thesis, a need for practical change management process was still current, and thus this bachelor thesis concentrates to develop the change management process for the Global Order Management department.

1.2 Objectives and scope

This thesis is done for the Global order management (GOM) department at Konecranes Heavy Lifting. The GOM department manages component deliveries for the internal customers. At the moment the GOM department does not have a formal change management procedure and all changes are implemented in various methods.

The main objective of thesis is to create a formal change management procedure for the GOM department. The purpose is to find out standard change management procedures, create instructions, and tools for the change tracking. The change management process will be based on the literature and empirical study. Finding out the reasons and sources of the changes is not the main purpose of the thesis. The change request process is excluded as it is an independent process and it is performed before the change management process.

1.3 Definitions and abbreviations

Change: Change is any deviation from the original order.

ComActivity: ERP-system in Global order management

ERP: Enterprise resource planning

GOM: Global Order Management in Hyvinkää, Finland. Handles component orders from internal customers.

GOM order form: Component order form

iLM: ERP-system of Konecranes component factories

KHC: Component factory of Konecranes Heavy Lifting.

PDM: Product data management system for handling product information and drawings.

1.4 The structure of the thesis

This thesis has been divided in six chapters: introduction, four main areas and conclusions. The first chapter is introducing the background and the scope of thesis. The four main chapters consist of Change management in order processing, Changes in Global Order Management, Order change management in Global Order Management and Measuring the changes in Global Order Management. The first main chapter is a pure literature analysis and three remaining chapters consist of empirical study and analysis of constructed change management process. In the last chapter results are discussed and comments are given.

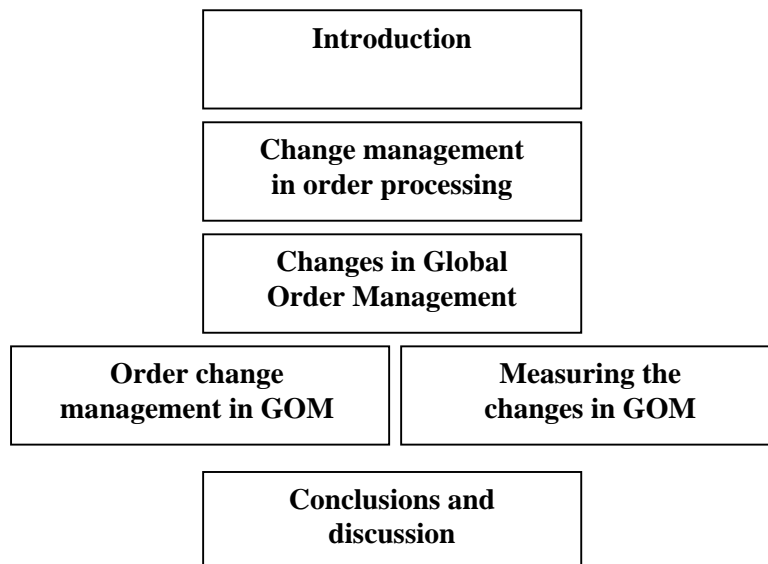


Figure 1. The structure of the thesis

2 CHANGE MANAGEMENT IN ORDER PROCESSING

2.1 Change management defined

Change management literature defines 'change' with several definitions. According to Cooper, change is a necessary fact of project life, and project management must be capable of handling all types of changes. Handling changes well creates long-term business relationships and satisfies customer needs. /2, p.745/ Baca argues that changes are inevitable and can cause negative or positive consequences. Typically a change is recognized as a problem, but it can also be seen to have a positive impact on the project when a customer is willing to pay more. /1, p.16/

Baca defines change management with three key elements: “authority to approve and deny changes”, information on how changes should be handled, and tracking of change requests and executed changes. By using these three elements, change management can be divided into proactive identification and management of modifications. /1, p.16-17/ Baca emphasizes that the purpose of a change management system is to ensure that the triple constraints of time, cost and quality can be achieved. /1, p.20/

Westland discusses that the purpose of a change management process is to identify, evaluate and implement the approved changes. All changes in a project should go through the change management system, and when a change is led through the change management process, it should have a minimal impact on the project. Change management is an important part of project management, and discarding the change management procedure is bound to cause problems in scope management. /4, p.152/

Baca	Change management is defined as proactive identification and management of modifications on projects. /1, p. 16-17/
Westland	“A change management process is a method by which change to the project scope, deliverables, timescales or resources are identified, evaluated and approved prior to implementation.” /4, p.152/
Bolles	“The purpose of the change control process is to identify, record, analyze, track, approve, and implement project change requests”. /5, p.50/

Table 1: Change management process defined by different authors

2.1.1 Analysis of changes

The purpose of a change is not to cause problems for project management, to create need for rework or to impact delivery times or costs. Usually the target of a change is to improve the end product and meet the targets of the project. /2, p.746/ Several defined methods on how changes can be recognized and categorized can be found in literature.

Cooper and Reichelt divide change impacts into two categories: direct and disruption impacts. These two distinct groups can be divided into several subcategories. When a change causes costs for the target of the change only, it is defined as a direct impact; when a change causes costs beyond the target of the change, it is defined as a disruption impact. The category of disruption impacts is widely noted as the most difficult type of change. /2, p.746-747/

Direct impacts

Direct impacts are divided into three subcategories: added expenditure/scope, delays and design uncertainty. Each of these three categories can be measured by its amount of cost.

When the expenditures or the scope of the project changes, the project is defined as an added expenditure/scope, and can be measured by its amount of material or the number of hours spent on it. Amount of material or hours can be turned out to amount of cost. Delays are divided into two types, a delay that extends the duration of the project and a delay that causes disruptive impacts on a project. These disruptive impacts may affect slightly or indirectly to project schedules or costs. Both types of delays can be measured by their amount of costs. When a design changes or necessary decisions for a design cannot be executed, the situation is defined as a design uncertainty. For example delayed design change approval can be a reason for design uncertainty. This can be measured by its number of design changes, and can be used as leading indicator to determine the magnitude of the disruption impact on the project. /2, p.746-747/ Disruption impact is defined on the next chapter.

Disruption impacts

Cooper and Reichelt define the disruption impact as “change-induced additional costs of performing work not directly change”. It can be identified as additional costs caused by lowered productivity or extra work. Disruption is always present when changes are implemented, and thus it cannot be avoided. Disruption impacts are hard to measure due to their complexity and need to be separated from other contributing factors like strikes, difficult labour markets and weak management. Furthermore, when a large number of changes are implemented, the disruption impact can grow cumulatively and the effects need a long period of time to appear.

/2, p.747-748/

Knudson and Bitz have divided changes into two categories: baseline and scope changes.

Baseline changes

Generally a baseline change can be defined as a change of project specification, standards, schedule, resources or budget. Baseline changes consist of four primary sources. Client-driven baseline change is at hand when a client or customer requests change of scope, cost or schedule. Changes in regulations, standards and laws enacted by the government, an institution and a corporate or a corporate division can be seen as regulatory-driven baseline changes. The last two remaining baseline changes are externally and internally driven changes. Economic, political or social changes in the project environment are the main causes for an externally driven change. The main reasons for internally driven baseline changes are divided into four types: scope or technical problems, problems in meeting the schedule, cost problems and resource demand problems.

/6, p.79, 80-87/

Time targets will not be met
Tasks will slip their deadlines
Milestones will be missed
Jobs won't always get started on time
Resources will not be available as planned
Equipment capacity will be overestimated
People will not be available at peak performance
Budget will be either overspent or underspent (depending on the degree of adherence to the schedule and resource allocation)
Work accomplishment will exceed or not meet with the plan

Table 2: Sources for baseline changes /6, p.86/

Scope changes

As the name indicates, scope changes affect the content of the end product or service. Typically scope changes appear as changes in requirements, design, technology, business or personnel. The source of a requirement change is usually the customer who may need a special feature that was not previously known as mandatory. Design changes might occur when a designer needs to change specifications due to the fact that the original scope cannot be achieved. During long projects, technological changes might occur when new technology in the form of equipment material becomes available. Business changes can be the consequence of a rapidly changing business environment. In the modern business world, personnel changes are common, and this often causes modifications in the scope, design and schedule of the project. /6, p.79-80/

2.2 Commonly known change management processes

The change management process is a part of the project execution process and can be defined as a tool for project management. The change management process remains necessary until the project execution phase is completed. All the members of a project team are equal and should be allowed to make change requests. Change management systems and processes can be generally identified with five main levels: preparing, identifying, evaluating, implementing and following up. /4, p.152/

The Construction Industry Institute (CII) discusses the change management system and assigns six purposes for them: to anticipate, recognize, evaluate, resolve, document and learn from conflicts. CII highlights the importance of learning from the mistakes and conflicts; this can be valuable information for individuals who are tied up in a process. CII has created a change management system, which can be modified for engineering and construction project purposes. This system is divided into five process levels: “(1) promote a balanced change culture; (2) recognize change; (3) evaluate change; (4) implement change; and (5) continuously improve from lessons learned”. These five process levels have been developed to work together in order to maximize the benefit available. In all process levels, decision-making plays an important role and adds requirements for effective communication and documentation processes. /7, p.164/

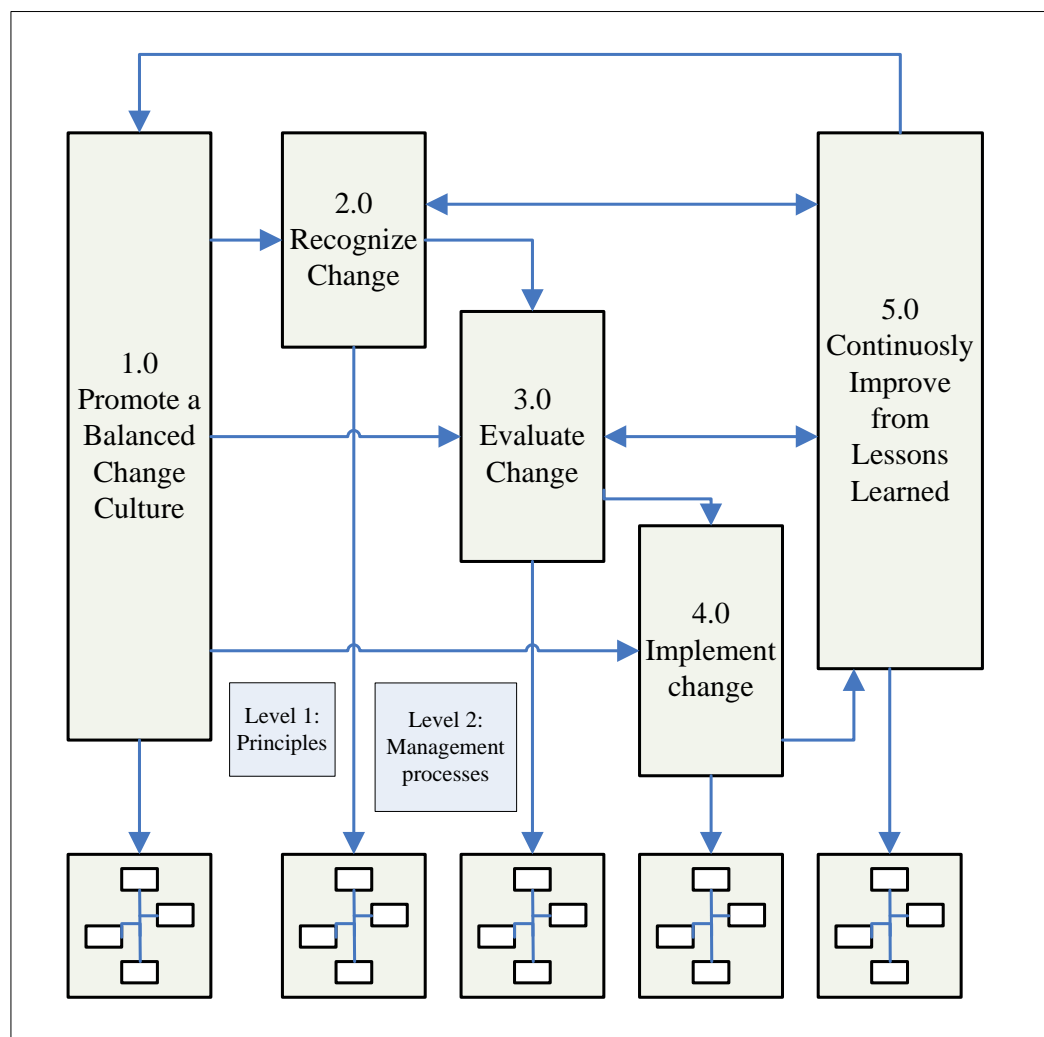


Figure 2: Change management system by Construction Industry Institute (CII) /4, p.160/

Westland defines the change management process with five levels: submit change request, review change request, identify change feasibility, approve change request and implement change request. The change request is a starting point for a process and contains all the necessary information such as descriptions, benefits, costs, impacts and approvals required. During the process, change is reviewed, identified in more detail, approved or cancelled and finally implemented. Westland has included a follow-up process as a part of the implementation process. /4, p.152/

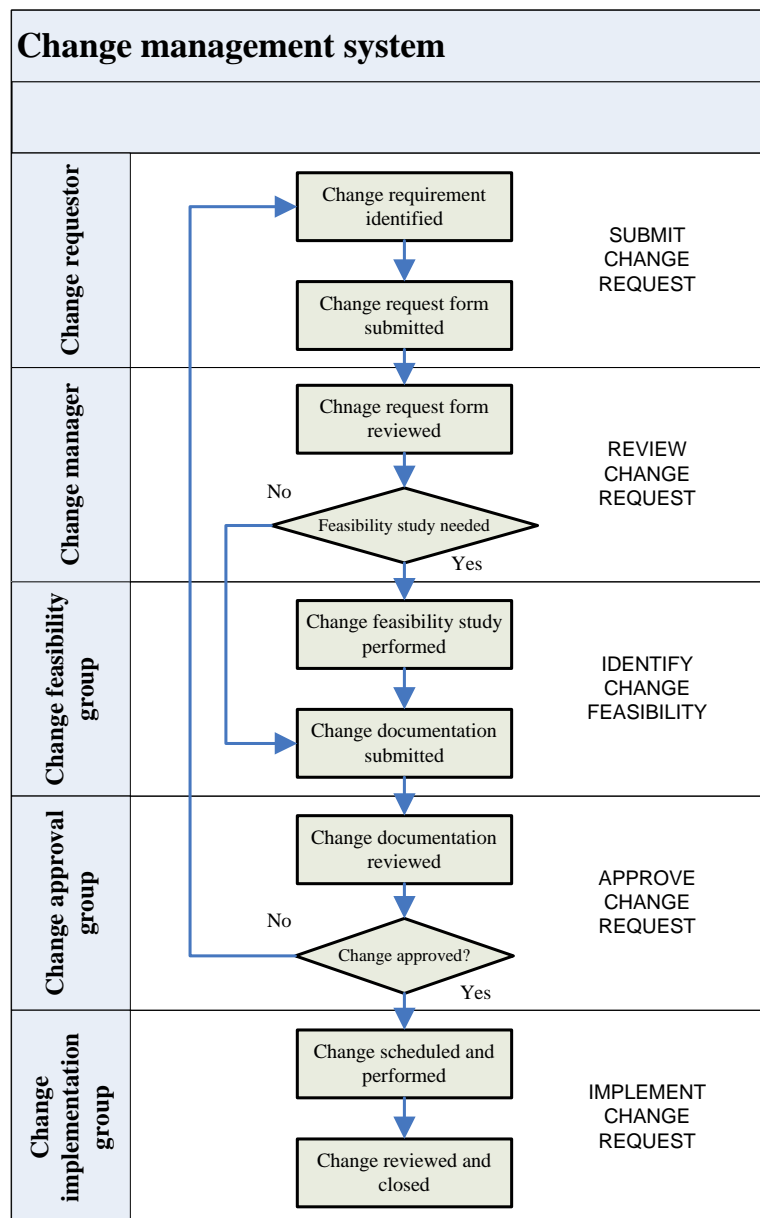


Figure 3: Change management system by Westland /4, p.154/

Table 3 shows how two different authors have defined their change processes. These two authors have used same principles and main ideas on their change management processes. The major difference between these two systems is that Westland close change process after the implementation, but CII continues process improvement after the implementation.

CII	General	Project Management Life Cycle
Promote a balanced change culture	Preparing	Submit change request
Recognize change	Identifying	Review change request + Identify change feasibility
Evaluate change	Evaluating	Approve change request
Implement change	Implementing	Implement change request
Improve continuously	Following up	

Table 3: Change management process phases by different authors

2.2.1 Reviewing the change request

The first step in change management is to identify the changes and divide them into beneficial and detrimental ones. Beneficial changes should be promoted through the organization, while detrimental changes should be avoided. The timing of a change is the most important factor when defining a change as beneficial or detrimental. Sometimes it can be hard to identify the change; when the problem occurs, beneficial changes might change into detrimental ones. /7, p.161/ An efficient change management system requires effective communication and documentation processes, and these processes need to be introduced to all project team members. /7, p.161/

2.2.2 Identifying the change request

During this stage, the change is divided as “required” and “elective”. The change is identified and the change request information is reviewed more deeply. The effects need to be reviewed by the project team, which stresses the important role of effective communication. All process members need to be motivated to have open conversations. /7, p.161/ The effects of the change, such as options, costs, benefits, risks, issues, impacts, recommendations and plans need to be identified and reviewed. /5, p.152 / After the review, change is divided as “required” or “elective”. This principle ensures that the required and mandatory changes proceed without any delay, while more time may be used for identifying the “elective” ones. /7, p.161/

2.2.3 Evaluating the change request

After the identifying phase, change requests need to be evaluated, and the process team should determine whether they should approve and implement the change request. Decisions for the high priority changes need to be made immediately because any delay in decision-making is bound to increase costs. /7, p.161/

Baca highlights the importance of the change request impact determination on the triple constraints of time, budget and quality. If the change request impacts these three constraints, the implementation should be considered carefully. Even if the change request does not affect the triple constraints, it should be considered because it still creates an additional risk. /1, p.39-40/ A lower priority change request should be considered more seriously, and close consideration should be given to whether a change request is necessary. Unnecessary changes as well as changes that do not serve the target should be avoided in order to maximize the profit and reach the goals. /7, p.162/

According to CII, when the original goals, the budget or the schedule are readjusted, the change is defined as an elective change. It should be approved only when benefits are substantially greater than the costs. A benefit-cost ratio (B/C) can be used to determine the change necessity level. Late changes have a higher benefit-cost ratio because the impacts of the change are harder to define. /7, p.161-162/

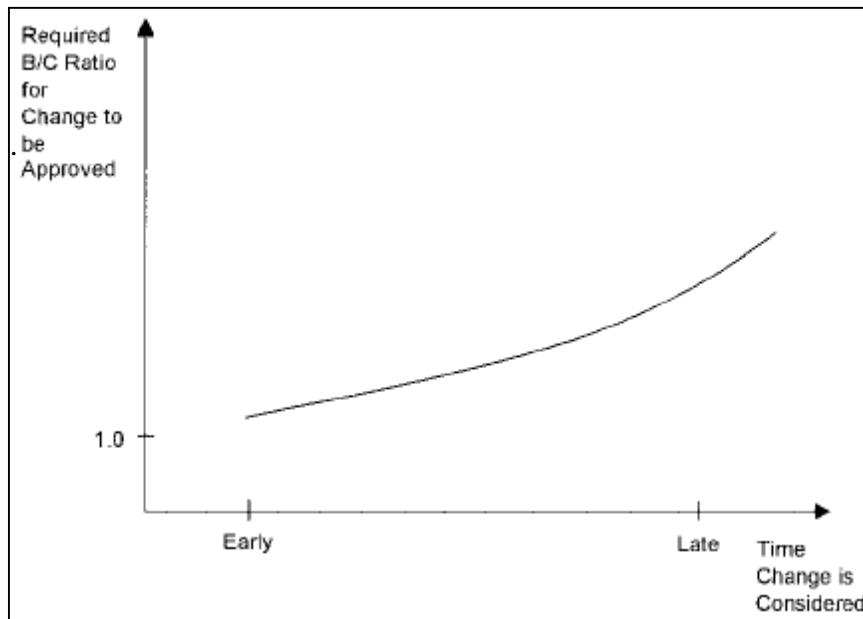


Figure 4: Benefit-cost ratio /7 p.164/

2.2.4 Implementing the change

The most important phase in change management is the implementation of the change. In fact it is the primary reason why the change management system exists. All parties should be informed about an approved change request; if the information about the approval does not reach all parties, there is an increased risk of problems and additional changes occurring. When all parties are informed, there is also a chance to settle out all the other problems. /7, p.162-163/

Baca discusses the importance of updating plans during the implementation process: the schedule, costs and documents need to be updated. /1, p.57/ Recording all change requests and implemented changes helps to resolve impacts later on as well as helps to make use of the information for future development. /7, p.163/

2.2.5 Following up the change

The last phase of change management is to learn from the mistakes and to prevent similar changes in the future. All changes should be recorded in change logs and thus all the information will be available for future development purposes. /1, p.100/ Root causes for major changes should be analysed in a project closure meeting and discussed openly with the project participants. This opens a chance for all the participants to understand the causes of the changes and to develop the process in order to decrease the amount of changes in the future projects. /7, p.163/

3 CHANGES IN GLOBAL ORDER MANAGEMENT

This chapter concentrates on the current situation of change management and the most common reasons for changes in the GOM department. In 2007 Lotta Haakana reviewed the current status of change management in the GOM department in her master's thesis *Change management in delivery processes*. In year 2008 a new organization structure came into effect and changed GOM into a literal order management department without large-scale design coordination and project management activities. Before organizational change came into effect, the orders received by the GOM department were a mix of pure component orders and delivery projects coordinated by the project manager.

In the following chapters, the current process is reviewed using the master's thesis *Change management in delivery processes* as the main reference.

3.1 Current change process practices

The current state of the change management in GOM is very explicit: a formal change management process is missing. Changes are managed in several ways, and due to missing instructions, new employees create change management processes of their own based on the verbal advice from experienced employees. It can be said that the GOM department sees changes as problems that need to be solved.

Haakana recognizes three independent change process phases at the GOM department: implementing, communicating and negotiating the effects. /3, p.56/ The reason for this conclusion is very simple: all these process phases are necessary functions even in a poorly managed change management process. At the GOM department, change implementation is carried out case-by-case depending on the type and difficulty of the change. /3, p.57/ The impact of a change is often defined roughly as occurring due to lack of time and missing procedures. This creates an increasing risk that the implemented change affects unchanged work and creates unplanned costs and delays. /3, p.58-59/

Communication has an important role in change implementation, and the key idea of effective communication is to deliver necessary information to correct people at the right time. /3, p.57-58/ Email is used as the main communication channel, but all primary change information travels automatically between the systems. /3, p.58/ Information is often documented poorly when communication is carried out on the phone or during face-to-face conversations, and this becomes a problem when change related discussion needs to be carried out after a long period of time.

In the GOM department, the process starts when an order coordinator reviews the new change request. If the change request is delivered with inadequate information, more information needs to be requested from the change requestor. After a successful review, the order coordinator determines the impact of the change in cooperation with a production planner. In cases where the change is caused by an internal mistake, the impact on the frontline unit and on the customer is avoided as is deemed possible. Change impacts, costs and delays are discussed together with the frontline unit and agreed on before the change request is implemented. When a change request is clear, it is implemented in the ERP system, and revised change related documents are delivered to the appropriate manufacturing unit. In the current undefined process, the change management process ends when a revised order confirmation is sent to the frontline unit.

3.2 Causes for changes

To be able to control changes, it is necessary to understand why changes occur and where they come from. The sources of changes can be defined roughly by dividing them into four groups: the customer, the frontline unit, GOM and the manufacturing units. Changes caused by these groups are analysed accurately in chapters 3.2.1 - 3.2.4.

Haakana divides the causes of changes into several categories based on the result of an empirical analysis. /3, p.73/

- Inadequate initial information and assumptions
- Mistakes
- Problems in coordination of design
- Clarifying specification by customer or designer
- Inadequate learning from experience
- Time pressure and internal culture
- Division of the delivery scope
- Information flow breaks
- Changing products, standards and regulations

Some of these causes can be a consequence of another and the other way round. /3, p.73/ On the basis of this analysis, it can be deduced that Konecranes' internal mistakes and carelessness cause a major part of the changes while customer changes are in the minority. The two largest causes are non-standardized processes of the internal project management and design. It is important to notice that the root causes of changes are usually unclear or undefined processes, missing instructions, inexperienced employees, the lack of training and, the last but not the least, the lack of time.

3.2.1 Changes from the customer

Regulations, standards, the customer situation and requirements should be clear when a crane is sold. A poorly defined contract in the beginning is the first step in causing changes during the project.

When the contract has been signed, the designer from Konecranes moves on to discuss detailed specifications with the customer. The time for these discussions is limited and all aspects cannot be viewed, and the result often depends on the

expertise of the Konecranes' designer and the frontline project manager. Even if the contract is defined perfectly, changes might occur: the crane can be a part of a large project and usually changes are common in such environment. Some issues need to be defined during the design process, and in the worst case changes might occur to components in manufacturing. /3, p.73-85/ The most typical reasons for changes from the customer are listed on table 4.

Customer change requirements
Change in customer project
Change in standards or regulations

Table 4: Typical reasons for change, caused by the customer

3.2.2 Changes from the frontline unit

Changes from the frontline unit partially overlap with changes from the customer. Two main sources for changes can be identified as project management and design. Non-standardized project management procedures allow internal mistakes, and learning from previous mistakes also becomes more difficult. Missing documentation of changes allow the frontline unit to repeat the same mistakes in future projects. Due to Konecranes' internal project management culture, in many cases the design is started before all the details of the project have been agreed on. If special requirements have not been introduced to the designer, the designer starts designing based on the normal requirements, and changes might come up when the customer's approval of the drawings is requested. /3, p.73-85/ This method is very risky and the result varies from success to total failure. Tight delivery schedules have the effect that the project manager has an external and internal pressure to release long delivery time components into production before the complete crane design is finished and approved. Occurred changes lead to a situation where the advantages of this method can be impugned. Typical reasons for changes by frontline units are listed on table 5.

Poorly defined contract between Konecranes and the customer
Non-standardized project management and design processes
Mistakes or changes in design
Human factor (typing errors, mistakes)

Table 5: Typical reasons for change, caused by the frontline unit

3.2.3 Changes from GOM

In the present organization structure, project management and design belongs to the frontline unit. This reduces dramatically the number of changes caused by the GOM department. Changes caused by the GOM department are usually a consequence of missing or misunderstood instructions, typing errors or unclear orders. These changes are hard to avoid completely because comprehensive instructions cannot be created and human workers are bound to make mistakes.

Orders in the GOM department are received by email, fax or on paper. The order coordinator types the orders manually into the ComActivity system, which may easily lead to typing mistakes. It is important to notice that these minor typing mistakes may easily create a critical problem to frontline unit when components have been received. The order coordinator at GOM has a responsibility to check all the orders received from the frontline unit; sometimes, however, an unclear order makes its way into the system. How often this happens depends highly on the knowledge and experience of the employee. It is important to notice that the number of critical changes caused by the GOM department is smaller than that of the frontline unit because GOM does not produce any added value to concrete products. Added value can be described as designing or component specification. Typical reasons for the changes from GOM are listed on table 6.

Missing or misunderstood instructions
Typing errors and mistakes
Mistakes caused by the unclear orders

Table 6: Typical reasons for change, caused by the GOM

3.2.4 *Changes from manufacturing*

The most common change from manufacturing can be defined as a request to correct a discovered mistake in items such as drawings, an order code or additional information. Even though the main task of production planning is not to prevent mistakes made by others, a large number of mistakes are still discovered. This sets an important role for the production planning on the entire supply change.

During the first phase of production planning, the component order is reviewed and if necessary, additional information is requested from the order coordinator at the GOM department. Even though reviewing reduces the number of mistakes, some mistakes are still discovered when a subcontractor reviews the order before starting the manufacturing. Sometimes mistakes are discovered in the assembly phase because components do not fit together. This is the worst case, and causes delays and additional costs almost without exception.

Changes from manufacturing nearly always have a negative effect but in certain rare cases changes might affect positively, for example by reducing the delivery time of a component. Typical reasons for changes from manufacturing are listed on table 7.

Typing error in order code
Typing error in order form
Design mistake in drawing
Discrepancy between order code and additional information
Additional information missing
Ordered component cannot be manufactured

Table 7. Typical reasons for change, requested by the manufacturing unit

3.3 Impact of changes

The figures 5 and 6 represent the information flow through the component supply chance of Konecranes Heavy Lifting. Information flow between Customer-Frontline-GOM is excluded from these figures. Figure 5 presents a typical information flow when an implemented change affects the manufacturing unit in Hyvinkää. The length of the information flow depends on the manufacturing status and magnitude of change.

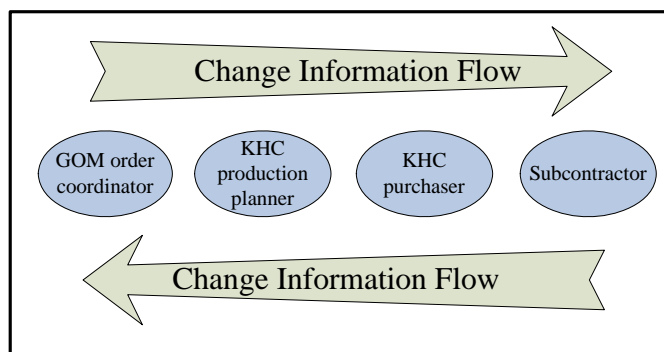


Figure 5. Information flow when manufacturing location is Hyvinkää

Figure 6 presents the information flow when the manufacturing location is abroad. There are two different cases in use when component is manufactured abroad. On the first case, altogether six process participants can be affected during the change implementation. On the second case, seven process participants can be affected during the change implementation.

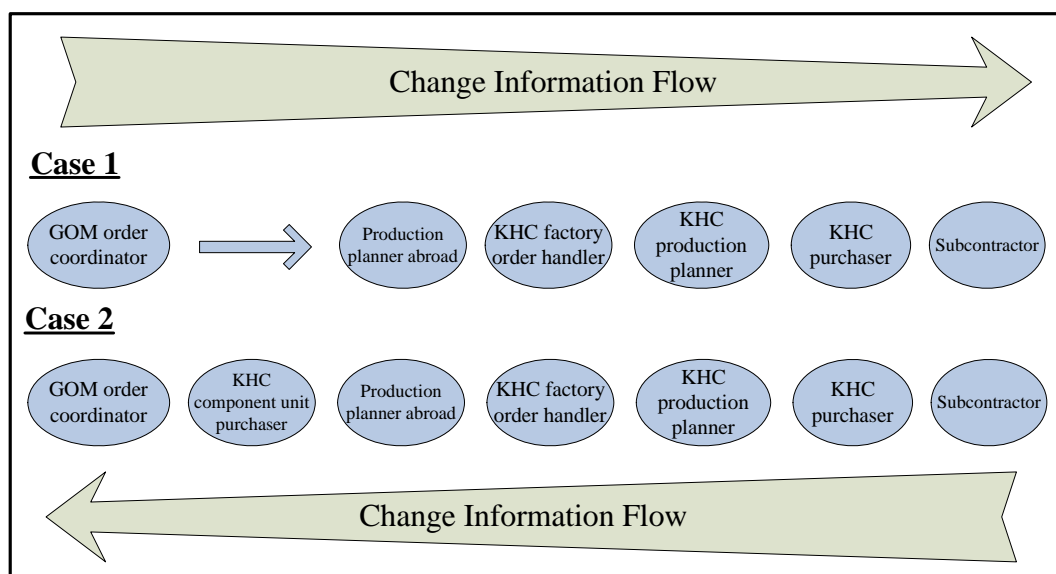


Figure 6. Information flow when manufacturing location is abroad

In the worst case, the impact of a change applies to the whole supply organization and causes delays and additional costs. It is hard to measure accurately the total cost of a change because typically the overall impact consists of two distinct categories: direct impact and disruption impact. These both types of impacts are always present when changes occur. Direct impacts can be measured in the amount of cost, for example cancelling costs and product revision change costs, and can be easily measured accurately. Disruption impacts are hard to measure due to a wide scale of different disruption effects, as it can occur as lowered productivity, delays or overtime use. When the analysis of disruption impacts is performed, it is important that general manufacturing difficulties are excluded from the analysis.

3.4 Conclusions

Customer based changes are in the minority in comparison with the overall number of changes in different projects. Most of the occurred changes are due to Konecranes' internal processes. All internal changes are gratuitous and therefore their occurrence should be avoided.

The paramount issues causing changes in projects seem to be design and internal project management. The frontline unit is responsible for the project management as well as the coordination of design and thus has the largest individual impact on the performance of the entire supply change. Especially the quality of design has a dramatic effect on the progress of a project and on the number of changes required. The situation becomes very critical if a design process begins with poor specifications regarding the project and components of long delivery time are released to manufacturing. In the case that the customer does not approve of the crane layout drawing and specifications, critical changes might be necessary for the components in production.

The main purpose of the GOM department has become to coordinate the change discussion between the frontline unit and manufacturing. Several problems can be found with the current procedure. Instructions on how changes should be coordinated are missing and this has caused unclear situations. The process interfaces have not been defined, and sometimes participants are confused about who should take the next step. There are also problems in the manufacturing ERP system. Change management tools are designed for Standard Lifting purposes and do not serve the needs of Heavy Lifting. Change management without efficient tools is causing considerable extra work for the production planning. Information on all the changes can be found in the system but sometimes the production planners do not notice the change due to insufficient change management tools.

Changes are creating additional costs in manufacturing. The total cost of the changes is difficult to determine because all of the changes do not go through the GOM department. Some problems also have been met in the manufacturing ERP system regarding the registration of working hours, costs and purchases. These are

registered into the ERP without formal manner and are therefore demanding to analyse.

In conclusion, changes are handled in the case organization unsystematically. This causes problems, expenses and additional work for all the process parties.

6 Conclusions and discussion

Starting point

Lotta Haakana studied the change management process in the GOM department in 2007 when the previous organization structure was still effective. Her master's thesis concentrated on how changes should be managed, which changes should be managed, and how changes are being managed at the moment. Haakana concluded that changes in the case organization were managed in an informal manner, and Konecranes' internal processes caused a major number of the changes.

In 2008 a new organization structure became effective and changed GOM into a literal order management and coordination department. This bachelor's thesis was begun because the GOM department still missed a formal change management process. All changes were handled and implemented using various methods. This has caused problems in order coordinating and difficulties when verifying changes afterwards. After all, the need for change management was current, and therefore this bachelor's thesis concentrates on finding out a practical solution.

Development

Defining the change management process began by identifying the needs and determining the guidelines. The GOM department needed an effective system without unnecessary bureaucracy. This led to the conclusion that following guidelines were necessary during the design:

- Usability of change management process
- Smoothly continuing process (avoiding unnecessary bureaucracy)
- Available information on changes for process analysis and improvement purposes

It is important to make the changes go through a single well-balanced process. Due to this, there was only one choice: to create simple process models for change management in GOM. It is a paramount issue that change management processes are simple and effective in practice. Processes will not be followed if they are complex, which would create more disadvantages than advantages

Reports are necessary tools when changes are analyzed. The GOM changes report has been created to promote internal process improvement. All significant changes on the projects should be analysed focusing on Konecranes' internal changes. The GOM change report is delivered for all frontline units regularly, and they should take actions to minimize the number of internal changes.

Results

As results, this thesis offers process descriptions and instructions. The change management process is ready to be put to practice in the GOM department. In order to make the process fully effective, it has to be improved during the implementation. The reason for this is that processes cannot be designed to perfection without feedback from the end users during the implementation. All comments from order coordinators regarding the system need to be reviewed and necessary actions need to be taken. The results of this bachelor's thesis can be evaluated when the change process has been implemented in practice.

This thesis has reached its target that was set in the beginning. The GOM change management system will be implemented into practise during the year 2009.

Future development

Change management can be implemented to the GOM department but it would be more important that processes would also be improved on the frontlines. Currently project management on the frontlines is performed using ad-hoc methods, and common general instructions are missing in the project management. Because of this, it would be crucial to create common general rules and process descriptions for all the frontline units. This is a very challenging task but it would bring huge benefits to the entire supply chain.

Change management does not concern only the GOM department and frontline units because also manufacturing units worldwide are part of the delivery chain. At the moment, manufacturing units are using the iLM ERP system. This system has been created for Konecranes Standard Lifting and does not support the needs of Heavy Lifting. The iLM system does not contain effective change management tools. This is the reason why it is essential that development resources would be allocated to the iLM system, too.

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