Optimizing the inventory management in order to achieve reduced lead time for operations

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Preface

This master thesis has been written by Petruş Ghiţă as a graduation assignment for the Logistics Management Master course at the Rotterdam Business School (RBS).

The subject of the thesis is the investigation of how the inventory management of KLG Europe (Romania) can be optimized in order to reduce lead time for operations. KLG is a 3PL provider which has branches in the Netherlands, Turkey, U.K., Romania and China.

This subject has been chosen because of the importance of inventory management, for some companies it is the most vital activity and major costs can be reduced as well as huge profits can be obtained. Due to the researcher’s Romanian background, the choice was made to conduct the research at the Romanian branch of KLG in Bucharest.

The researcher travelled to Romania for a period of approximately two months in order to investigate and be able to understand the current situation at KLG and offer proper recommendations to the management of the company. The time spent in Romania required adaptation; both linguistically as well as culturally. The thesis has been written in English while the business language at KLG Europe in Bucharest is Romanian.

It has been a pleasure to be here in Bucharest, the researcher has obtained valuable and unique information regarding logistics, which would not have been obtainable from theoretical sources. The people at KLG have been very open and helpful and therefore the researcher would like to thank everyone from KLG Europe who has contributed to this thesis.

Special thanks to the supervisor at KLG Europe, Mr. Paul Niţă (Logistics Director) and the supervisor in the Netherlands Mr. Paul Cadovius. Also special thanks to Mr. Hagemeijer for his help regarding Research Methodology and Mrs. Osentoski for all her advice.

The researcher wishes the reader of this thesis a pleasant reading experience!

Petruş Ghiţă
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Executive summary

This report provides an analysis and evaluation of the inventory management of KLG Europe Romania SRL. The main research question includes the investigation of the inventory management of KLG in Bucharest and how this can be optimized in order to achieve reduced lead time for operations. The sub-questions consist of the investigation of the current state of the lead time for operations, the order picking process and the inventory management as a whole. Furthermore the experiences of the management as well as of the warehouse employees were included in the report for comparison and to point out any discrepancies.

The research method which has been used consists of qualitative research, a case study of KLG’s current situation. The data collection techniques which have been used are interviews and observation as primary data and documents as secondary data. The documents which have been used include; official company documents, reports, relevant internet websites, academic articles and literature.

Results of the analysed data show that the current lead time for operations in the warehouse of KLG differs per customer and order. Because of the fact that; Orange, Adidas and in the future Coty, have their private allocated warehouse spaces, the lead time for operations is different than the other customers which have been allocated the normal storage locations. Regarding the replenishment, KLG must be flexible and react fast to customer’s demands because of the fact that the replenishment at KLG’s warehouse is variable. This makes it also difficult for KLG because sometimes unexpected things happen, e.g. a large increase in stock from the customer’s side, which leads to too many products ‘in time’. The picking at KLG is conducted through batch/multi-order picking which allows the picker to collect multiple orders during one route. Unfortunately human mistakes as well as IT errors occur during picking which slow down the process. KLG’s SKU’s are divided in shelves, racks and bulk, depending on the customer. Due to the fact that the cycle counting in the warehouse is not frequent enough, product locations and stock accuracy are not optimal. The ABC-analysis is used continuously to determine the appropriate storage locations for the different products. The stock accuracy is high at KLG (higher than the industry average in Romania) but not perfect, because of lack of control in the warehouse. Specific problems occur in the warehouse with whom the employees have to deal with on a daily basis, being flexible is vital.

The report finds that the current situation of the inventory management is not optimal and needs improvement in order to be able to reduce lead time for operations. The major areas of weakness, which are presented by the researcher, require remedial action by the management.

Recommendations discussed to improve the inventory management include:

- Communication must be improved between warehouse employees and the management;
- Warehouse employees must understand the consequences of their actions;
- Communication between KLG and the customers must improve;
- Reorganize the locations and storing modes for some customers and products to reduce the travelling distance for pickers;
- Improve monitoring and control of the employees within the warehouse;
- Increase the efficiency of the reception process,
- Improve the picking process by reducing the amount of human as well as system errors;
- More cycle counting of stock locations and accuracy;
- Consult and educate the customer regarding logistics;
- Get rid of products which have been “stuck for too long in the warehouse”.
Despite the fact that the research has been thoroughly prepared, limitations and shortcomings occurred; the research was conducted for two months at location in Bucharest which is not enough to fully understand the situation at KLG.

The amount of interviews was limited to a small group, but with different functions. To have 100% valid conclusions, all employees should have been interviewed which meet the criteria. It is also not possible to say that the answers which have been received are 100% true.

The observation which the researcher carried out cannot be 100% objective because of the researcher’s own experiences and perceptions.
Chapter 1. Introduction of the company

This first chapter is the introduction chapter of the thesis which explains what KLG is and what it does as a company, both on the Romanian market as well as internationally. It continues with a short history of the company, the background of the assignment and ends with the involvement of the researcher within the company.

1.1. KLG on the international market

According to the official website of KLG; “KLG Europe is an international operating logistics company from the Netherlands with its headquarters in Eersel, and with key locations in The Netherlands, Romania, UK, Turkey and China. The company offers a large range of services; road, air, ocean freight as well as warehousing and value-added services with focus on solutions for the markets in Western Europe and CEE.” (KLG official website, 2013)

According to Baack et al; “Warehousing is the process of storing products until they are sold”. (2013, Chapter 11) The five tasks of distribution according to Baack et al are; materials handling, inventory location, inventory control, order processing and methods of transportation. (2013, Chapter 12)

KLG focuses on planning, organisation, management, control and execution of operations in the supply chain, transportation and warehousing. Because of the increasing sophistication of transport and logistics, the company has evolved over the years, making sure that all parts of the company are on the same line and operate correspondingly and also reach the highest level of performance possible. (D. Moore, p.3, 2010)

1.2. KLG in Romania

According to the official KLG document “KLG in a nutshell 2012”; “KLG expanded to Romania due to strategic reasons; the country’s location and logistics possibilities. The Romanian market is a large consumer market and furthermore the country has the largest port of the Black Sea and is on the route of two important pan-European transport corridors: river corridor on the Danube and rail-road corridor IV.” (2012)

“The company has six locations in Romania at the moment. Romania has become one of the largest investment destinations in South-eastern and Central Europe, especially for Dutch companies, and due to this fact all major logistics players have entered the Romanian market in one way or another. With this continuous growth the country could become the Eastern gateway and trade hub of Europe. The warehousing locations of KLG in Romania are equipped with state-of-the-art technology and a fleet of 230 trucks which are partially owned by KLG and partially by reliable subcontractors.” (author KLG in a nutshell 2012, 2012)

Bucharest (HQ)

The company has located the headquarters of Romania in Bucharest, the capital city of Romania, next to highway A1 Bucureşti-Piteşti near Bolintin Deal. The company manages the other branches within Romania from this location. The warehouse, which is new and modern, provides a large range of logistics activities. From here, distribution in countries as Bulgaria and Greece can be coordinated.
The other branches within the company serve as hubs, where products arrive mostly from Bucharest, and supply all areas of Romania as well as foreign locations. KLG had a turnover in Romania of approximately 19.3 million euros in 2011. The turnover has increased significantly since the establishment in 2006. (author KLG in a nutshell, 2012)

**Cluj Napoca**

The location in Cluj Napoca, covers the North-western part of Romania as well as Ukraine and Hungary. The location offers storage as well as cross dock activities. (author KLG in a nutshell, 2012)

**Constanța**

Constanța is the largest Romanian port and the 8th in Europe based on the quantity of TEUs handled (containers). Due to lower costs in comparison to Rotterdam, Hamburg or Antwerp companies can reduce costs and lead-times within their supply chains. (author KLG in a nutshell, 2012)

**Craiova**

The Craiova location distributes to the South-western part of Romania and also offers groupage activities. (author KLG in a nutshell, 2012)

**Brașov**

The location at Brașov distributes to Northern Romania as well as Moldavia, it offers storage services as well as cross dock facilities. (author KLG in a nutshell, 2012)
Timişoara

The location of Timişoara is very convenient because it can reach all countries of the CEE within 1000km. Together with the location in Bucharest, KLG can deliver throughout Central and Eastern Europe. Major costs were reduced for companies who are active in countries as: Austria, Hungary, Serbia, Slovenia, Croatia, Czech Republic or Poland. This was achievable thanks to high-quality services offered by KLG together with lower labour costs. (author Broşura KLG, 2013)

Bacău

The hub in Bacău does not belong to KLG, the location has been “rented” under a contract with another company which handles the services there. (author KLG in a nutshell, 2012)

It is important to note that the majority of the shares of KLG in Romania belong to Dragoş Geleţu who is a Romanian entrepreneur. The rest of the shares belong to the Kuijken brothers. Furthermore the employees in Romania are all Romanian which makes it easy for the Romanian branch to operate smoothly, but difficult to apply the Dutch way of doing business. The Romanian branch has its own way of doing business and it is an advantage because it “fits” in the Romanian business environment and it has been successful ever since establishing in Romania, this can be concluded based on Figure 2.

1.3. Headquarters in Bucharest

The headquarters in Bucharest has a warehousing facility of around 21,000 m², as well as offices, conference rooms and other facilities. The other 14,000 m² are located a few kilometres away from the headquarters. The plan is to expand the current 21,000 m² with 10,000 m² more. (author KLG Logistics Services, 2013)

Domestic transport

The location in Bucharest offers road freight throughout the country with a 24/48 hours coverage guarantee, furthermore the possibility of delivery to international locations as well as express or Saturday deliveries. It also has good connections with the Henri Coanda Airport. (author KLG Logistics Services, 2013)

International transport

Regarding international transport, KLG can facilitate imports and exports, groupage, parcel and dedicated shipments, general cargo and DGR goods because of its well-developed network. International airfreight is possible thanks to the good connections with Henri Coanda airport. Furthermore door-to-door, door-to-airport or any other delivery terms are available as well as customs clearance for both normal and DGR goods. (author KLG Logistics Services, 2013)
Logistics

The warehousing locations of KLG in Bucharest are divided among two locations and are equipped with the integrated security system TAPA, VNA racking, professional warehouse management system, and hi-performance intra logistics.

KLG offers value-added services to its customers: complete inventory, pick & pack, repacking, labelling, quality control, kitting, assembly, promotional and seasonal activities on demand, invoicing, reporting and much more. (author KLG Logistics Services, 2013)

Logistics engineering

The team’s knowledge and experience in combination with state-of-the-art facilities offer KLG the possibility to be flexible and offer customized solutions to its customers that integrate all components of the supply chain management. Furthermore, the company possesses its own EDI interfacing team. (author KLG Logistics Services 2013)

According to Ford: “by using Electronic Data Interchange (EDI), or other methods of integrated system-to-system exchanges, companies have made significant improvements, benefits and savings.” (Finance Director, 2007)

Because customers are integrated in an electronic trading community, they can reduce manual work and administration, which leads to lower process operating costs as well as increased productivity. Growth becomes possible for companies while avoiding associated costs, which is what KLG wants to keep on doing. (Ford, Finance Director, 2007)

Sea freight

The Port of Constanța offers cost-effective, safe and reliable solutions for FCL (Full container) and LCL (less than container load) types of shipping for inbound and outbound services. Between China and Romania, weekly LCL deliveries take place, while at the Port of Constanța itself; transport, handling, intermodal and branch solutions are the executed activities. (author KLG Logistics Services, 2013)

The location in Bucharest has 165 employees with a staff retention rate of 95% and shift schedules from 7:00 – 16:00 and 12:00 -21:00 for the warehouse employees. The employees at the offices work from 9:00 until 17:00. (author KLG Logistics Services, 2013)

1.4. History of the organization

According to the KLG company report of 2010:” In 1918 KLG was formed by the grandfather of Mr. K. Kuijken and Mr. A. Kuijken. Because of World War II, the trucks which KLG owned at that time were confiscated by the Germans. This forced the company to start over after the end of the war. The company was split into three parts in 1964 among the three sons of Mr. Kuijken, the founder.”

“In 1998, Mr. K. Kuijken and Mr. A Kuijken took over their father’s shares and afterwards also one of their uncle’s shares which made them 66% owners of KLG. The company has known substantial growth from the mid-90s. Each year the company grew at least double digits, apart from 2009 when the company experienced a drop due to the financial crisis.” (KLG company report, 2013)

The main business of KLG is European distribution and part loads. The company has extended services from the Netherlands to the U.K and Romania into the rest of Europe. The company has around 120.000 m² of warehousing divided among the Netherlands and Romania. Besides truck freight, the company is substantially concentrated on air and sea freight. KLG established itself in Romania in 2005; the company now employs around 350 people and has an annual turnover of 21 million euros (KLG company report, 2013).
1.5. Types of customers

KLG Europe Romania SRL has different kinds of clients in its client portfolio. There is a variety of clients ranging from LG to Wrigley. Besides the fact that the customers sell different products, there is also a difference in importance. The difference in importance is based on the impact the client has on KLG and vice versa. In the case of Vodafone, Adidas and Coty, the clients have stored all their products in the warehouses of KLG. Due to the fact that these clients have big names and are important for KLG, separate warehouse locations have been designed and assigned to these customers. This means that the clients are dependent on KLG’s quality of services and how it manages their inventories, while on the other hand KLG is dependent on the prestige that it gains from these clients and which is important for the market position of KLG.

1.6. Nature and background of the assignment

Because of the fact that costs and competition nowadays are increasing among logistics companies due to high fuel prices and the huge demand for transportation services, these companies must satisfy customers efficiently while making profit (Angheluţă & Costea, 2010).

KLG has established long term partnerships and participation in powerful networks as ASTRE, 22Plus and WCA which enables the company to offer a wide range of services in Western Europe, former CIS countries, Central and Eastern Europe, Turkey and China.

The focus of this research will be on the headquarters of KLG Europe in Romania, in Bucharest. From here the company focuses on domestic transport, international transport, logistics engineering, sea freight and has 35,000 m² storage locations (integrated security system TAPA standard, VNA racking, professional warehouse management system, high-performance intra logistics).

KLG Europe faces the same problems as other logistics companies, those are the reasons why costs must be reduced as much as possible while also keeping the customers satisfied in the future. Inventory management plays an important role in the satisfaction of customers and cost reductions. According to Stevenson (2012, page 555) “Inventory management is a core operations management activity. Effective inventory management is important for the successful operation of most businesses and their supply chain. Poor inventory management hampers operations, diminishes customer satisfaction, and increases operating costs.” Thus these reasons apply also to KLG Europe Romania SRL (Bucharest) and that is why the company should continuously improve the inventory management of its warehousing locations all over the country.

1.7. Own involvement in the project/company

The research for KLG Europe Romania SRL was conducted in order to be able to offer useful recommendations to the management regarding the improvement of the inventory management which would lead to reduced lead time for operations. Reduced lead time for operations will lead to reduced costs and more profit for KLG which is important if the company wants to continue to grow and compete with other logistics companies.

The research consists out of the analysis of company documents which contain data that is relevant to inventory management, lead time and stock accuracy. Furthermore observation was used to analyse the warehouse facility with all its services as well as how the employees execute their tasks. Interviews were conducted to understand how the management and employees view the current status of the inventory management, to find out if there are any discrepancies.

At the end of this document, clear conclusions and recommendations are presented to the management of KLG Europe Romania SRL (Bucharest).
Chapter 2. Theoretical framework

The main research question is; How can the inventory management of KLG be improved in order to achieve reduced lead time for operations? To be able to answer this question and offer proper recommendations to the management of KLG, it is necessary to investigate the field of warehousing and in particular the inventory management activities. The contributions of the different authors to the field of logistics and in particular to warehousing and inventory management will be presented and also discussed how their ideas are applicable to KLG. The literature which has been chosen is relevant and valuable to the research because of its specific focus on the subject matter.

2.1. Literature review

- Angheluță and Costea describe why logistics companies must try to remain competitive and why this competitiveness has risen. The main idea is that companies must satisfy customers efficiently while making profit. The authors give a good description of the background of this research. On the other hand it is important to keep in mind that no situation is identical to another. With these ideas in mind, the researcher has investigated what the current situation is at KLG and how the inventory management of the company can be improved in order to achieve reduced lead time for operations.

- Baack et al give a general and short description of what warehousing consists of; but for KLG warehousing means much more. Baack et al give a description which in principle is sufficient but it does not include all the aspects of warehousing. The authors of International Marketing describe what the five tasks of distribution are; this covers a larger part of what KLF offers as services.

- Ford, the writer of “E-Procurement-Electronic Data Integrations Comes of Age”, explains that companies have improved through the use of EDI and that productivity has gone up while costs have gone down. The writer does not mention that in order for a company to have such a system, it is important to first invest in the purchase, application and training of staff. It is important to keep in mind that for many companies it is too expensive to implement such a system.

- Stevenson, the writer of Operations Management explains the importance of inventory management and its huge impact on the success of businesses and supply chains. Costs can increase and customer satisfaction can diminish if inventory management is not handled appropriately. These ideas support the researcher’s ideas that inventory management is one of the most important aspects for many businesses. Thus, it supports the idea of why writing a thesis regarding inventory management is acceptable.

- Coyle et al, writers of “Transportation a Supply Chain perspective”, describe what type of 3PL providers exist and what these types of 3PL providers should deliver regarding services for customers. It was important for the research to categorize KLG as a 3PL provider and investigate if the company delivers what it should deliver as a logistics company. To conduct a proper research it was important to know from which perspective to start. Depending on the type of 3PL provider, the goals would have been different which means that some aspects are more important than others. Coyle et al give a definition of KPI in their book and also why these are important for a company. It was important for the researcher to investigate which KPI’s are important for the inventory management of KLG, but keep in mind that for KLG the importance can differ from what Coyle et al describe in their book.

- Kotler describes what inventory management means and what its goals are. Kotler’s definition and description of inventory management adds to the researcher’s image. To get an adequate and objective view of inventory management it was necessary to collect data from various authors instead of basing the research on a single description. It is interesting to
state that there is no general description of inventory management, depending on the author the emphasis is on a different aspect of inventory management. This means that Kotler’s description must be taken into consideration but not blindly adopted as the “main” description of inventory management.

- Adeyemi and Salami have written an entire paper on inventory management and how inventory management can be a tool for optimizing resources. They have a description of inventory management of their own; their main emphasis is on costs and trying to reduce these by having an efficient inventory management. It is important to keep in mind that the authors have mainly focused on manufacturing companies while KLG is a 3PL provider, although their description is valuable to the research.

- Denise Loter-Koch, writer of the article “Effective Inventory Management”, has focused her definition of inventory management more on time, efficiency, and the use of computerized systems. Another important aspect is the fact that trends can easily be spotted if rotation of products is monitored correctly. This can be linked to the ABC-analysis which is also the principle that KLG uses to determine the most appropriate storage locations for its products, but also monitor the rotation of the products. The writer does not focus in her article on the fact that not every business can afford to implement sophisticated inventory management systems. The researcher does not agree with the title “Effective Inventory Management” because it leaves the impression that in order to achieve this effectiveness a company should exactly follow these steps, while in reality it depends on the company what is most suitable.

- Napolitano mentions is his article “Top eight guidelines to improve inventory management”, the use of ABC-analysis in combination with slotting. These two methods are already used by KLG and the researcher investigated how this is being done and how it contributes to the inventory management of the company.

- Lee explains what stock accuracy is in its article regarding cycle counting and inventory accuracy. Stock accuracy is a very important part of inventory management; therefore it is important to investigate the stock accuracy at KLG; when the accuracy is being checked and why errors can occur. Lee links its ideas and principles to the ABC-analysis and mentions in its article the division; A products 10%, B products 20% and C products 70%. There are different numbers and perceptions regarding the ABC-analysis by different authors, thus it was important that the researcher investigated multiple sources regarding the ABC-analysis and its characteristics.

- Jacobs et al discuss another important aspect of inventory management, lead time. It was important for the researcher to distinguish the types of lead time. For this research it was important to focus on lead time for operations within the warehouse, and not the lead time including transportation. By focusing on the lead time for operations within the warehouse the researcher can offer clear recommendations regarding the inventory management.

- Rajaniemi describes the five different types of lead time, but some of these types are not relevant to KLG. (e.g. manufacturing lead time) Therefore it was important for the researcher to select the types that are relevant to KLG and focus on these to see what improvements can be achieved.

- The picking process is a very important part of the inventory management. If the inventory management is appropriate, the picking process is facilitated. Roodbergen explains what the picking process consists of and the existing types of picking, the researcher had to choose the one that is suitable for KLG. Le Duc describes the types of picking systems that are available. By reading the theories from Le Duc’s article, the researcher could investigate the type of picking system at KLG. It might even be possible that companies apply multiple
systems simultaneously within their warehouses. It depends on the situation and the company which and how many systems are used.

- Barry explains why KPI’s are important and also the replenishment process and its importance. The author shows that replenishment is another process which has to run smoothly in order for the inventory management to have the desired results. It was important for the researcher to investigate how important replenishment is in comparison to the other activities within the warehouse e.g. picking and reception. Barry puts emphasis on the replenishment process but it might turn out to be less important than other activities in the case of KLG.

- Jacobs et al and Zimmerman have written regarding the ABC-analysis and its daily application in logistics. Jacobs et al focus more on the mathematical approach of the principle while Zimmerman more on the eventual goals of the ABC-analysis, the fact that products can be grouped in categories. As mentioned above it was important for the researcher to consult multiple sources regarding the ABC-analysis to be able to offer an objective explanation of its application at KLG. The consulted authors regarding the ABC-analysis have different opinions and approaches, which have to be taken into consideration but adapted to KLG’s situation.

- Due to the fact that the transportation activities of KLG are linked to the warehousing activities, it was important to dedicate a section of the thesis to transportation. According to van Weele, there is a standard procedure that occurs during transportation activities. It was important to investigate if this is applicable for KLG, because if transportation disorders occur, they may affect the processes in the warehouse or the total impression of the company in the eyes of its customers. This does not mean that the steps that van Weele mentions in his book are exactly the ones that KLG follows.

- Piasecki and Tompkins have dedicated themselves to the picking process in their works. Thompkins has set the emphasis on the order picker’s time, while Piasecki has mentioned which aspect has to be taken into consideration to have successful picking within a company’s warehouse. It was important for the researcher to take into considerations these ideas and theories and apply them to KLG’s situation. Due to the fact that the picking process has been observed by the researcher, these theories where understood and applied appropriately in order to be able to sketch the picking process at KLG and see how this can be improved.
Chapter 3. Methodology

This chapter contains the methodology which has been used to conduct the research at KLG. The chapter starts with a problem definition and continues with the research methods and ends with the measures that have been taken by the researcher to maintain the quality of the thesis.

3.1. Problem definition

Research objective

It is important to satisfy the customers, remain competitive, while reducing costs. The opinion of the management is that improvement of the inventory management activities is vital in order to achieve this. Therefore the objective of this research is to formulate recommendations for KLG Europe regarding the improvement of the inventory management at their warehousing locations in Bucharest through reduced lead time for operations.

Main research question

How can the inventory management of KLG Europe Bucharest be optimized in order to achieve reduced lead time for operations?

Sub questions

In order to answer the main question, the following sub-questions will be answered:

- What is the current state of the inventory management at KLG Europe Bucharest?
- What is the current state of the lead time at KLG Europe Bucharest?
- What is the current level of the order picking at KLG Europe Bucharest?
- How does the management experience the inventory management activities of the company?
- How do the employees who are involved in the primary processes experience the inventory management activities of the company?

3.2. Research methods

In this section the methods which have been chosen in order to obtain the required results and to answer the main question of the proposal will be presented.

Qualitative research

A research can be either qualitative or quantitative or a combination of the two, depending on the context (Doorewaard & Verschuren, 2010). The researcher has decided to use the qualitative approach for this particular research. The reason to choose the qualitative research instead of the quantitative research is that qualitative research produces a descriptive analysis of the current situation at KLG Europe Bucharest. Furthermore, valuable and in depth information can be obtained through qualitative research.

Case study

To perform a qualitative research, different tools can be applied. For this particular situation a case study method was used to gather qualitative data. A case study has been chosen because “it constitutes of a research method which focuses on observing and investigating specific or complex areas in order to collect information concerning a particular matter” (Flyvbjerg, 2006), in this case the inventory management of KLG Europe Bucharest. According to Creswell (p. 73, 2007); “A case bounded in a time or place should be studied using the case study method.” Documents, records, interviews and observation will be used as forms of data.
Data collection techniques

This chapter includes the data collection techniques which were used during this case study. Data can be collected using primary and secondary sources. Several tools were used to conduct this research; first of all interviews and observations were used as primary sources of information, afterwards desk research was used as a secondary source of data which consist of; internet websites, reports, documents which are relevant to the subject and KLG Europe Bucharest.

Primary data collection

Interviews

Interviews are an important basis of a case study. To gather all the required information, several in-depths interviews with the management and employees of KLG Europe Bucharest were conducted.

General questions were asked to understand who the interviewees are and why they are relevant. Furthermore questions were related to what the interviewees experience as positive and negative during their daily tasks. Also questions were asked regarding the inventory management processes of KLG Europe Bucharest and how the employees and management experience these activities, to see if there are different perceptions towards these activities.

To conduct the interviews successfully it was important to determine the sampling strategy. The strategy which has been chosen in this case is criterion which means that the interviewees meet certain criteria to assure quality of the answers (Creswell, 2007). The interviewees who were selected for the interviews meet the following criteria:

- Only the members of the management which are closely related to the logistics activities were interviewed, for example the Logistics Director.
- Only the employees which are directly related to the logistics activities were interviewed, for example the employees within the warehouse.
- Both the employees as well as the management members have to have at least six months of experience within the company in order to be able to answer the questions appropriately.

Observation

Observation is a very important method in all qualitative researches; it is used to discover complex interactions in the social environment.” (Bernard et al, 2006) In the case of KLG Europe Bucharest, observation was used to understand the inventory management processes, analyse possible issues and give proper recommendations regarding improvements to reduce lead time for operations.

Secondary data collection

Documents

To understand the context/background of KLG Europe Bucharest it was necessary to gather data regarding the company. To be able to offer proper recommendations, desk research regarding the company, inventory management theories, lead time reduction and stock accuracy were conducted. Company documents, reports, internet websites, academic articles and literature were used during this process. The combination of primary and secondary data allowed the researcher to obtain in-depth knowledge of KLG Europe Bucharest and its processes in order to be able to present proper recommendations to the management of the company.
3.3. Measures to ensure the quality of the project

To ensure the quality of the project certain measure were taken during the process:

- **Planning**: a planning has been created beforehand which has been approved by the thesis supervisor as well as the company supervisor and Research Methodology teacher.
- **Halfway check with the Logistics Director (company supervisor)**: The Logistics Director Mr. Paul Niţă has requested a thorough check of the process halfway through the thesis period. A meeting took place to discuss achievements and inconveniences to help the process run smoothly.
- **Weekly check with the supervisor from RBS**: Each week an e-mail was sent to the thesis supervisor Mr. Cadovius to inform him about achievements of that particular week. Furthermore, Skype meetings took place once in three weeks with the thesis supervisor.
- **Close collaboration with the Project Manager**: Thanks to the fact that the researcher was assigned a fixed location within the company, close collaboration with the Project Manager was possible. Valuable information was gained easily as well as questions were asked to facilitate the progress.
Chapter 4. Current state of the inventory management

Chapter four pictures the inventory management of KLG at the moment, this chapter is important because the current state of activities is explained, and it includes desk research which has been conducted at the office as well as field research in the warehouse of KLG.

To be able to offer proper recommendations which will lead to improvements regarding KLG’s inventory management, reduced lead time for operations, the thesis covers the following subjects which are displayed in the Visio diagram:

The inventory management is built up by three main activities and the control process:

1. **Inbound**
   - According to the specialized management portal MBA Skool an ABC-analysis can be used for “the optimization of the inventory management of a company.” The inventory can be categorized in three categories which differ in importance and value:
     - A items: very important, accurate records and very tight control necessary
     - B items: less important, decent records, less tight control necessary
     - C items: marginally important, only essential records, light control (2013)
   - According to the specialised website Investopedia (marketing, trading, finance etc.); “stock keeping units (SKU) are used to track efficiently the numbers of individual variants of products/services sold or remaining in stock.” (2013) The SKU’s at KLG can be divided among shelves, racks and bulk.
   - Checking: regarding the checking process it is important to know who will take care of this and how long it takes for the checking process to take place.

2. **Replenishment**
   Products are being taken off the shelves and lowered to the picking area where a certain amount of products is being selected from the pallet to complete the order. The rest is left in the storage location or moved to another storage location to optimize the use of space. Replenishment is important because if it is not executed correctly, the picking process will suffer; lack of products within the storage areas, loss of time and money, and inconveniences with customers.

3. **Picking**
   Once the products arrive at the picking area, they are being selected according to the demand and prepared for distribution. E.g. a pallet has 5000 products, but 4999 are being ordered. This means that the pallet is being taken out of the storage location, 4999 products
are being selected while one product returns to the storage location or if necessary left “in time”. In time are products which have been lowered from the upper storage locations for replenishment, and are placed at the front and outside the normal storage locations. Pickers must pick products from the in time locations in order to get rid of these products as soon as possible.

If a full pallet is being ordered, the picking process is being skipped and the entire pallet gets scanned and prepared for transportation. The picking process must be as efficient as possible, this is where KLG can exceed customer expectations and reduce lead time for operations the most, which can have huge impacts on the companies’ results.

4. Control
The control phase consists of stock locations, time (when are they stored and how long), when does checking take place (cycle count), what % of accuracy is being achieved per customer.

4.1. Type of 3PL provider
“3PL’s providers can be categorized as transportation based, distribution based, forwarder based, financial based and information based.” (Coyle, Novack, Gibson, Bari, 2011) KLG belongs in the distribution based category, because the company offers logistics activities such as inventory management, warehousing and order fulfilment and also transportation services. (Coyle, Novack, Gibson, Bardi, 2011) Because of the combination of transportation and distribution services, KLG can offer a complete solution to its customers. This allows its customers to collaborate with a single 3PL provider. (Coyle, Novack, Gibson, Bardi, 2011).

According to Coyle, Novack, Gibson and Bardi; a 3PL provider, similar to KLG, should deliver seven services:
1. Provide visibility of inventory status, also during transit;
2. Measure performance and provide reporting;
3. Create a low-cost network while delivering quality;
4. Offer multimodal options to plan, manage risk of running out of inventory by alternating modes, varying transit times and selecting carriers;
5. Develop internal and industry rate benchmarks;
6. Conduct constraint-based bids to optimize price and constrain carriers to maintain the quality level high;
7. Establish reliable transit times, on-time delivery and effective carrier management.” (p. 397. 2011)

KLG is one of the best 3PL providers of Romania and the company invests greatly in state of the art equipment and services. KLG has established a decent name and reputation on the Romanian market; this is why quality is very important for the company.

4.2. Inventory management
According to Kotler (2000); “inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work-in-progress) and finished good so that adequate supplies are available and the costs of over or under stocks are low.” (As cited in Adeyemi & Salami. p.136, 2010) The inventory management of KLG is being influenced by inbound, replenishment and picking. These three categories have to be checked and controlled because together they determine if the inventory management of KLG is working correspondingly or not.

According to Adeyemi and Salami; “The principal goal of inventory management involves having to balance the conflicting economics of not wanting to hold too much stock. Costs
have to be monitored regarding storage, spoilage, pilferage and obsolescence" (p. 135, 2010)

According to Denise Loter-Koch; inventory is necessary to avoid long waiting time and to satisfy the consumer’s demand. Due to categorization of products a company can know which products are popular and sell the most. Computerized inventory management, as in the case of KLG, can streamline the inventory and lower costs. Furthermore by having a good inventory management, trends can easily be tracked if sales (frequency that the products rotate) are monitored correctly. (2011)

According to Napolitano there are some important guidelines to improve inventory management;

1. “Consider inventory optimization tools” that use data from WMS and ERP to determine how much inventory to hold.

2. “Don’t treat all SKU’s the same,” monitor closely which products are A category, which ones B category and C category. Focus mainly on the 20% of the products that make up 80% of the volume. It is also important to be smart with the slow-moving and obsolete items. Reconsider if these products should be in the assortment or not and communicate this to the manufacturers.

3. “Keep an eye on your suppliers” and monitor their activities closely. KLG uses WMS which helps to identify unreliable suppliers or transporters.

4. “Track essential attributes” e.g. country of origin, serial numbers, and vendor lot number, in order to anticipate and react appropriately to inconveniences.

5. “Slotting must be taken into consideration,” finding the best location for the products within the warehouse. This is something that KLG is doing already but not for all the customers. A good example where improvement is strongly required is Akzo Nobel, where relocation of the products is necessary to improve order picking efficiency. (2013)

4.3. Stock accuracy

According to Lee; “stock accuracy is a measure of how closely official inventory records match the physical inventory.”(p. 1. 2006) The stock accuracy at KLG can be divided in individual SKU’s; shelves, racks and bulk. The accuracy of these individual SKU’s is measured for each customer, product and area. (2006)

If the accuracy of the stock is not high, more capital is required to remedy the situation. Some important financial reasons for a high stock accuracy are; investor’s interest and taxation. Investors want to know that the company is doing well while the taxation of the company’s income relies on the stock accuracy. Some operational reasons are; delays in orders can occur, missing items, wasted time and labour if the stock accuracy is low and due to inventory auditing. At KLG the inventory auditing takes place monthly, once in half a year or yearly, depending on the customer. (Lee, 2006)

Reasons for inaccuracy according to Lee are process related errors and volume related errors. To improve the accuracy; cycle counting, physical inventory, process improvement and transaction reduction can be applied. To remove errors, cycle counting and physical inventory are suitable, while preventing errors needs process improvement and transaction reduction. (2006)
4.4. Lead time for operations

According to Jacobs et al: “lead time is the time from ordering to receipt.” This means the time that it takes for a product to be ordered and delivered to the end customer. In the case of KLG lead time can be divided in two possibilities:

1. The amount of time it takes for a certain product to be transported as well as all the logistical processes that take place from the moment and order is being placed by a customer, until the product reaches the end customer.

2. The amount of time it takes until an order is being prepared for departure from the warehouse of KLG until the moment it actually leaves the warehouse, lead time for operations. (2011)

In this case the second option is the lead time that matters most for KLG and which will be investigated during this thesis.

According to Rajaniemi; “lead time in general can be divided in five different categories:

1. Order lead time; this is the time it takes for a product to be delivered to the end customer from the moment it has been ordered.

2. Order handling lead time; the time it takes for a sales order to be created from the moment an order has been received.

3. Manufacturing lead time; the time it takes for a product to be finished from the moment the sales order has been created.

4. Production lead time; the time it takes for the product to be finished from the start of the physical production.

5. Delivery lead time; the time it takes for a product to be delivered from the moment that production has been finished.” (Lead Times, 2012)

KLG’s lead time can be divided into three categories depending on the customer.

1. Order handling time; once an order is being placed by a customer, KLG has to process this into the system (VBS) in order for the preparations in the warehouse to commence.

2. Operations lead time; includes the time it takes for a product to be ready for shipment from the moment it enters the warehouse. Operations lead time consists out of all the processes that take place within the warehouse of KLG. The loading and unloading of the products are KLG’s responsibility. Once the doors of the trucks open, KLG is responsible, unless the products have been damaged during transportation.

3. Delivery lead time; the time it takes for the products to be delivered to the customers from the moment they leave the warehouse at KLG. Depending
on the customer, KLG can deliver the products by using its own trucks or contract other companies to take care of the transportation. It is also possible that the customers take care of the transportation themselves.

4.5. Customers

Thanks to the expertise of KLG, the company can offer complete packages for its customers depending on their needs. Besides the basic handling services which a 3PL provider offers, KLG also included value added services to increase its services portfolio, see paragraph 4.8 Value added services.

KLG has different customers from different sectors, both from Romania as well as internationally, some examples are: Adidas, 3M, Orange, LG, Red Bull, Wrigley, Akzo Nobel, Ericsson, Bunge, Coty, Euralis, LC Waikiki. Smaller customers are: Cramele Recas, Valvis, Intervision, Nod (Network One Distribution), Elko, Aectra. At the entrance of KLG, a monitor displays live the:

- Amount of active orders;
- Orders in progress;
- Orders prepared;
- Active Order Lines*;
- Order Lines in progress;
- Prepared Order Lines.

* Order Lines is the amount of articles than an order includes with different article codes.

This monitor is linked to the WMS and keeps the employees up to date with the status of the processes within the warehouse.

Orange and Adidas have different storage areas within the warehouse which are separated from the rest. The other customers either have their products stored in bulk or in the storage locations. A01 until A64. The warehouse layout of KLG can be viewed in figure 15.

The storage areas of Orange and Adidas have been created because all their products intended for Romania are stored here, so there is a high amount and variety of (expensive) products in one location. Furthermore these two companies are very important customers and a separate storage area was necessary to be able to perform efficient picking and keep them satisfied. These two companies have outsourced their storage and transportation activities completely, which makes them dependent but also decreases their costs because they can focus on their main activities. It becomes KLG’s task to offer efficient inventory management which leads to process optimisation whilst reducing costs as much as possible. Orange and Adidas have delegated employees at KLG which monitor and report the way in which KLG handles the processes it executes for these companies.

At Akzo Nobel, two different criteria are important for the products and storage area; the lot number and the validity date. The Akzo Nobel warehouse area used the LIFO (Last in first out) system for its products but this changed to FEFO (First expired first out) in order to reduce the amount of inventory and errors. Products that have the soonest expiry date have to leave the warehouse first.

Both Akzo Nobel as well as Euralis are seasonal companies that sell a high amount of products during a certain time of the year. In the case of Euralis, the company sells the most in November, December and January while having three months per year with barely any activity.

Depending on the customer, KLG has signed contracts and arranged terms and conditions regarding the inventory management. In some cases the inventory management is custom
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handled by KLG, in the cases of Adidas, Orange and in the near future Coty, while the rest of the customers have normal storage locations. Regarding the mentioned companies above, company representatives are present in the warehouse while for the other customers only KLG personnel is responsible. The customer pays either for the entire service from order placement until arrival at destination, or solely for some services. If a certain customer only uses cross docking, he will only be charged for that kind of product handling while storage costs will be 0. (Except when products for cross docking have to stay at KLG for longer than 24 hours)

The administrator checks daily the replenishments and the orders to maintain control and structure within the warehouse. Yearly, each six months or monthly a thorough check is executed in collaboration with the customer, to point out discrepancies between the system stock and physical stock. The upper levels of the storage areas are nearly flawless, while the main problems occur in the lower levels. The accuracy within the locations is vital in order for the system to run properly.

The picking process can either be manual or electric depending on the product and weight. If products are not too big or heavy, a picker can manually pick them and prepare them for departure in comparison to large and heavy products which have to be picked electrically.

KLG’s priority is to handle a customer’s inventory management as good as possible, to have a good product flow and keep costs as low as possible. The reputation of the company is very important and it is vital to consolidate and maintain good relationships with its customers.

It is convenient for customers such as Orange, Adidas and Coty to outsource their entire warehousing and transportation services to KLG, due to the fact that costs can be reduced and full concentration can be granted to their main business activities. These customers pay for the entire package of services and benefit from the fact that KLG has a large services portfolio. For KLG it brings along prestige to have such clients in their client portfolio, but the company does commit to the fact that it carries responsibility for the entire stock.

Furthermore it was necessary to create and assign special warehouse locations and employees to these projects. This makes it necessary for KLG to be flexible and adapt to the client’s needs and wants. Akzo Nobel or LG, use the bulk area as storage or the normal storage locations. These clients are important as well, but because of the fact that the products are larger and heavier than the products of Adidas, Orange and Coty, it was not necessary to assign separate storage locations within the warehouse. KLG focuses on pleasing the customers as much as possible, even if sometimes it might be detrimental for the company.

For the customers, outsourcing the activities that KLG is specialised on brings along advantages and leads to optimal processes for them. In the case of KLG, sometimes the company has to give in more than it receives and be flexible in order to please the customers and not lose them.

Even if Orange, Adidas and Coty are not the most revenue generating clients, KLG tries to keep them in the client portfolio. Clients as 3M and Domo generate far more revenue than these clients and furthermore their services can be handled easier. Another good example of a client which needs less “attention” is Euralis which due to its seasonal activities does generate good profit for the amount of work that KLG puts in. Only a couple of employees are needed to handle the inventory management of this client. For Adidas, Orange and Coty, many employees and activities are needed to manage their inventory. Red Bull has generated low revenue during the first year, KLG was running nearly break even regarding this client. Still the company did its best to please Red Bull and have them in the client portfolio.
4.6. Computer systems

KLG uses several computer systems in order for the operations to run smoothly and efficient. For the Electronic Data Interchange (EDI) and the Warehouse Management System (WMS) KLG has contracts with Van Boxtel (VBS), which is a Dutch company, and regarding the Transportation Management System (TMS), KLG has contracts with the Dutch company GreenCat. The goal of these systems is to create and maintain a good and fast communication between KLG and its customers, suppliers of goods and improve the efficiency of the processes and supply chain.

EDI

The electronic data interchange system of VBS, makes exchange of data flow smoothly, fast, efficient and effective between KLG’s systems and customer’s systems. Orders, receipts, corrections and stock levels are transferred automatically through the system without human interference or mistakes. According to the official Van Boxtel website: “The advantages of EDI are:

- Cost reductions;
- Increase in speed;
- Quality improvement;
- 100% mistakes prevention;
- Forms a platform for tracking & tracing;
- All processes are integrated in one system”. (2013)

WMS

The warehouse management system of VBS, allows the automation of the product flows in order to reduce administrative actions, prevent time and capital loss due to unnecessary product movements and takes care of error deliveries. The employees within the warehouse register the incoming and outgoing products immediately through a scanning system. All the relevant information is being registered instantly. According to the Van Boxtel website; “The advantages of WMS are:

- Less administrative actions;
- Productivity improvement;
- Quality improvement;
- Different picking strategies;
- Insight in the progress of processes;
- Management of processes;
- Fast implementation (3 months);
- 24/7 support." (2013)

TMS

The Dutch company GreenCat (Groeneveld company) supplies KLG with its Transportation Management System. The GreenCat programme consists out of RoadRunner and Visual Planner.

RoadRunner+

According to the official GreenCat website; The RoadRunner + programme allows logistic automation and takes care of order management, scheduling, invoicing and fleet management. Reliable reports help the company to react properly. (2013)
Visual Planner

According to the official GreenCat website; “this programme allows the planner to gain the most from each transport order. The optimum route is being calculated and drivers can receive all orders in the correct sequence if on board computers are installed.” (2013)

Companies have made significant improvements, benefits and savings thanks to the use of EDI or other system-to-system exchanges. Manual work as well as administration can be reduced thanks to these systems. Productivity increases which leads to expansion while avoiding the usual associated costs. (Ford, 2007) The personnel at KLG use all these systems to be able to offer good services, but investments and training were necessary.

4.7. Warehouse services

The entire working period during a day at KLG is between 7:00 and 21:00. The warehouse employees start their activities at 7:00, while the office employees start at 9:00. In figure 13 the division of the daily activities is displayed. During all these processes it is important to coordinate appropriately and use the personnel as much as possible during the 12:00 and 16:00 interval when employees from both shifts are present within the warehouse.

![Figure 13 Warehouse daily activities](image)

Picking

At KLG the order picking process is done manually, manual order picking operation, the pickers walk or drive using warehouse machinery to collect the products from the storage locations which correspond with the order specifications. Besides the manual order picking operations, the pickers perform multiple picking which consists of handling multiple orders at the same time to improve efficiency. The collected items are placed on a pick device and the picker continues his route which is transmitted by the VBS system. (Roodbergen et al, 2008)

![Figure 14 Classification of order picking systems](image)
According to Le Duc: “There are many different order picking system types in function within warehouses, multiple order picking systems are applicable in one warehouse.”(p. 4, 2005) In case of KLG the picker-to-parts system is the one in function, where the picker walks or drives along the aisles to pick the corresponding items. In figure 14 the different order-picking systems are displayed which are divided among manual and mechanized/automated. (De Koster, 2004, Le Duc, 2005)

Cross docking

“Cross docking is a logistical solution which brings along improved efficiency and cost reductions. Goods are being moved to the outbound dock directly from the inbound dock, instead of storing the goods. The transit time of the goods is being reduced significantly which improves the customer service.” (Intra logistics website, Inther, 2013)

KLG uses cross docking in combination with the FIFO system, e.g. at Adidas, where some incoming products are leaving immediately. Once the products arrive at KLG, they are prepared for departure instead of storing them and this leads to reduced costs for the customer and an improvement of efficiency. At first glance it might not seem profitable for KLG, but it contributes to the satisfaction of the customers which can lead to long-term business relationships. Furthermore, by offering cross docking services, KLG has increased its services portfolio.

Groupage

According to the description of one of the employees at KLG: “Groupage is the process where complete orders or parts of them are being combined with other orders and have the same destination. The goal is to improve efficiency of the flow of goods.” (2013)

Within the warehouse of KLG groupage activities take place in one of the sections. Large orders arrive at KLG and the groupage activities commence. These products are being “grouped” and prepared for different destinations. This means that the received orders are being divided into smaller orders and combined with other products in order to prepare new orders for different customers and locations.

Zoning

According to Mengfei (2008); “Zoning consists of dividing the entire pick area into a number of smaller areas/zones with one or more pickers assigned to each zone for picking the required items stored in the zone.”(p. 7-8) The major advantages of zoning include familiarity of each picker with his/her zone, shortening travel distance (thanks to smaller traversed area), reducing congestion and the ease of administration and control (De Koster and Yu 2007; Jane and Laih 2005; and Petersen 2002). The area of KLG is divided in zones with different pickers; e.g. for Adidas and Orange where fixed teams operate. This will also be the case for Coty.

Order Batching

“Order batching consists of the process of grouping customer orders together and jointly releasing them for picking.”(p. 17, Mengfei, 2008) Thanks to batching, productivity can improve because of the reduction in order picking travel time. (Mengfei, 2008) A picker does not need to travel through the warehouse for one single order; he can now complete several orders with a single trip which saves travel time per pick. Order batching is being applied KLG, a good example is Orange. The pickers collect products for multiple orders at the same time instead of one individual order at a time.
Storage assignment

Storage assignment takes place before the start of the picking process; the received products are being stored according to certain rules. The forward area and the reserve area may differ per customer. Products can have different positions and priorities in the warehouse. By using storage assignment the time that it takes for the products to be picked when necessary can be reduced. (Mengfei, 2008)

Storage assignment can be either random or dedicated, whereby random storage assignment uses all the available storage locations, which leads to higher space utilization in comparison with dedicated storage assignment where each item has a fixed storage location in the warehouse. (Mengfei, 2008) KLG uses a fixed storage location for each customer and product. These storage locations have been calculated and selected by VBS. It does happen that sometimes products are being moved from one location to another; but this includes mostly the entire assortment and the new location has been selected to improve efficiency. Efficiency improves because the previous location can be used for other products which are more suitable for that particular location.

Routing

During the order picking process, “routing determines the visit sequence for order pickers to pick multiple products on the pick list.” (p.22, Mengfei, 2008) Routing takes place at KLG during the picking process, the VBS calculates the best route for a picker to take to save time and avoid congestions.

Sorting

Multiple orders are being picked together at KLG, which makes it necessary to use sorting. The right products must be selected and placed in the sorted location. The sorting can be performed during or after the picking process. “The item extraction time is lengthened if sorting is being performed during the picking process, while for sorting after picking a separate downstream sorting system is required.” (p.23, Mengfei, 2008)

Congestions

According to Gue et al (2006) “Congestions can be defined as the percentage of time pickers are blocked in a warehouse, during a picking process.” (As cited by Mengfei, p. 25, 2008)

Congestions at KLG’s warehouses should not occur at all because the system takes it order by order to avoid such situations and sends one picker to collect multiple orders if necessary instead of multiple pickers. The system also starts with the furthest route (route the products need to travel) first and ends with the nearest (Bucharest).

The pickers use trolleys which fit next to each other so congestions, ‘the possibility for pickers to get stuck during order picking’, rarely occur. If during the picking process certain actions or procedures are not followed, congestions due to human errors may occur.

4.8. VAS (value added services)

KLG offers its customers complete services which are adapted to their specific needs. Besides the transportation, customs, storage, logistics and distribution services, the following VAS services are offered;

- Packaging
- Repackaging
- Kitting
- Labelling
- Assembly (author Prezentare VAS, 2013)
Value added services are extra costs for KLG but also enlarge the services portfolio of the company. This enables KLG to offer complete solutions for its customers and improve the company’s position on the market.

4.9. KLG’s logistics revenue

KLG divides its logistics services into three categories:

1. Receptii (Romanian) - Receptions
2. Comenzi (Romanian) - Orders
3. Depozitare (Romanian) - Storage

The handling services consist out of all the services that include the “movement” of the products and can be divided among handling in and handling out. Handling is the most important activity because this is the area that generates the largest part of the company’s margin but also brings along the highest costs.

The main cost categories of KLG are:

- labour budget (including taxes, meal tickets and transportation);
- warehouse machinery (forklifts, reach trucks, VNAs, electric transporters, etc.);
- operational hardware (servers, Wi-Fi terminals, computers);
- materials (wrapping foil, scotch tape, wooden pallets).

The storage part is also very important to KLG because it implies a large amount of costs (rent, utilities, maintenance). On this activity KLG is focused on covering the costs instead of generating margin. The storage of goods is the basement of all KLG’s handling processes because of the following two reasons:

1. **Inbound** activity is considered finished at the moment of placing the goods in the storage area; for this activity the warehouse layout and the distances between docks and storing location make the difference between an effective process and a burden; an accurate inbound activity offers a high level of accuracy in the inventory.

2. **Replenish** from storage to picking represents at least half of the internal goods movement inside the warehouse, activity which is not charged to any customer; this means that all replenishment movements are done on KLG’s cost and they have to be as minimum as possible; a good storing layout minimizes the extra-movements and in the end leads to lower costs. Replenish is a movement of goods but is billed within the finance of the company as an outbound process.

Picking is an outbound process which is part of handling and brings approximately 75% of KLG’s handling income. The productivities in this area are well analysed and measured to minimize time, distance and materials; having an accurate inventory and a good warehouse layout, KLG can perform the picking with low costs for its customers.

The transportation services are being taken care of by different departments which are divided among internal (Romania) and external (rest of the world).

4.10. KPI’s

An official definition of key performance indicators according to Coyle, Novack, Gibson and Bardi is: “measures that are commonly used to help an organization define and evaluate how successful it is, typically in terms of making progress towards its long-term organizational goals.” (2011, page 488)
Key performance indicators (KPI) are important because the satisfaction of the customer depends on them. If KLG achieves 100% regarding the following KPI it means that there are no errors regarding:

- Stock accuracy
- Stock performance management

Key performance indicators differ per customer, the percentage of stock accuracy and stock performance management depend on the size of the customer, quantities and the frequency of the orders.

According to Coyle, Novack, Gibson and Bardi, other KPI's for logistics companies are; in-stock inventory, inventory turns, and on-time delivery. (2011).

The Adidas example in table 1 shows the KPI for this particular customer.

The performance of the stock management shows the amount of stock that was without; damages, flaws.

The second KPI is the stock accuracy per location, which shows the differences between the stock locations vs. the article that should be in place.

For the first KPI the target that KLG wants to achieve is 99,99% while the minimum achievable % is 98,00% and with a critical value of 97,00%.

Regarding the second KPI, the target is 99,98% while the minimum achievable % is 98,00% with a critical value of 97,00%.

It is important for KLG to have consistent and measurable KPI's to be able to measure costs, productivity and efficiency. (Barry, 2013)

### 4.11. Layout of the KLG warehouse

The warehouse of KLG can be divided into eight sections to create a better understanding of the areas. These eight sections will be explained from right to left and are displayed in figure 15 on the next page.

Section 1 and 2 are storage areas which consist out of big storage locations with only areas and levels and no sections. The amount of levels of these storage locations is six floors. The rows are numbered with A01 until A23.

Section 3 consists out of groupage products as well as bulk products. The groupage section is located in the front of the area while the bulk area is located at the back. The groupage area is divided in the number of hubs that KLG possesses in Romania. The hubs that KLG has are; Băcău, Constanța, Cluj, Timișoara, Craiova and Brașov. On the right side of the groupage area, the desks are located from where the warehouse keepers take care of the
bulk products. If bulk products are placed in the groupage area the same warehouse keepers are responsible for those products.

Section 4 is the section intended for Orange. A detailed warehouse layout of Orange can be viewed in figure 16. The warehouse area of Orange consists of the rows A36 until A43.

Section 5 and 6 are storage areas which also consist of big storage areas with different products, depending on the customers. The areas continue after the Orange section with A44 until A64.

Section 7 is a large bulk area where different products from different customers are stored, mostly 3M, LG and Domo products.

Section 8 consists out of two areas; the front area has bulk products while the back area is reserved only for Adidas. The Adidas storage area has locations which are noted with B01 until B15 and has a ground floor storage area as well as three upper floors. The storage system at Adidas is separate and more sophisticated and shows some similarities with Orange. The areas at Adidas also include smaller sections which increase the number of storage areas but also the complexity of the picking process. (Warehouse layout KLG, 2013)

**Bulk**

Bulk products consist of products which are too big to store in the normal storage areas. Examples are washing machines, refrigerators, freezers, furnaces etc. These products are stored in the bulk area to optimize space and leave the normal storage locations open for smaller products. Furthermore unloading and loading is facilitated because these products are placed on the ground instead of in the upper levels storage areas.
Figure 15 Warehouse layout Bucharest
4.12. Orange warehouse layout

Orange possesses an area within the warehouse of KLG which contains fences to keep the Orange and other sections of the warehouse separated from each other. The Orange area has an entrance which is formed by a sliding gate which can be opened during the day.

On the left side after the entrance, a trash area can be found where mostly empty boxes are located. On the right side, the area can be found where finished orders are checked and prepared for departure. This area consists out of conveyor belts where the orders are placed on by the pickers once an order is completed; afterwards the products are being checked once again. Orders are being placed in boxes and in some cases, small orders, in envelopes. Desktop computers are located in this area in order for the employees to confirm the orders in VBS.

The pickers place the products into boxes and number them according to the number of boxes that an order consists of. This enables the employees that check and prepare the orders for departure to know how many boxes the order consists of and print the appropriate shipping labels.

On the left side of this area, the warehouse managers of Orange have their desks, this is where they control the area from. They can communicate with the employees at any time if some changes in the warehouse occur.

In front of the rows 43 until 36, the “in time” section is located where pallets with products are being placed after they have been taken down from the upper levels of the storage locations. The goal is to have as few products “in time” as possible.

The warehouse employees use forklifts to take products down from upper levels or to lift products for storage. Furthermore they use manual pallet jacks to transport pallets or heavy load. The pickers use trolleys to move around the aisles to pick the products.

The rows of the storage area are numbered from 36 to 43 starting from right to left. The first rows contain accessories, the next rows telephones and the last rows sim-cards and prepaid scratch cards. Each row is divided in areas which start from 1 at the front of the areas and go to the back. Each area consists of levels; 0 for “ground floor”, 1 for the first floor and etc. For small products the areas are divided into smaller sections; for example 1,2 or 3 sections.

An example of a location can be: A43-15-02-01 (row, area, level, section (if applicable)). The amount of levels in height is six.

At the back of the Orange warehouse, the returns and receptions area is located. The returns area includes all the products that are returned to Orange. The returns have to be processed and placed into the storage area as soon as possible.

The receptions area handles all the new products that arrive at the Orange warehouse location. When new telephones arrive for the first time, a sample is being selected randomly and checked by the employees responsible for the receptions. The results of this evaluation are filled in digitally and sent back to Orange.

Next to the returns and receptions area, a separate storage space has been installed where for example damaged goods and tested units are being stored.
Batches

The separate storage area at the back of the Orange warehouse area is divided into the following seven batches with number codes:

1 - CWH: new and sealed products which are ready for delivery.
2 - SWAP: products which are intended for customers, which have products sent for repair.
3 - SWAP DMG: products which were intended as temporary replacements and got damaged.
4 - ON HOLD: products that contain flaws according to official requirements.
5 - DOA (Dead on Arrival): products which are complete but not functional are returned to Orange.
6 - DMG (Damaged): products which cannot be repaired or replaced.
7 - SH (Second Hand): products which cannot be reintegrated into the warehouse of KLG due to non-conformation of requirements.

Stock transfer

Stock transfer consists of “moving” products from a batch category to another depending on the events within the warehouse. For example; if a product gets damaged it may be put on hold until the problem is solved, afterwards the product will be moved back to CWH which means ready for reintegration in the storage locations. This change of category has to be communicated to the VBS system which will transfer the information to the client’s system in order to keep them up to date with the status of the product.

Stock balancing

Each day at 6:50 am, KLG sends through EDI to OA (Oracle) a notification with the stock level at that current time. OA compares the stock level sent by VBS with its own stock level. If differences occur, the Stock Control team of Orange will send an e-mail to KLG with an attached file that contains the stock levels in these two systems; OA and VBS. Once the document has been received, KLG and Orange will investigate the stock differences. A maximum of three days has been set as a standard to solve these stock issues, from the moment the e-mail from Orange has been received. Stock balancing makes sure that the stock transfers have been well performed and communicated to the client’s system.

Replenishment

A pallet is being brought down from an upper shelf (it does not return to the upper level anymore) and replenishment commences. Thanks to replenishment, the pickers are able to collect the necessary products to complete the orders.

In time: pallets, products are being brought to the front of the warehouse due to lack of space. Picking can be performed from these locations to reduce the amount of in time products.

At the end of the day the orders are being scanned again to check if everything corresponds and the data is entered in VBS.

According to Barry; it is vital to make sure that a picker has sufficient products available to prepare orders and this rule is often broken. If replenishment does not flow smoothly, this can lead to inefficient productivity. (2013)

Picking

Using the scanning system, pickers wear portable scanning units to execute their picking activities. The system shows the picker where to go and what to get. If a picker scans the
wrong code or label, the system will automatically display an error. This makes it close to impossible to make mistakes while using this system. It is very important to always check the total amount of products that has to be collected to make sure that no mistakes have been made during the picking process. The P1 button on the portable scanning units is the button that confirms a complete picking process.

The picking process includes several different kinds of labels and codes:

- DPU number (shows the order number)
- Label on the pallet
- Label on the rack in the storage area
- Product label (check if the right products has been picked out of the box, of the pallet or shelf)

**Movement of goods in order to free space**

If a storage location has only a couple of products left in a box which occupies an entire pallet location, these products have to be moved to smaller shelves to free space.

To confirm and execute this movement the picker has to scan the location where the products are at the moment (this will show how many products are left at the moment), afterwards check the label on the pallet and introduce it manually at "MOVEMENT" to show that a movement will take place. Afterwards the products are physically moved and the new location is scanned and confirmed in order for the movement to be completed.

---

Figure 16 Orange warehouse layout
4.13. Warehouse safety regulations

- KLG organizează, periodic, teste, prin care se verifica gradul în care angajatii KLG și-au însusit prevederile Manualului Sistemului de Management Integrat, Procedurilor Sistem și Procedurilor de Lucru, normelor și reglementărilor programelor de securitate existente.
- Vizionarea înregistrărilor sistemului de supraveghere este efectuată de către personal specializat prin sondaj sau în cazul unor incidente.
- Conform reglementărilor în vigoare și “Planurile de urgență” elaborate de KLG, personalul este instruit cu privire la modul de acțiune în situațiile de urgență: calamități naturale, incendii, evenimente chimice.

Figure 17 Safety regulations (Romanian)

KLG organizes periodical checks to test if the employees have been complying with the regulations regarding safety. Surveillance cameras are being monitored by trained personnel to avoid theft, accidents or other inconveniences.

The employees of KLG are up to date with the rules and regulations stated in the “Emergency plans” which become active in case of emergencies; natural causes, fires, chemical accidents.

Official regulations according to company documents

- Enforcement of the 319/2006 safety and health regulations law during work, methodological rules of application of law 319/2006 GD (governmental decision)
- Risk evaluation; prevention and protection plan; annual instructions of health and security which are specific for the working environment
- Health checks of the employees according to the signed contract between parties, annual health check.
- Training; general introduction at the beginning of the employment, at the workplace, periodical training, retraining (once an employee has been absent for 30 working days)

Authorisation of the electrician, stoker, fork lifter, shunter is obligatory and granted by the ISCIR.

Reports of accidents/incidents have to be done at the ITM (Territorial working inspector) which depends where the warehouse is located. In case of KLG, the warehouse belongs to the municipality of Giurgiu. (KLG safety manager, 2013)
4.14. ABC-analysis

Villefredo Pareto, the inventor, of the Pareto principle came to the conclusion that 20% of the people owned 80% of the wealth. This principle is used daily in decision making, logistics etc. Because inventory nowadays consists of many different items, the ABC inventory classification divides products within a warehouse according to importance. (Jacobs et al, 2011)

The ABC-analysis can be used to group the products according to the rotation speed within the warehouse. The rotation speed means how fast these products sell and enter/leave the warehouse.

- A products are placed at the front of the row, near the loading area
- B products are placed after the A products
- C products are placed after the B products, at the back of the storage location (Zimmerman, 1975)

To be able to perform an ABC-analysis it is important to have several criteria. In the case of KLG the following three criteria are necessary for an appropriate ABC-analysis:

1. Order lines
2. Pieces of products
3. Volume/weight

Depending on the client, the priority of the criteria can be different. In the case of Orange, the order lines have full priority. Because of the fact that Orange sells mobile phones, SIM cards/credit scratch cards and accessories the amount of pieces and volume are not important in comparison to the amount of order lines. The order lines are the criterion that the Van Boxtel system uses to calculate the routes as well as the storage locations for the different products.

To optimize the stocking locations and reduce the distance that the pickers have to cover during picking; the product must be stored according to several criteria:

- the rotation frequency of the products;
- the characteristics of the products;
- accessibility in the warehouse. (Official logistics course, 2012, Supply Chain Management Centre Romania)

In figure 18, the ABC-analysis graph explains the correlation between 20% of the products and 80% of the sales. The line grows from 0% to 80% for the cumulative amount of sales with only 20% of the cumulative products which make up the A category of products. Afterwards the line continues from 80% to around 93% with another 20% of the cumulative amount of products which are the B-category products. The C category consists out of the remaining 60% of the cumulative amount of products and which make up for around 7% of the total sales.
Orange
Average volume per order = 0.05m³ = 50,000cm³
Average order lines = 15
Average volume per one order line = 0.0033m³

For Orange, the volume is not important because:
- average volume per order: 0.05m³
- average weight per order: 5kg

Having in mind, the best way to pick is to perform multi-order picking. According to the website of Van der Inde which is a company specialised in warehouse automation; Multi-order means picking multiple orders at the same time, in case of KLG a picker can pick between 12 and 30 orders simultaneously. (2013)
Products with small volume and weight (that fit in a box figure 20) are best calculated in ABC by order lines.
Big products (washing machines, refrigerators, etc.) cannot be calculated only by order lines, the volume/weight as well as the amount of pieces has to be taken into consideration.

In the case of Domo, the priority of the criteria is different. Domo sells appliances; refrigerators, washing machines, vacuum cleaners etc., which are heavy and voluminous products. In this case the amount of pieces can be relatively small in comparison to the amount of pieces for Orange products, but the volume is considerably bigger.

The priority of the order lines has decreased because the system must take into consideration the amount of pieces but also the volume to calculate the best stocking location as well as picking route. The reason for these criteria and priorities is to avoid the possibility for the picker to be forced to collect heavy products from the end of the warehouse and bring it all the way to the front for loading.
When an order is being collected by the picker, it is important to be “smart” to avoid unnecessary inconveniences and loss of time.
In the following ABC-analysis, Orange will be used as an example:

<table>
<thead>
<tr>
<th>Lines</th>
<th>Pieces</th>
<th>Volume/Weight in m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Domo</td>
<td>50%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 2 ABC-analysis priorities

Order lines Orange

<table>
<thead>
<tr>
<th>Product</th>
<th>Order lines</th>
<th>Formula</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flyers</td>
<td>10000</td>
<td>(10000/200.000)*100%</td>
<td>5,00%</td>
</tr>
<tr>
<td>2. Stickers</td>
<td>9873</td>
<td>(9873/200.000)*100%</td>
<td>4,94%</td>
</tr>
<tr>
<td>3. Sim</td>
<td>8100</td>
<td>(8100/200.000)*100%</td>
<td>4,05%</td>
</tr>
<tr>
<td>4. Scratch Cards</td>
<td>7348</td>
<td>(7348/200.000)*100%</td>
<td>3,67%</td>
</tr>
<tr>
<td>5. Cases</td>
<td>6500</td>
<td>(6500/200.000)*100%</td>
<td>3,25%</td>
</tr>
<tr>
<td>6. Headphones</td>
<td>5389</td>
<td>(5389/200.000)*100%</td>
<td>2,69%</td>
</tr>
<tr>
<td>7. USB cables</td>
<td>4587</td>
<td>(4587/200.000)*100%</td>
<td>2,29%</td>
</tr>
</tbody>
</table>
### Table 3 Order lines Orange per year

<table>
<thead>
<tr>
<th>Product</th>
<th>Pieces</th>
<th>Formula</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flyers</td>
<td>100.000</td>
<td>(100.000/2.000.000)*100%</td>
<td>5.00%</td>
</tr>
<tr>
<td>2. Stickers</td>
<td>90.000</td>
<td>(90.000/2.000.000)*100%</td>
<td>4.50%</td>
</tr>
<tr>
<td>3. Sim</td>
<td>80.000</td>
<td>(80.000/2.000.000)*100%</td>
<td>4.00%</td>
</tr>
<tr>
<td>4. Scratch Cards</td>
<td>70.000</td>
<td>(70.000/2.000.000)*100%</td>
<td>3.50%</td>
</tr>
<tr>
<td>5. Cases</td>
<td>65.000</td>
<td>(65.000/2.000.000)*100%</td>
<td>3.25%</td>
</tr>
<tr>
<td>6. Headphones</td>
<td>50.000</td>
<td>(50.000/2.000.000)*100%</td>
<td>2.50%</td>
</tr>
<tr>
<td>7. USB cables</td>
<td>49.000</td>
<td>(49.000/2.000.000)*100%</td>
<td>2.45%</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>2.000.000 X</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Pieces ≥ lines (the amount of pieces is always equal or bigger than the amount of order lines)*

### Table 4 Pieces Orange per year

<table>
<thead>
<tr>
<th>Product</th>
<th>Volume m3</th>
<th>Formula</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flyers</td>
<td>0,5m³</td>
<td>(0,5/100)*100%</td>
<td>0,5%</td>
</tr>
<tr>
<td>2. Stickers</td>
<td>0,4m³</td>
<td>(0,4/50)*100%</td>
<td>0,40%</td>
</tr>
<tr>
<td>3. Sim</td>
<td>0,396m³</td>
<td>(0,396/50)*100%</td>
<td>0,395%</td>
</tr>
<tr>
<td>4. Scratch Cards</td>
<td>0,39m³</td>
<td>(0,39/50)*100%</td>
<td>0,39%</td>
</tr>
<tr>
<td>5. Cases</td>
<td>0,382m³</td>
<td>(0,382/50)*100%</td>
<td>0,38%</td>
</tr>
<tr>
<td>6. Headphones</td>
<td>0,374m³</td>
<td>(0,374/50)*100%</td>
<td>0,375%</td>
</tr>
<tr>
<td>7. USB cables</td>
<td>0,369m³</td>
<td>(0,369/50)*100%</td>
<td>0,37%</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>100m³ X</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Table 5 Volume Orange per year

**ABC-analysis calculation**

1. 5.00% x 100% + 5.00% x 0% + 0.5% x 0% = 5.00%
2. 4.94% x 100% + 4.50% x 0% + 0.40% x 0% = 4.94%
3. 4.05% x 100% + 4.00% x 0% + 0.395% x 0% = 4.05%
4. 3.67% x 100% + 3.50% x 0% + 0.39% x 0% = 3.67%
5. 3.25% x 100% + 3.25% x 0% + 0.38% x 0% = 3.25%
6. 2.69% x 100% + 2.50% x 0% + 0.375% x 0% = 2.69%
7. 2.29% x 100% + 2.45% x 0% + 0.37% x 0% = 2.29%
8. Etc.

*Formula: pieces % x pieces priority % + order lines % x order lines priority % + volume % x volume priority % = product importance %
This analysis shows which products have the fastest rotation speed and also which ones should be prioritized within the stocking locations. E.g. out of 1000 product types, 50 products make up for 80% of the rotation within the warehouse which means that 950 products make up for 20%. The ABC-analysis can divide these products in:

- A type products: 80% of the profit (50 different products)
- B type products: 15% of the profit (150 different products)
- C type products: 5% of the profit (800 different products)

Based on this analysis the stock locations can be allocated according to the rotation speed and priorities (volume, order lines and pieces).

Other important conclusions that can be drawn are that the A category products are the most important products and monitoring the stock is important to avoid stock outs. The B category products are products which are reaching the maturity phase of their lifecycle. A marketing campaign or product customization could boost sales. It is important to investigate if the presence of C category products is still necessary for the company. A possible retreat of the products from the market might be a solution. This should be communicated to the client.

(Supply Chain Management Centre Romania, 2012)

4.15. Transportation

Transportation can be handled by KLG with their own trucks, by contracted companies or by the customers themselves. KLG can take care of the transportation from the main warehouse location in Bucharest to the hubs and also from the hubs to the customer. (KLG national distribution network final, 2012)

Between 14:00 and 18:00 the cross dock goods and logistical goods are being consolidated. Afterwards between 18:00 and 07:00 the goods are being distributed to the hubs in Romania of KLG. Between 07:00 and 16:00 cross dock deliveries and collections start. (author KLG national distribution network final, 2012)

According to van Weele; “the supplier of goods must deliver at the right time and at the right quantity.” (p.271, 2010) Once the products arrive, the supplier must present a delivery document, also known as a freight bill, which will be signed by personnel of incoming inspection. The incoming inspection checks the delivered goods and compares with the electronic order copy which they received from the supplier. During this inspection the personnel inspects the quality and the quantity of the delivered products. The delivery can be either approved or disapproved. In case of disapproval a complaint form is filled in and the supplier is contacted immediately. (2010) KLG as a 3PL provider works in the same manner with its customers. The company offers transportation services besides its warehousing processes.
In figure 22 an example of a shipping label is displayed. The label contains the number of the client including the client name, in this case 23 ELKOTECH ROMANIA SA. Furthermore it includes the shipping date, order number, reference number, and the route that the transporter must take. In the middle of the label, the name of the client is displayed once more together with the address. Underneath in the lower section the DPU (Dispatch Unit) as well as the telephone number of KLG where the transporter can call in case of any inconveniences are available. The quantity as well as the order type and the name of the picker are also displayed at the left bottom. In this case the order is picked by the customer (PC).

**4.16. Risk Management**

It is important for KLG to monitor risk and be prepared for different inconvenient situations. Problems might occur with customers and suppliers which can lead to major damage of the company’s image.

A risk has to be detected and described first in cause-effect terms:
1. a risk cause
2. a risk event
3. an objective (RBS IP course block 1, Generic Project Management, 2012)

1. **Mistakes regarding services -> unsatisfied client -> Loss of client**
   Problems with orders and deliveries may lead to unsatisfied customers/suppliers and can result in no contract extension or even breach. It is possible that suppliers do not deliver what they should deliver at the warehouse of KLG, which can result in problems with the retail shops. It is also possible that problems occur between KLG and the retailing shops which result in negative effects on the relationships with the clients. The retailing shops will contact the suppliers and explain to them what went wrong.

2. **Lack of investments in IT -> competitors improve while KLG stagnates -> lose position in the market**
   If KLG does not continue to invest in the development of its IT and services, the company will lose its position in the market because of the fact that competition will advance in technology and services.

3. **Customers want premium services for low cost -> too much flexibility/adaptability -> loss of revenue due to more cost covering by KLG**
   Customers require more and more, they expect premium services for the lowest cost. Because of the fact that KLG does not want to lose its customers, it might be tended to give in too much. This would result in loss of revenue in order to keep the client in the client portfolio.
Chapter 5. Interviews

The thesis research at KLG is a case study which through detailed observation on location, and by conducting interviews in combination with studying documents from internal and external sources, a profound insight was gained into the way various processes operate, and the reasons why they develop in one way instead of another. (Verschuren & Doorewaard, 2010)

According to Creswell: “A case study consists out of studying an event, a program, an activity, more than one individual.” (p. 73, 2007) The interviews which were conducted, have several participants with different positions within the company and logistics department.

5.1. Interview guide

Before interviewing the relevant staff members of KLG Europe Bucharest, a guide was created to clarify the steps that were taken to conduct a successful semi-structured interview. A semi structured interview has been chosen instead of a structured interview because there are several advantages for this particular research, according to Briman and Bell:

- “there is much greater interest in the interviewee’s point of view;
- it gives insight into what the interviewee sees as relevant and important;
- rich detailed answers can be gained.” (p. 474, 2007)

The interviewing process consists out of the following steps:

1. Analyse the topics
2. Prepare an interview guide
3. Make appointments with the interviewees
4. Conduct the interview
5. Finalize the interview transcript

Step 1. Analyse the topics

The analysis of the topics consists out of the following steps:

- Gain insight of the topic
- Facilitate the process of interviewing
- Explain with clarity and accuracy to the interviewee the theme

Step 2. Prepare the interview guide

In order for the interview to have the desired results, an interview guide had to be prepared which consists out of the following steps:

- Describe the different facets of the interview
- Create a variety of questions related to the topic
- Control the flow of the interview

Step 3. Make appointments with the interviewees

The next step is to make appointments with the interviewees to give them the opportunity to concentrate solely on the interview. If an interview without appointment is conducted it is possible that the interviewee will be interrupted with his daily tasks or will not pay attention to the interviewer.
Step 4. Conduct the interview

After an appointment has been made the actual interview can take place with the guidance of the interview guide. It is important to take proper notes and try, if possible, to record the interview.

Step 5. Finalize the interview transcript

If the interview has been recorded it is important to convert this into a written transcript. Furthermore it is important to have an interview transcript to check if the gathered information has been sufficient. (Briman and Bell, 2007)

Interviewee’s criteria

- Only management members who are closely related to the logistics activities of KLG Europe
- Only employees which are directly related to the logistics activities, warehouse employees
- They must have worked for at least six months within the company

<table>
<thead>
<tr>
<th>Function</th>
<th>Level within the company</th>
<th>Experience at KLG</th>
<th>Date of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Logistic Director</td>
<td>Management level</td>
<td>7 years</td>
<td>11/06/2013</td>
</tr>
<tr>
<td>2. Project Manager</td>
<td>Management level</td>
<td>3 years</td>
<td>29/05/2013</td>
</tr>
<tr>
<td>3. Warehouse Manager</td>
<td>Management level</td>
<td>5 years</td>
<td>30/05/2013</td>
</tr>
<tr>
<td>4. Shift Manager</td>
<td>Management level</td>
<td>5 years</td>
<td>30/05/2013</td>
</tr>
<tr>
<td>5. Statistician Reviewer</td>
<td>Management level</td>
<td>6 years</td>
<td>29/05/2013</td>
</tr>
<tr>
<td>6. Logistics IT Manager</td>
<td>Management level</td>
<td>7 years</td>
<td>29/05/2013</td>
</tr>
<tr>
<td>7. Administrator Orange</td>
<td>Floor level</td>
<td>3 years 1 month</td>
<td>03/06/2013</td>
</tr>
<tr>
<td>8. Picker Adidas</td>
<td>Floor level</td>
<td>1 year 9 months</td>
<td>28/05/2013</td>
</tr>
<tr>
<td>9. Picker rest</td>
<td>Floor level</td>
<td>6 years</td>
<td>03/06/2013</td>
</tr>
<tr>
<td>10. Fork lifter</td>
<td>Floor level</td>
<td>7 months</td>
<td>28/05/2013</td>
</tr>
</tbody>
</table>

Table 6 Interviewees
5.2. Template analysis

“The template analysis is used for organising and analysing textual data according to themes. It is useful for the analysis of the interviews conducted at KLG because the different perspectives of the employees can be compared and underlying thinking can be explored.” (Official website of the University of Sheffield; 2013)

Interviews analysis
The following documents can be found in the appendix:
Appendix 3: Interview form (English)
Appendix 4: Interview form (Romanian)
Appendix 5: Interviews transcript
Appendix 6: Template analysis

The following themes and codes have been used for the template analysis:

Experience in the company
One of the criteria for the interviewees was to have at least six months experience in the company. All interviewees have at least six months of experience at KLG and with its inventory management.

Daily tasks
This theme is important because it divides the answers in the codes positive and negative. It contains the aspects that the employees at KLG experience within their daily tasks. The answers help to detect underlying problems which might not even seem to exist at first glance.

Inventory management
The “inventory management” theme consists of the codes; definition, importance, efficiency. This allows the researcher to investigate what inventory management means to the employees, how important inventory management is at KLG and if in their eyes the efficiency is high enough.

Order picking process
The "order picking process" theme consists of the codes; definition, efficiency and mistakes during picking. It allows the researcher to gain insight in the most important aspects of the order picking process in the eyes of the employees.

 Entire process rating
Answers were obtained which graded the entire process at KLG (once the products arrive, until they leave) and categorized according to how efficient the entire process is and how the transportation influences the perception of the entire process. If the processes at KLG are efficient but the transportation is not running smoothly, the customer will still be unsatisfied. It is important to be able to conclude if problems are related to warehouse management or transportation.

Computer systems
The answers that were received by the researcher were all related to the Warehouse Management System (WMS) and its performances. There were no remarks regarding the Transportation Management System (TMS). Furthermore the WMS is more important and relevant to this research than the TMS.

Problems/incidents outside standard procedures
The theme; “problems/incidents outside standard procedures", contains the codes; lack of resources, human errors and client mistakes. The answers that were received were all
related to these three categories which show what aspects influence the inventory management performances at KLG.

5.3. Conclusions

Experience in the company
All the interviewed employees have at least six months of experience. It is important to note that the management level employees possess a high amount of experience and the higher the function the more experience it seems.

Daily tasks
Positive:
- Both the management level as well as the floor level agrees that the standard procedures are generally going according to plan. Some do mention that monitoring is important and that sometimes errors occur, but not on a regular basis.

Negative:
- Transportation/delivery problems are some “external” factors that influence the daily tasks and which belong to a different department.
- Coordination and communication within the warehouse is not optimal. This can be both due to the administrator’s skills as well as the employees under his authority.
- Human mistakes occur, e.g. regarding the picking process, probably a lack of training.
- The reception process shows flaws from time to time, it could be faster and an easier procedure could be implemented. It is important to keep in mind that these problems might also occur due to lack of training.
- Procedures are not followed from beginning to end, which lead to unfinished activities or affect the organization of activities.

Inventory Management
Definition:
- Resulting from all the answers received from the management level employees; the inventory management consists of several aspects; manage the stock, achieve high accuracy, please customers, reduce costs as much as possible, good products flows, and good inventory management facilitates or can be a burden for the other activities within warehouse management.

Importance:
- Regarding the importance of the inventory management; some interviewees answered that it is the most important activity at KLG because if the inventory management fails, all other processes fail. This corresponds to a certain extent with other answers which claimed that it is the foundation of the other processes, inbound, outbound and replenishment, and it is the image of the company towards its customers. One answer was that it is not the most important activity but that other important processes build on it. (reception and outbound)

Efficiency:
- The efficiency level of the inventory management according to most of the interviewees is in general nearly “perfect”, approximately 99,8% accuracy with 0,2% errors, while some assume that improvement is possible. Financially KLG exploits the inventory management to its fullest, but regarding actual accuracy, the company does not achieve the accuracy it intends to achieve. The accuracy which is desired of 99,8% or even 100% is not always achieved for each individual customer.
Order picking process

Definition:
- The interviewees answered that it is the most important activity within the warehouse and it consists out of collecting the right products, preparing them within the shortest time to reduce the checking time and be prepared for shipping.

Efficiency:
- Some employees answered that the order picking is efficient at KLG, better than the average in Romania, but it has to be supported and monitored. The WMS (VBS), shows good results.
- Other employees claimed that the rotation speed is too low due to picker’s efficiency which should be improved. Furthermore the problem of VBS is that sometimes a loss of signal occurs which slows down the picking process. This can be linked to the fact that some employees claim that picker efficiency should improve while there are problems with the system which are not the pickers their fault.

Mistakes during picking:
- The terminals lose signal which leads to automatically logging off the picker, time loss is the result which slows down other processes.
- Tasks are not executed from beginning until end according to standard procedures; this is related to human errors that occur during the order picking process and can be linked to lack of skills and training.

Entire process rating

Transportation:
- Some of the interviewees answered that they were not satisfied completely with the transportation services, orders are not delivered on time, e.g. trucks remain blocked on the road as well as other problems occur which influence the transportation performances of KLG. Furthermore this influences their tasks, because even if they have executed their tasks correctly they are still responsible if the customers are unsatisfied.

Efficiency:
- Regarding the efficiency of the entire process some interviewees rated the services of KLG as very good, thanks to the fact that within 24 hours Romania can be supplied, the WMS is a well-defined system; in comparison with other companies the services at KLG are better.
- Other interviewees were less positive and claimed that the time that is spent per order and the checking time can be both reduced as well as the overall performance of 80% can achieve a higher percentage. A 20% improvement space should be available for the entire process according to some employees.

Computer systems
- The general opinion of the WMS is positive, it is a well-defined system which improves and facilitates the picking process. Sometimes errors occur, e.g. there is a loss of signal in the warehouse.

Problems/incidents outside standard procedures

Lack of resources:
- The interviewees from the floor level claimed that there is a lack of resources regarding, machines e.g. electric trucks. Furthermore there is a lack of fork lifters and other personnel which leads to time losses and slower processes.
- This is contradictory with the management level employees who claim that there should be no lack of resources.
Human errors:

- Important to note is that the management level employees claimed that there are human mistakes that occur, especially from the floor level personnel. E.g. products are placed next to products which should not be near each other. This happened in the case of Euralis which sells seeds and Akzo Nobel which sells paint and paint related products. This might lead to fines if unexpected inspections take place at KLG’s warehouse. These issues are related to work regulations which should be respected.

- Furthermore a mistake that sometimes occurs is that loading platforms are being blocked with products which should not be placed there. Blocking the loading platform leads to unorganized behaviour and loss of time during handling.

Client mistakes:

- Some interviewees claimed that client mistakes are also a very important issue. Sometimes there is a lack of communication between the clients and KLG. Procedures are not followed by the customers and they sometimes request things which are not realistic. It is important for KLG to remain flexible and deal with these issues.
Chapter 6. Findings

This chapter explains the most important findings of this research. It focuses on the findings regarding lead time for operations, replenishment, picking, inbound and specific problems that occurred in the warehouse and which are related to inventory management.

6.1. Current lead time for operations

The lead time for operations at the moment depends on the customer and order. In the case of Orange and Adidas, where small and expensive products are stored, a separate and private warehouse location has been allocated with its own design and functionality. In the case of Orange and Adidas, the storage locations contain cross aisles which allow pickers the possibility to easily move from aisles to aisles instead of walking to the end of a row and turning there. The storage location of Adidas consists out of levels where pickers have to walk up stairs to pick, while the storage location of Orange is situated on the ground floor, with different levels in the storage locations themselves.

The other storage locations in the warehouse do not have cross aisles which makes it more difficult to pick, turn and move, which results in more loss of time. Furthermore the normal storage rows are longer than the Adidas and Orange locations. Coty’s warehouse location has not yet been finalised; this is due to happen during the coming weeks. Coty will have a customized storing area similar to Adidas and Orange. In appendix 9 an explanation of the Coty project has been included.

As mentioned before; depending on the products assortment, volume, rotation within the warehouse, the lead time can differ. The improvement of the activities in the warehouse in one location can have impact on the other locations as well. If for example a certain order is been handled in a wrong way and products are placed on the loading/unloading platforms, this can disturb orders which are taking place at the same time. If an order is being handled correctly or even faster than planned, the workforce can afterwards help with other orders. Resulting from this example it can be concluded that improving an activity, storage location or organization method, it can have positive impacts on the entire warehouse’s performance.

6.2. Replenishment

<table>
<thead>
<tr>
<th>Fixed quantity</th>
<th>Fixed replenishment (M1)</th>
<th>Variable order period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable quantity</td>
<td>Periodic replenishment (M3)</td>
<td>On-demand replenishment (M4)</td>
</tr>
</tbody>
</table>

Table 7 Replenishment strategies

There are four replenishment models which can be used to have an appropriate replenishment strategy which corresponds with the demand and type of products. There are two variables which are important when deciding which replenishment strategy to use; the ordering period and the quantity which can be either fixed or variable. (Specialised Logistics website, Logistik, 2013) In the case of KLG the customer (e.g. Adidas, Orange or LG) is contacted by the retailing shops which communicate that they are running out of stock at their locations. Once the customer receives these demands, it contacts KLG and places orders which have to be delivered at the retailing locations. It depends per
retailing shop how much and what they sell, which makes the ordering period variable as well as the quantity. This means that the On-demand replenishment strategy is the most appropriate in the case of KLG.

Due to the fact that the replenishment is variable, it becomes a more complex process in comparison to the other replenishment strategies and KLG must be flexible and react to customer demands. This makes it also difficult for KLG because sometimes unexpected things happen, e.g. a large increase in stock from the customer’s side, which leads to too many products in time.

6.3. Picking

According to Piasecki (owner/operator of a consulting firm providing services related to inventory management); to have successful picking within your warehouse it is important to keep in mind the following three aspects:

- "productivity: the picking rate that is being achieved during picking;
- cycle time: the amount of time it takes to get an order from order entry to the shipping dock;
- accuracy: the accuracy that is being achieved during the picking process." (2013)

In the case of KLG; batch/multi-order picking is the most appropriate way of picking due to the fact that multiple orders can be picked during one pass. The picker is guided by VBS to show him the products he has to pick and the best route he should follow. Thanks to VBS the picker cannot mix orders and will have to follow the instructions shown on the portable scanning unit. The portable scanning units are connected to VBS which communicate data back and forth. The picker has to scan the location of the products that have to be picked once he or she arrives.

Figure 25 Order picking

Over 3000 orders and 12,000 order lines are picked daily at KLG Romania. (author KLG Logistics Services, 2013)

The distribution of an order picker’s time is very important because an analysis could make room for improvements. Furthermore there might be a shift in priority which would mean that the picker would have to spend more time on a certain activity. (Tompkins et al, 2003)
In comparison to the typical distribution of an order-picker’s time, the allocation of time is different at KLG. Regarding other activities 5% is allocated while setup takes approximately 5% of the time as well. The largest amount of time is spent on the picking itself. The search for the appropriate products takes 5% because the products are well grouped and organized and if the picker follows the instructions of the manual terminal, no extra time should be wasted. The travelling itself takes around 20% of the time because depending on where the products are located, a picker has to travel to the back of a row and back to the front again.

**6.4. Inbound**

The SKU’s at KLG are divided among shelves, racks and bulk area. The shelves and racks contain smaller products usually, while the bulk area is used for heavy and large products e.g. washing machines, large televisions, refrigerators etc.

The ABC-analysis is used continuously to determine the appropriate storage locations for the different products. Furthermore it helps to monitor the performances of the individual products. According to the ABC-analysis, the most important products are placed at the front of the storage area (A), less important products (B) are placed after the A-products and the least important products (C) are placed after the B-products.

This means that a picker would not have to travel too often to the back of the warehouse to pick C-products, because these products rotate the least. The Logistics IT manager handles most of the ABC-analysis activities at KLG.

**Control**

To have an efficient inventory management it is vital to have a good stock accuracy. The stock locations have to be checked and monitored as often as possible. If the accuracy is high, the picking process is facilitated. If the accuracy is low it can lead to inefficiency and negative results for KLG.

**Current stock accuracy**

The stock accuracy at KLG should be around 99,80% or even 100%, this would correspond with the financial performance of the stock accuracy. KLG charges a price which should correspond with a nearly perfect stock accuracy. Unfortunately the performances do not match the actual price that KLG charges for all its clients. In the example of Adidas, the target is to reach 99,98% stock accuracy, while the minimum achievable % is at 98,00 and with a critical 97,00% in worst case. Because Adidas has a separate stock area and division, the accuracy is higher than in the case of other clients. Depending on the customer, the stock accuracy at KLG differs, but the target is still around 99%.

**6.5. Problems in the warehouse**

**Situation 1.**

A truck arrived with products which had to be unloaded. The driver had to wait for paperwork to be able to start unloading. The same truck had to be loaded with other products. The priority is always to unload the truck first before starting the loading process (including picking, moving products).

It is important for the pickers/loaders to not waste time and reduce the amount of actions. If the warehouse manager does not prioritize and communicate well, pickers/loaders waste...
time which leads to more costs, late deliveries and this can even lead to relationship damage with the customer.

**Situation 2.**
The loading platforms of the trucks have to be organized well, space for movement of machinery must be kept at all-time available. The division is mostly 30 pallets left next to a platform, 20 pallets right of the platform, another platform and 10 pallets right to the other lane which brings the total to 60 pallets. Unfortunately sometimes it happens that the loading/unloading platform is blocked by too many products, which leaves no space for machinery or quick movement.

**Situation 3.**
Akzo Nobel paint was delivered in different amounts and different packages. Some packages were stable; the covers were well designed for transportation, and did not form a problem, while others moved during transportation because of the cover design. This led to problems and it was necessary for KLG to take the products out of their larger package and repack them appropriately to avoid damage during transportation. Eventually Akzo Nobel changed the covers and this facilitated pallet forming as well as improved the state of the products which arrived in one piece.

The problem now with the paint orders is that because of the different types of paint packages/weight, the storage area has to be designed in order for a picker to avoid too much travelling with a heavy load. A lane is 100m long and if a picker is required to travel to the back and drag along huge and heavy packages, this would exhaust the picker, which would result in reduced efficiency.

**Situation 4.**
An order was placed by one of KLG’s customers to deliver 188 pieces (not referring to exact amount). Unfortunately four pieces were damaged. KLG delivered 184 pieces but the customer wanted 188 pieces, due to the fact that communicated lacked between the warehouse employees and the office employees. KLG charges the client per pallet and not the amount of pieces. Eventually KLG delivered the remaining pieces.

**Situation 5.**
An order was placed by a customer, 144 pieces (glasses, not referring to exact package, box or piece). The glasses were packed in boxes of three. Instead of sending 144/3= 48 boxes. The warehouse employees sent 144 boxes of three glasses which resulted in 432 pieces. The customer received three times the actual order, which led to inconveniences. KLG paid for the transportation back to the warehouse. The most important consequence was damage of the relationship with that particular customer. It depends on the customer how many inconveniences it will accept until he will end a contract.

**Situation 6.**
A truck arrived with plates, glasses and other kitchen cutlery. The driver could not open the hatch because he did not have the proper equipment. It took approximately half an hour to open the truck which was loaded with around 60 pallets. Loss of time occurred due to this inconvenience.
Chapter 7. Discussion

*This chapter explains what the researcher has done, which approach has been chosen and why the results are important for the company.*

The main research question of the thesis was; “How can the inventory management of KLG Europe Bucharest be optimized in order to achieve reduced lead time for operations?” The sub questions which were created were concentrating on investigating the current state of the company regarding inventory management, lead time for operations and the order picking process. Furthermore the questions were intended to investigate how the personnel and management see the current situation of the inventory management activities at KLG.

Despite the short period that the researcher has spent within the company, a clear and good view has been formed of the activities at KLG and the inventory management. Time has been spent within the warehouse itself to understand what inventory management physically means. Instead of concentrating only on one customer within the warehouse, the researcher preferred to spend time within all the different areas of the warehouse to be able to compare and offer solutions and recommendations for different specific situations. Thanks to the fact that the researcher interacted frequently with the warehouse personnel and management, a more complete view of the processes has been created. It became clear to the researcher that specific problems occur within a warehouse which can affect the inventory management. The conclusions which were obtained from the observation within the warehouse are valuable because they were drawn directly from the working floor. The results have helped to create a clear view of the current state of the inventory management.

Even if the amount of interviewees was low in comparison to the amount of total employees at KLG, the researcher has concentrated on the employees that are directly linked to the inventory management of KLG and have enough experience to offer relevant answers. The information which was obtained is valuable because it offers a clear view of the personnel’s as well as the management’s perceptions towards the inventory management activities of KLG.

The observation which was conducted by the researcher has been subjective to a certain extent, but important information has been obtained. The observation which has been conducted has been performed while keeping in mind all the theory regarding logistics that the researcher has accumulated during his studies. The combination of real life situations within the warehouse with the theory possessed by the researcher, make it possible to offer clear conclusions and recommendations to the management of KLG to optimize the inventory management in order to reduce lead time for operations.

The current state of the inventory management activities has been explained in detail within this thesis, in order to be able to investigate what possible solutions KLG could apply to optimize. The findings show that the inventory management at KLG can be improved, and that a small change in one section of the warehouse can positively influence another part of the warehouse. The picking process is one of the activities which needs improvement; mostly delete the amount of human mistakes that occur. It is important to monitor the customer’s product portfolios as well as the rotation speed of the products to arrange the stock locations as efficient as possible and avoid inconveniences during picking.

Many problems that occur within the warehouse can be avoided if the organization and communication within the warehouse improves. This will save time and money both for KLG as well as the customer. Due to lack of experience in some sections of the warehouse, processes are not executed according to standard procedures. Some employees within the warehouse do things their “own” way instead of following procedures. Inconveniences occur during, picking, replenishment, loading/unloading and monitoring.
Employees from the work floor generally complain about a lack of communication, resources and loss of signal by the devices that they use. If the management of KLG succeeds to improve these aspects, it would offer the employees no possibility to “hide” behind other problems and it will be exactly clear who works efficient and according to guidelines and who does not.

The current stock accuracy at KLG is good in comparison to other 3PL providers in Romania, but there is still room for improvement. If the company wants to reduce costs and improve results, it will have to continuously keep on making the processes more efficient and monitor the activities that are performed within the warehouse.

The approach which the researcher has adopted started off with defining a clear problem statement which would be achievable to investigate within the period of time allocated for the thesis. The researcher started the actual research with first of all understanding what KLG means as a company and what it offers to its customers. Appropriate literature has been selected to be able to conduct a research related to inventory management. An academic framework has been used to analyse and apply different theories which are linked to inventory management.

The sources were provided by the company or selected by the researcher, both from literature as well as online academic articles and specialized websites. The research continued with investigating the current state of the inventory management, lead time for operations and the order picking process. After a clear view was created of the current state of the inventory management activities at KLG, interviews were conducted with a specific group of employees which consisted of floor level employees as well as management level employees. Employees were chosen which are directly linked to the inventory management activities of KLG. Valuable conclusions have been drawn from the interviews which give a good view of the perceptions that the employees have of KLG’s performances and activities.

The approach that the researcher has chosen can be categorized as the IMRAD structure; introduction, methods, results, discussion and conclusion. This structure has been imposed by the RBS Thesis Guide, but it corresponds with the type of research because the goal is to collect data (through observation, desk and field research) and draw clear conclusions in order to offer the management of the company useful recommendations.

KLG Europe can optimize its inventory management in order to achieve reduced lead time for operations by following the recommendations, which resulted from the conclusions of the research, which will be given in chapter 8.
Chapter 8. Conclusions/recommendations

This is the last chapter of the thesis and by far the most important one. It summarizes the conclusions which have resulted from the research. It continues with recommendations for the management of KLG and afterwards what the consequences of the recommendations mean on a daily basis, which plans have to be made and what implementations to apply to improve the situation. The most important recommendations have been quantified in order to offer a clear view of their impact on the company. The chapter ends with the limitations that the thesis has faced.

8.1. Conclusions

1. Lack of communication and miscommunication in the warehouse between warehouse employees; as well as with the management at the offices.

2. Warehouse employees do not realize the effects of their actions on the processes of KLG; they make mistakes which are unacceptable:
   - loading/unloading platforms are sometimes blocked with products;
   - products are placed next to products which should not be in the same area because of environmental regulations which can lead to penalties resulting from inspections (e.g. Euralis and Akzo Nobel products);
   - complaints about resources while there should be enough (e.g. pallets, machinery, employees);
   - warehouse employees do not execute activities/tasks according to procedures or they do not execute activities/tasks until completion.

3. Misunderstandings and lack of communication between customers and KLG.

4. Communication flaws occur between the amount of pieces ordered by a customer and the amount of sets that are available and delivered at the warehouse of KLG. It often happens that due to the pieces/sets, inconveniences occur and customers receive too much or not enough products.

5. The travelling distance for some products, that the picker has to cover, is too long and should be reduced.

6. There is not enough monitoring and control within the warehouse regarding the employees.

7. The reception process is not as efficient as it could be.

8. The picking process shows flaws because of human mistakes or IT problems (e.g. loss of signal of the hand terminals and communication flaws), which slow down the picking process. The system takes time to calculate the route that the picker has to follow (approximately 15 minutes) while continuing with a new order. The picker is being sent from one end of the warehouse to another which results in loss of time and inefficient picking.

9. The stock locations and accuracy of some products are not optimal.

10. The clients of KLG are not “educated” enough regarding logistics and what they should expect and do themselves to facilitate logistical activities and improve performances.

11. Some products (from different customers) are in the warehouse of KLG for a very long time, some even since the company moved to the new location. They occupy space which could be used more efficiently or for more profitable customers.
12. There are too many products “in time”, which is the opposite of what KLG wants to achieve. The fewer products there are in time, the better the stock accuracy.

8.2. Recommendations

The conclusions that were mentioned in the previous paragraph continue with clear recommendations for the management of KLG.

1. Communication must be improved between warehouse employees and the management. It can be achieved through meetings each day a couple of minutes to discuss what has to be done and where priorities lie, furthermore the personnel should be divided efficiently during these meeting in order to use the 12:00-16:00 interval as efficient as possible. Communication between warehouse employees must improve as well, if something is not clear they should communicate with the administrator to receive confirmation of what has to be done. An option is to create an organisation chart which would be placed in the warehouse in order for each employee to see who he should contact in case of questions. The organisation chart should be different for Adidas, Orange and Coty where certain employees are allocated as well as delegated from the companies.

2. Warehouse employees must understand what the consequences are of their actions, that even the smallest actions can have a huge impact on the entire process.

- Loading/unloading platforms must not be blocked; they should place products in other areas. There should be a sign placed at each platform which emphasizes the fact that blocking the platforms is not acceptable.
- Products should be stored according to regulations in order to avoid possible penalties, even if this means that one will have to search for other locations to store the products that one is working with at that particular moment.
- Communicate clearly to the warehouse employees that there are enough resources, or ask them to make an inventory list of what they require. If employees are required in a certain area, this should be communicated to the administrator as soon as possible.
- Monitor if employees execute their tasks to completion and according to procedures.

The person that links the ideas of the management with the warehouse employees must be well informed of what has to be done, he should communicate this during the short meetings that were mentioned previously.

3. Improve communication with customers in order to avoid inconveniences. Request for confirmation when important decisions have been taken regarding amounts, payment, delivery dates etc.

4. Clear distinction should be made in e-mails and documents regarding the amount of pieces that a set includes, it should be clearly stated in e-mails which are sent by customers to KLG. Once the order has been received at KLG, the person who is responsible for the order should confirm that the appropriate amount of sets or pieces will be sent to the right destination. Afterwards this should be clearly communicated to the warehouse employees and they should confirm as well in order to avoid inconveniences. Some employees are scared to take responsibility; this can be linked to the Romanian culture where a high power distance is visible in companies. It must be communicated to the employees that making mistakes is human and that no punishments are attached. It is better to show responsibility so a problem can be solved, instead of hiding and ignoring.
5. Reorganize the locations and storing modes for some customer and products to reduce the travelling distance. Use crushability; pallet forming according to volume to improve picking speed. A programme/software to load the pallets as effective as possible according to size weight of products/boxes should be implemented.

6. Improve the monitoring and control within the warehouse. Have more experienced employees within the warehouse as administrators which can coordinate and monitor the younger employees and teach them important aspects.

7. Increase the efficiency of the reception process. Training and clear procedures as well as continuous control by supervisor are advised.

8. Improve the picking process. It is important to investigate the fact that some employees claim that picker efficiency should improve while there are problems that occur with the hand terminals/system which are not the picker’s responsibility. If the problems with the system are solved and efficiency does not improve, it means that the efficiency of the pickers is a separate problem that has to be solved. Picker’s efficiency could be improved through picker’s training.

9. There should be more cycle counting in the warehouse in order to have a high level of accuracy regarding the locations of products. If idle moments occur during a day, they should be used for cycle counting.

10. KLG should focus on “consulting” and “educating” the customer which would avoid many difficulties as well as improve efficiency of the processes within the supply chain. KLG should create certain “rules and procedures” that should be presented to the clients. Employees of KLG should explain them and also visit and discuss with the customers what they could do themselves to facilitate the procedures that influence KLG and the efficiency of the supply chain. Improved efficiency within the supply chain will benefit both the client, as well as KLG.

11. Marketing must push sales, from the customer’s side; this would get rid of the stock which has been within the warehouse of KLG for too long. KLG should communicate a list of products which have been in the warehouse for too long. E.g. if a product is in the warehouse for more than 3 months, this should be communicated to the customer in order to try to get them out of the warehouse, either through disposal or sales.

12. In time products must be placed back into the locations to reduce the amount of in time products within the warehouse and improve stock accuracy.

*This problem has been stated separately of the previous communication problem because of its huge impact on the processes. During the research period it happened a couple of times that inconveniences occurred regarding the amount of sets and pieces which resulted in very unhappy customers and extra costs for KLG.
8.3. Results of the recommendations

This paragraph describes what the consequences are for the way in which the company conducts its business and what measures should be taken to implement the recommendations.

1. Time should be invested in these small meetings as well as the communication between the administrator and the warehouse employees, which will lead to better employee division (especially between 12:00 and 16:00), better task understanding, and improved efficiency.

2. 
   - Warehouse employees have to stop placing products on the platforms in order to avoid blocking them. They will have to find spaces to place the products, but efficiency will still improve because of the fact that the amount of inconveniences that occur at the moment will be reduced.
   - This might result in more time that is spent on the process, but it will not lead to any environmental problems or fines from the inspectors.
   - Extra material might have to be purchased if resources are indeed lacking, employees will be divided according to priorities which might lead to new situations in which these employees are placed, and it might even be necessary to hire extra personnel. If materials are not lacking, an employee from KLG should make an inventory of what the company has and divide them appropriately among the warehouse areas.
   - Efficiency of the warehouse employees will improve, but this might be achieved only if extra administrators are hired or training opportunities are offered to employees.

3. This recommendation will result in more mails, but on the other hand it will offer a higher certainty and warranty for KLG’s activities.

4. The inconveniences (e.g. loss of time and costs) that occur have a far greater impact on KLG’s performances than the fact that more time should be spent on this confirmation process, between the customers and the employees of KLG as well as the management level employees and the warehouse employees.

5. Time will have to be spent on the implementation of crushability for certain customers; but this will result in improved efficiency on the long term which is more important. It might be necessary to implement a programme or software which will result in investment and which will pay off in the future. A good example is the Pallet Lite Basic Palletising software which helps users to create pallet patterns and is available on the website: [http://www.capesystems.co.uk](http://www.capesystems.co.uk). A print screen of the programme can be seen in appendix 8.

6. This will result in a shift of employees’ tasks, more experienced employees could be promoted to monitor, or experienced administrators will have to be hired. If this shift occurs, it might be necessary to hire new employees to execute the tasks that at the moment are executed by the employees that will become administrators. The new employees will have to be trained which will include an investment of money and time.

7. This measure will consist of an employee shift as well as possible extra employment as mentioned in the previous recommendation. It is important to divide the personnel efficiently and assign them the most appropriate tasks.

8. The IT department will have to solve the signal loss problem and if this does not improve pickers’ efficiency, monitoring of the pickers will have to be reinforced. If certain pickers are not effective enough, they should have a skill evaluation and follow training if necessary.
There should be more cycle counting in the warehouse, which means that the current warehouse employees should spend more time on this aspect, if they do not have time, extra employees should be hired who will mainly have as task to check the locations and accuracy of products. If this accuracy increases it will facilitate many processes of the inventory management.

This measure includes many aspects. First of all it must be clear to KLG what it wants to communicate to its customers. The next step is to figure out how and who will do this. To be able to consult and give advices, KLG should have enough experienced employees that have time to manage this. It might be necessary to create and print certain documents and folders with explanations as well as hiring extra staff members. The advantage is that KLG can become an example for other companies and have a competitive advantage thanks to its specialised and specific consulting services.

KLG should set a certain amount of time as a maximum to keep products in storage; if this amount of time passes it should be communicated to the customers in order for them to come with ideas to get rid of these “obsolete” products. At the moment the storage period of the products within the warehouse of KLG differs between products that arrived today and products that have been in storage for years.

The amount of stock locations should be increased; the client should communicate on time when an increase of stock is expected instead of waiting until it happens. This forces KLG to deal with a high amount of “in time products”. Furthermore cycle counting of the locations in the warehouse would increase in order to improve efficiency and make it possible to integrate the in time products successfully into the storage locations.

8.4. Quantification of the most important recommendations

Software implementation

Pallet Lite is available for installation on a single PC, and is available in English, German, Spanish, Italian, Swedish, Japanese and Polish.

The implementation of the CAPE Pallet Lite software would bring along an investment of 318 pounds for the software itself which can be translated into 5,17(5-7-2013) lei * 318 pounds = 1644 Lei. Depending on the management of KLG, an amount of software copies can be purchased. A possibility would be to install five versions, for Coty, Adidas, Orange, the rest of the customers (in the warehouse) and in the offices on the IT manager’s computer. This would result in a total cost of 5*1644 Lei = 8220 Lei.

Furthermore time would be necessary to spend on understanding how the programme works. Preferably it should be presented by the IT manager during a course. The advantage of this programme is the fact that data can be inserted easily; solutions can be created and viewed. It would improve the efficiency of the pallet forming which would result in improved efficiency.

Another possibility for KLG is to also purchase Truckfill from the same company, software which helps create the best truck and container load plans for multi-products. The truck size can be selected, as well as of the products or pallets which need to be transported. The software offers the best solutions regarding how to load
the truck as efficient as possible. The price of the software is similar to the Pallet Lite software.

**Investments**

1. Cost of programme
2. Time spent on training

**HRM**

Resulting from the conclusions of this research, there is a possibility that a HRM issue is apparent at KLG. Training and education seem to be insufficient for certain employees. The processes could be improved if the skill level of the employees would increase.

At the moment, the employees in the warehouse are hired by the warehouse managers, while the warehouse managers are hired by the Logistics Director. Higher functions within the company are recruited by high level management members. There is no separate HR department at KLG Europe Romania SRL.

Regarding training and education; for each customer, there are codes of conducts and also work procedures which explain what and how activities should be executed for each customer. There are no official training courses for the employees and also no standard code of conduct due to the fact that it would consist out of too many pages according to one of the managers, around 500. Learning by doing is the preferred method at the moment.

Two interesting conclusions can be drawn;

1. No HR department at KLG
2. No standard training or general code of conduct

A possibility for KLG would be to keep the individual code of conducts per client, but also create a general code of conduct which covers all the general aspects which the employees encounter in the warehouse. This could be linked to a standard training which could be implemented to learn new coming employees as well as current employees of what the “standard” procedures are. This would lead to better preparation and understanding of the “specific” codes of conduct of the different customers as well as refreshing and broaden the current employees their minds. The main investment here would be time, because management employees should provide the training as well as creating the standard code of conduct. In money the loss could be expressed again in the amount of hours that these employees could not have worked.

**Investments**

1. Set up a HR department
2. Create a standard training procedure
8.5. Limitations of the work

This research has been carefully prepared and executed, but the researcher is well aware of its limitations and shortcomings.

First of all, the research was conducted for two months at KLG’s location in Bucharest, Romania. Two months is not enough to fully understand what is happening and comprehend all the details, and everyone’s function/activities.

Second, the amount of interviewees was limited to a small group of nine interviewees with different functions in the company which are directly related to the inventory management. Of course it is not possible to generalise conclusions from these nine interviewees that would represent all the employees that are related to the inventory management. All employees who are related to the inventory management should be interviewed to have 100% credible evidence.

In addition, the observation that was carried out could have been interpreted subjectively by the researcher. Depending on the researcher’s perception and ideas, conclusions have been drawn that resulted from the observation within the company.

Furthermore, it is not possible to assume that the conducted interviews have been answered 100% honestly by the interviewees.
Chapter 9. Bibliography

This chapter includes the bibliography list with all the sources that have been used during this research. The literature is divided in primary literature and secondary literature. Primary literature is divided in academic articles and company documents and official specialised websites. Secondary literature is divided in books and academic articles. At the end of the chapter, a list of the websites that have been used to obtain documents has been listed.

Primary literature

Academic articles

- Adeyemi, Salami, (2010). Inventory Management: A tool of optimizing resources in a manufacturing industry, University of Llorin, University of Technology Ogbomoso.
- Jeffrey Barry, (2013). How well are you managing your inventory?, F. Curtis Barry & Company (Consulting firm for Retail Businesses).

Official specialised websites

- Van Boxtel official website administrator, (2013). EDI.
- Van Boxtel official website administrator, (2013). WMS.

Company documents

- Official company document information, (2012). Warehouse Layout KLG.
- Official company document information, (2013). Brosura KLG.
- Official company document information, (2013). PL.21.03.14 Procedura de inventar specific Adidas KPI.
- Official company document information, (2013). Prezentare VAS.
Secondary literature

Books


Academic articles

Inventory Management Chapter 11.pdf consists out of the following sources:


Websites


Appendices

Appendix 1. Orange warehouse layout, official company document
Appendix 2. KLG warehouse layout, official company document
Appendix 3. Interview English

Interview KLG Europe

This interview will be conducted at KLG Europe Bucharest for the purpose of supporting the thesis research of Petruș Ghiță, student at Rotterdam Business School (RBS).

Name interviewee:

Date/time:

Place:

1. **What is your function within KLG Europe?**

2. **How long have you worked for KLG Europe?**

3. **Within your function and tasks that you perform, what goes well and smooth?**

4. **Within your function and tasks that you perform, what does not go according to plan?**

5. How would you define inventory management?

6. How would you define the order picking process?

7. **Do you think the order picking process is efficient enough?**

8. How efficient do you find the process of preparing, checking and loading at KLG (from the moment an order has been received until the truck leaves)

9. How important do you find the role of the inventory management among the other activities of KLG?

10. In your opinion, does the inventory management of KLG Europe achieve the expected results?

11. **Have you encountered any problems/incidents outside the standard procedures that slowed down your activities?**

* the bold questions have been used for the floor level employees
Appendix 4. Interview Romanian

Interviu KLG Europe

Acest interviu va fi realizat la KLG Europe București, în scopul de a susține teza de cercetare a lui Petruș Ghiță, elev la Rotterdam Business School (RBS).

Nume:
Data/ora:
Locul: KLG Europe Bolintin Deal

1. Ce funcție aveți la KLG Europe?
2. De cât timp lucrați pentru KLG Europe?
3. În funcția pe care o aveți și sarcinile pe care le efectuați dumneavoastră zilnic, ce lucruri vi se par ca mărg bine/conform planului?
4. În funcția pe care o aveți și sarcinile pe care le efectuați dumneavoastră zilnic, ce lucruri vi se par ca NU mărg bine/conform planului?
5. Cum ați defini managementul stocului? (inventory management)
6. Cum ați defini procesul de picking? (order picking process)
7. După parerea dumneavoastră, procesul de picking este destul de eficient?
8. Cat de eficient vi se pare tot procesul de pregătire, verificare și încărcare (de când vine comanda de la client până la plecarea camionului)
9. Cat de important considerați că este rolul “managementul stocului” în comparație cu alte activități la KLG?
10. In opinia dumneavoastră, credeți că “managementul stocului” al KLG Europe obține rezultate suficient de bune?

11. Ce probleme/incidente în afara procedurilor standard intalniți în activitatea dvs?

* the bold questions have been used for the floor level employees
<table>
<thead>
<tr>
<th>Function</th>
<th>Petruș Ghiță</th>
<th>1. What is your function within KLG Europe?</th>
<th>2. How long have you worked for KLG Europe?</th>
<th>3. Within your function and tasks that you perform, what goes well and smooth?</th>
<th>4. Within your function and tasks that you perform, what does not go according to plan?</th>
<th>5. How would you define inventory management?</th>
<th>6. How would you define the order picking process?</th>
<th>7. Do you think the order picking process is efficient enough?</th>
<th>8. How efficient do you find the process of preparing, checking and loading at KLG (from the moment an order has been received until the truck leaves)?</th>
<th>9. How important do you find the role of the inventory management among the other activities of KLG?</th>
<th>10. In your opinion, does the inventory management of KLG Europe achieve the expected results?</th>
<th>11. Have you encountered any problems/occurrences outside the standard procedures that slowed down your activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistic Director (ML)</td>
<td>Logistic Director</td>
<td>7 years</td>
<td>Everything goes according to plan, except for some small exceptions.</td>
<td>In some situations my employees do not bring their tasks to a good end (they do not check if they have completely finished what they need to do) which makes it necessary for me to follow up and check.</td>
<td>The most important activity within Warehouse Management. A good stock accuracy simplifies the rest of the operations. Preparing orders for delivery consist out of picking and checking. Proper picking reduces the checking time which leads to increased performances.</td>
<td>At KLG, it is. In Romania it is not.</td>
<td>At KLG it is very efficient.</td>
<td>At KLG, the inventory management, is the foundation on which all warehouse activities are build up on; inbound, outbound, replenish.</td>
<td>Yes, there is room for improvement but generally speaking the results are good.</td>
<td>Most problems occur due to clients’ requests. Work regulations are not always met and that is why we need to handle problems which are isolated/not within the standard procedures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Manager (ML)</td>
<td>Project Manager</td>
<td>3 years</td>
<td>Daily evaluations and reports, solving the problems that occur. Picking mistakes, wrong deliveries of orders.</td>
<td>Stock administration, avoid + of – in stock.</td>
<td>The most important process within the warehouse.</td>
<td>Yes it is efficient, as long as it is supported and monitored.</td>
<td>It is efficient because KLG can handle orders and distribute them within 24 hours within Romania.</td>
<td>It is efficient because KLG uses a well-defined warehouse management system.</td>
<td>Yes, there have been no poor results up until now.</td>
<td>It happens that order are not delivered on time, or the truck remains blocked on the road. Furthermore there is a lack of resources (machines)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouse Manager (ML)</td>
<td>Warehouse Manager</td>
<td>5 years</td>
<td>Compliance with the cut-off time</td>
<td>System as well as human mistakes</td>
<td>Complete accuracy of the products within the warehouse</td>
<td>The most important procedure of the working activities.</td>
<td>Yes</td>
<td>It is efficient because KLG uses a well-defined warehouse management system.</td>
<td>Yes it achieves almost complete accuracy.</td>
<td>Deliveries that are not on time (transportation).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shift Manager (ML)</td>
<td>Shift manager</td>
<td>5 years</td>
<td>Evaluations and projects</td>
<td>Delivery problems</td>
<td>Complete accuracy of the products within the warehouse</td>
<td>The most important procedure of the working activities.</td>
<td>Yes</td>
<td>It is efficient because KLG uses a well-defined warehouse management system.</td>
<td>Yes it achieves almost complete accuracy.</td>
<td>Deliveries that are not on time (transportation).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistician reviewer (ML)</td>
<td>Statistician reviewer</td>
<td>6 years</td>
<td>The standard procedures if they are monitored continuously.</td>
<td>The coordination/communication within the warehouse. Managing the stock you have in the warehouse in order to please the clients while achieving the lowest costs possible. Collecting the appropriate products from the right locations and preparing them for shipment.</td>
<td>At the moment 35 mins per order and 15 mins checking the order. This can be improved. The rotation speed can increase (picker effectiveness)</td>
<td>No, it can be improved. The rotation speed can increase (picker effectiveness)</td>
<td>At the moment 0.2% mistakes.</td>
<td>99.8% accuracy and 0.2% mistakes.</td>
<td>Human mistakes (products are placed next to products which should not be placed) and (loading platform is blocked with products) Client communication</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Logistics IT manager (ML)</td>
<td>Logistics manager</td>
<td>Projects implementation</td>
<td>Success of the logistical operations, qualitative as well as quantitative, abe- analysis which leads to a satisfied customer and a good flow of products within the warehouse.</td>
<td>The sum of all procedures which have as a goal the preparation of the goods within the shortest period of time for the client as well as the logistical operator.</td>
<td>No, there is room for improvement.</td>
<td>There is room for improvement.</td>
<td>40% out of the total with 50% for reception processes and 10% for outbound.</td>
<td>Financially it achieves 100% but the stock accuracy is actually around 99%. It depends on the client and its location within the warehouse.</td>
<td>Client communication and procedures (computer systems)</td>
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<tr>
<td>Picker Rest</td>
<td>Picker Rest</td>
<td>The picking process is working correspondingly.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Yes it is</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>More resources (machines)</td>
<td></td>
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</tr>
<tr>
<td>Administrator Orange(FL)</td>
<td>Administrator Orange</td>
<td>Process, scan, free and finish orders</td>
<td>In some rare cases, procedures are not executed correspondingly. (products are not received in the order that they should)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Lack of resources, machines.</td>
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<tr>
<td>Picker Adidas (FL)</td>
<td>Picker Adidas</td>
<td>The ADIDAS orders handling and validation.</td>
<td>The reception process is slow and consists out of many steps. I personally think that a more simple procedure could be implemented.</td>
<td>X</td>
<td>X</td>
<td>The picking process regarding ADIDAS is going smoothly, (with exception the loss of signal) and the procedures are being executed correctly which makes the achievement of goals easier. Regarding the TEMA products, there is a problem with the DPU’s which are created according to the article and not the locations which lead to loss of time and extra costs.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>- There is a small amount of electric trucks and this leads to losses in time and slows down processes. - VBS problems occur; products get &quot;stuck&quot; in different phases which makes them unfit to be stored in proper locations and prepared for shipment. An administrator must first check these products and give approval, which takes time. - The signal of hand terminals is down sometimes which leads to automatically logging off the user of the terminal. Time is lost and...</td>
<td></td>
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<tr>
<td>Fork lifter (FL)</td>
<td>Fork lifter</td>
<td>7 months</td>
<td>The standard procedures</td>
<td>Communication between colleagues and the organisation within the warehouse</td>
<td>X</td>
<td>X</td>
<td>Yes it is due to the system/programme which is being used (VBS)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Lack of resources, small amount of fork lifters</td>
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Processes are slowed down.
## Appendix 6. Template analysis

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<td>Positive aspects</td>
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<td>Using evaluations and reports, solving the problems that occur</td>
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<td>Compliance with the set-off time</td>
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<td>Evaluations and progress</td>
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<td>7</td>
<td>The standard procedures if they are monitored continuously</td>
<td>1</td>
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<td>8</td>
<td>The picking process is working correspondingly</td>
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<td>3</td>
<td>4</td>
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<td>6</td>
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<tr>
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<td>The standard procedures</td>
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<td>The ADIAS orders handling and validation</td>
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</tr>
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<td>11</td>
<td>Process, create, finish and release orders</td>
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<td>6</td>
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<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Everything goes according to plan, except for some small exceptions</td>
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<td>5</td>
<td>6</td>
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<td>Negative aspects</td>
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<td>9</td>
<td>10</td>
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<td>14</td>
<td>Picking mistakes, wrong deliveries of orders</td>
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<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>15</td>
<td>Systems as well as human mistakes</td>
<td>1</td>
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<td>3</td>
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<td>Filling problems</td>
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<td>17</td>
<td>The information communication within the warehouse</td>
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<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>18</td>
<td>The receiving process is slow and consists out of many steps. A more simple procedure could be implemented</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>19</td>
<td>In some rare cases, procedures are not executed correspondingly. (products are not received in the order that they should)</td>
<td>1</td>
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<td>20</td>
<td>In some situations, employees do not bring their tasks to a good end and they do not check if they have completely finished what they needed to do which makes it necessary for follow up and check</td>
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<td>21</td>
<td>Inventory management</td>
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<td>22</td>
<td>Definition</td>
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<td>23</td>
<td>Stock administration, avoiding stock out and stock</td>
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<td>24</td>
<td>Complete accuracy of the products within the warehouse</td>
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<td>25</td>
<td>Managing the stock you have in the warehouse in order to please the clients while achieving the lowest costs possible</td>
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<td>26</td>
<td>Success of the logistical operations, qualitative as well as quantitative, also analysis which leads to a satisfied customer and a good flow of products within the warehouse</td>
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<td>27</td>
<td>The most important activities within Warehouse Management: A good stock accuracy simplifies the rest of the operations</td>
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<td>28</td>
<td>Importance</td>
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<td>29</td>
<td>The inventory management is the most important activity because if this fails, then everything fails as well</td>
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<tr>
<td>The most important activity</td>
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<td>The most important one because the image of the company is at stake as well as problems with the clients can occur.</td>
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<td>Not out of the total with 80% for reception processes and 10% for outbound.</td>
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<td>This is the rule management, in the foundation on which all warehouse activities are build up on, inbound, outbound, replenish.</td>
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<td>Efficiency</td>
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<td>Yes, there have been no poor results up until now.</td>
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<td>Yes, it achieves almost complete accuracy.</td>
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<td>There is 3% accuracy and 2% mistakes.</td>
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<td>Financially it is achieving 100% but the stock accuracy is actually around 80%.</td>
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<td>Yes, there is room for improvement but generally operating the results are good.</td>
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<td>Understanding process</td>
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<td>Elimination</td>
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<td>The most important process within the warehouse.</td>
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<td>- Collecting the appropriate products from the right locations and preparing them for shipment.</td>
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<td>- The sum of all procedures which have as a goal the preparation of the goods within the shortest period of time for the client as well as the logistical operator.</td>
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<td>- Preparing orders for deliveries consist out of picking and checking. Proper picking reduces the checking time which leads to better performances.</td>
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<td>Efficiency</td>
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<td>Yes it is efficient, as long as it is supported and monitored.</td>
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<td>No, it can be improved. The rotation speed can increase (picker effectiveness).</td>
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<tr>
<td>Yes, there is room for improvement.</td>
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<td>Yes it is due to the system/programme which is being used (VIS).</td>
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<td>The picking process regarding AMIAS' is going smoothly, with exception the loss of signal and the procedures are being executed correctly which makes the achievement of goals easier.</td>
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<td>Regarding the TEMS, products, there is a problem with the DPM which are created according to the article and not the location which lead to loss of time and extra costs.</td>
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<td>At KLG it is. In Romana it is not.</td>
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<td>Mistakes during picking</td>
<td>346</td>
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<tr>
<td>Yes, it is.</td>
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<td>The signal of hand terminals is down sometimes which leads to automatically logging off the user of the terminal. Time is lost and processes are slowed down.</td>
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<td>Tasks are not executed from beginning until the end.</td>
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<td>Entire process rating</td>
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<td>No</td>
<td>Issue Description</td>
<td>Severity</td>
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<td>Transportation</td>
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<td>If the transport vehicle does not come on time, the truck remains blocked on the road.</td>
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<td>3</td>
<td>Deliveries that are not on time (transportation)</td>
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<td>Defining problems</td>
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<td>Efficiency</td>
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<td>6</td>
<td>KLG can ensure delivery within 24 hours within Romania.</td>
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<td>7</td>
<td>KLG uses a well-defined warehouse management system.</td>
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<td>8</td>
<td>At the moment 35 miles per order and 15 miles checking the order, this can be improved.</td>
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<td>9</td>
<td>Barcodes at the moment, room for improvement</td>
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<td>10</td>
<td>At KLG it is unnecessary and efficient.</td>
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<td>11</td>
<td>Warehouse management system</td>
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<td>12</td>
<td>Picking is effective due to the system programme which is being used (VIPS)</td>
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<td>13</td>
<td>Problems/inconsistencies outside standard procedures</td>
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<td>14</td>
<td>Lack of resources</td>
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<td>Not enough forklifts</td>
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<td>16</td>
<td>Lack of resources, small amount of forklifts</td>
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<td>17</td>
<td>There is minimum amount of electric trucks and this leads to losses in time and slows down processes.</td>
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<tr>
<td>18</td>
<td>Human errors</td>
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<td>19</td>
<td>Human mistakes (products are placed near to products which should not be placed and loading platform is blocked with products)</td>
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<td>20</td>
<td>Work regulations are not always met and this is why we need to handle problems, which are isolated not within the standard procedures.</td>
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<td>21</td>
<td>Client mistakes</td>
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<td>22</td>
<td>Communication</td>
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<td>Procedures</td>
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<td>24</td>
<td>Most problems occur due to clients' requests.</td>
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<td>25</td>
<td>ML: Management level, E-PM level</td>
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<td>26</td>
<td>E1 Logistic Director (ML)</td>
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<td>E2 Project Manager (ML)</td>
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<td>E3 Warehouse Manager (ML)</td>
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<td>E5 Statistician Reviewer (ML)</td>
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<td>E6 Logistics IT Manager (ML)</td>
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<td>E7 Administration Officer (FL)</td>
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<td>E8 Picker Adidas (FL)</td>
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<td>E9 Picker Nest (FL)</td>
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<td>E10 Fork Lift (FL)</td>
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Appendix 7. Logistics client portfolio

LOGISTICS CLIENT PORTFOLIO

Domo
Panasonic
Wrigley
AkzoNobel
LG
Red Bull
3M

www.klgeurope.com
Appendix 8. Pallet Lite software
Appendix 9. Coty project implementation

Coty project implementation at KLG

Coty started off as a French perfume company, nowadays the company focuses on beauty products; cosmetics, body care and perfumes. The company has around 10,000 employees and its corporate headquarters is based in New York City. The net revenue for 2012 has been around 4.6 billion dollars.

Coty has requested KLG to take care of their product inventory. In order to do this, a huge shift of products from their current warehousing location to KLG was necessary. The huge shift of products took place on Saturday the 29th of June and Sunday the 30th of June 2013. The researcher was lucky to be able to experience this project. The advantage for the researcher was the ability to experience what inventory management means in its purest form, starting from scratch. In the following Visio Diagram on the next page the steps are displayed which took place during these two days. Furthermore the researcher was given the task to take pictures of the activities that occurred during these two days. The pictures can be seen after the Visio Diagram.

The Inventory Management for Coty during these days consisted out of several steps

1. First of all the products were delivered to the warehouse of KLG by trucks.
2. Once the trucks arrived they were unloaded.
3. The next step of the reception was to place the products in the bulk area, full pallets together and other pallets separately. The pallets were divided and checked to see which ones were full and which were not.
4. It was necessary to check a part of the pallets manually; this consisted out of counting all the products within all boxes to know if what was delivered corresponded with the shipment documents.
5. Afterwards the products were brought to the maintenance area where IT-department employees filled in all the necessary information in VBS. (e.g. weight, measurements, type of products etc.)
6. Full pallets were brought to the upper storage levels while the other products were integrated into the lower locations.
7. The locations were checked several times to have a good stock accuracy and inventory management.

Because of the scale of the project it was impossible not to have any problems, even if the employees and management at KLG experienced similar situation with Adidas and Orange.
Problems that occurred were:

1. Products were not integrated in the appropriate locations.

2. The proper quantities were not integrated in the proper locations, e.g. according to the system there should be 100 products while physically there are 200 available (not referring to exact amount).

3. The maintenance process was not executed properly.

4. Once orders will be released there will be a huge quantity of products which will be taken down from the upper levels for replenishment and placed in time because of the fact that orders for Coty products consist of many different products at once.

5. There was lack of communication between Coty and KLG regarding the codes of the products, codes were displayed on sets as well as single units which resulted in errors.

6. The boxes in which the products arrived contained too many markings regarding quantities on the outside which resulted in confusions. This led to manual counting.
Inventory Management Coty

- Products transfer from Coty to KLG
  - Tracks arrived
  - Products were unloaded
  - Reception
  - Products are placed in the bulk area
    1. Pallet division
    2. Check
    - IT department
    - VBS
    - Maintenance
  - Full pallet
    - Stored in upper locations
  - Not full pallet / smaller quantities (fractions)
    - Integration in lower storage locations (shelves)
  - Cycle counting (stock accuracy)