
**Best warehousing practices and developments in the online re-
tailing sector**




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ABSTRACT

This thesis, commissioned by HAMK UAS, examines the best warehousing practices and developments in the online retailing sector. The objective of this thesis was to give information on how online retailers managed their warehousing issues. The theoretical part of this thesis is built on several books and internet articles. Each topic discussed in the practical part is supported by theory.

The beginning of the thesis contains the research methodology, general information about online retailing, its place in the world and historical background as well as warehousing and its functions within the online retailing sector. The questionnaire as the main method for acquiring data was based on theoretical background of online retailing. As a result, we have listed the best practices utilized at European and Russian warehouses of internet retailers.

Answer rate was 5/20(25%) from the European side and 10/20(50%) from the Russian side. The results are presented as graphs and tables. From the results we can clearly observe at which development stage the companies are and where they are headed in a future development process. We also discuss integration as a necessity in each warehouse process. In the end of this thesis we make conclusions that open up new ideas for development and show blind spots on different levels such as the implementation of warehousing tools, analysis of the function and cloud storage as possible and most likely development directions. All the graphs from the Russian side are placed here as appendices for better readability. The information about integration is applied for the Russian side as well, but not discussed for easy reading.

Keywords warehousing, warehousing tools, warehousing practices, automation, integration, online retailer, e-commerce, e-tailers.

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CONTENTS

1	INTRODUCTION.....	1
2	RESEARCH METHODOLOGY	1
3	CONNECTED SIMILARITIES OF ONLINE RETAILERS	5
3.1	Large scale.....	5
3.2	Trust factor for consumers	6
3.3	Data collecting opportunity.....	6
3.4	Assemble-to-order approach	6
3.5	Time window.....	6
3.6	Opportunity to serve efficiently	7
4	BACKGROUND OF ONLINE RETAILING.....	1
4.1	Timeline	2
4.2	Summary of the history	5
5	LOGISTICS IN TERMS OF INTERNET SHOPPING.....	7
5.1	Key logistics factors for successful internet retailing	7
5.2	Purchasing	7
5.3	Warehouse and its functions	8
5.3.1	Definition of warehouse	8
5.3.2	Functions of warehouse.....	8
5.4	Transportation or the Last mile.....	9
6	DEFINITIONS OF DIFFERENT WAREHOUSING PRACTICES	10
6.1	Integration	10
6.2	Outsourcing	10
6.3	Drop-shipping.....	10
6.4	Planning in terms of warehousing.....	11
6.5	Warehousing management system	11
6.6	Automated conveyor system	11
6.7	Zoning of a warehouse approach	11
6.8	Bar-code system	12
6.9	RFID(Radio frequency identification)	12
6.10	Cloud services in WMS.....	12
6.11	Automated guided vehicle system.....	12
6.12	Pick up points of the goods	12
6.13	Automated pick-up terminals	12
6.14	Key performance indicators(KPI)	13
6.15	Short summary	13
7	WAREHOUSING BEST PRACTICES WITHIN ONLINE RETAILING SECTOR	13
7.1	Current situation in Europe	14
7.1.1	Amount of employees versus amount of warehousing workers.....	14
7.1.2	Outsourcing or private warehouse.....	15

7.1.3	Inventory keeping and drop-shipping.....	16
7.1.4	Latest warehousing tools	17
7.1.5	Counting and registering of goods	18
7.1.6	Automated conveyor system	18
7.1.7	Technology replacing conveyor system	18
7.1.8	The process of storing goods in general	19
7.1.9	Zoning of a warehouse	19
7.1.10	RFID system.....	20
7.1.11	Cloud services	21
7.1.12	Automated guided vehicle system(AGVS)	21
7.1.13	Pick up points of the goods	22
7.1.14	Key performance indicators	22
7.1.15	Development strategy	23
7.1.16	Short summary about warehousing practices in Europe	23
7.2	Current situation in Russia	23
7.2.1	Amount of employees versus amount of warehouse workers	24
7.2.2	Outsourcing or private warehouse.....	24
7.2.3	The role of planning in terms of warehousing.....	24
7.2.4	Latest warehousing tools(RFID, Bar-coding, 5S, Lean management)..	24
7.2.5	Counting and registering of goods	24
7.2.6	Automated conveyor system	25
7.2.7	Technology replacing conveyor system	25
7.2.8	The process of storing goods in general	25
7.2.9	Zoning of a warehouse	25
7.2.10	Efficiency of bar-code system	25
7.2.11	RFID system.....	26
7.2.12	Cloud services	26
7.2.13	Automated guided vehicle system(AGVS)	26
7.2.14	Pick up points of the goods	26
7.2.15	Automated pick-up terminals	26
7.2.16	Key performance indicators	26
7.2.17	Development strategy for the nearest 5 years.....	27
7.3	Short summary about best warehousing practices of Russian online retailers .	27
8	CONCLUSIONS	27
	SOURCES	29

1 INTRODUCTION

The general objective of this thesis was to examine the current best practices of warehousing within the online retailing sector. The main objective was to find and depict the best practices to create a vision about the current situation to possible future paths in warehousing. To achieve the stated objectives, a survey on internet retailing was done. A strong theoretical basement about the role of warehouse within online retailing will be built and based on that the questionnaire for companies will be created and sent to Russian and European online retailers. The questionnaire results should provide the information about current situation and possible future paths in terms of warehousing of online retailers.

Online retailing is a term that had appeared in the worldwide stage approximately after the second millennium. The main difference from usual retailing is that instead of physical experience of products consumer searches for the product using his computer. The layout of electronic retailing is a web page where the products are listed as separate web units with pictures and descriptions. Consumers cannot touch the product, but look and read the description only. Sometimes, especially in toys, consumer can watch the video of how the product is utilized by people. That video service can provide even more information than the physical assessment, because many products are placed in a certain package in physical retailing stores. In the next chapter we will talk about six main similarities of online retailers, which define online retailing sector as a whole structure. That information shows the size of the sector and provides the reader with a picture of what is this market about.

1.1 Research methodology used

Companies are business units that are extremely busy making money. They were not willing to write long answers to my questions and that is why a questionnaire with multiple choice and some of short answers was taken as the main research method here. The survey was divided into two parts. In the first one we talk about actual warehousing practices that are common all over the world. The second step was the questionnaire that was sent to 20 Russian companies and 20 European. The questionnaire was built based on theoretical background of online retailing. The results from the questionnaire are discussed mostly in graphs and tables with my personal comments. The results are divided into two parts: the European and the Russian. In the end, in the summary we talk about the differences between the Russian and the European approach to warehousing.

1.2 Background of online retailing

After defining some general factors of online retailing today, it is time to show how online retailing took on such a significant role in our everyday lives. In this chapter we talk about the history of online shopping to draw a

parallel between the present and the past. The source of information and the figures used for this chapter come from website called Instantshift.

1.2.1 Timeline

1979

An electronic service called Videotext was launched in the UK and grew into the first electronic service which can provide the user with such information as weather forecast, news, prices for certain products, timetables of theatres and cinema and etc. The system worked as an automated database to which the person accessed using his id through phone line, computer and a keyboard. The system showed requested information on the user's screen. The same year, Michael Aldrich introduced a concept of Teleshopping, which became the first root of current online shopping. Later on, this service brought much benefit into banking. The same technology called CompuServe was developed in the US approximately the same year. Michael Aldrich is on the figure 1.



1979

Figure 1 Michael Aldrich

Source: (Instantshift 2017)

1982

A platform called Minitel was successfully launched in France and UK. It was the first platform that used telephone line connection for shopping. Mainly, it was a developed Videotext technology, which allowed users to make purchases, check share market, search telephone catalogue and even chat. (Instantshift 2017)

1987

A group of software developers launched an offshoot of CompuServe called Swerg. It was the first online market for software products, which rose up very quickly into large software market with different payment options. (Instantshift2017)

1990

Tim Berners-Lee wrote the first Worldwide Web. He also introduced the first browser, which drastically changed the direction of online shopping and development of web in general. (Instantshift 2017)

1992

J.H. Snider and Terra Ziporyn introduced the book called “Future Shop: How New Technologies Will Change the Way We Shop and What We Buy”. This book became revolutionary in development of the worldwide web. (Instantshift 2017)

1994

Netscape, American computer services company, introduced its web-browser Navigator. The company released SSL encryption for safe online transactions. The same year Pizza Hut offered online ordering system and such products as cars and bikes were already selling on the internet. (Instantshift 2017)

1995

Amazon was launched on 5th of July as an online bookstore in US. According to the history, the first customer of Amazon was John Wainwright, computer scientist, who bought a book about computer models. The transaction happened in April, though, official opening of the shop is dated in July. Fun fact is that later on Amazon named one of its headquarters in Seattle after Wainwright. The sign with the name of the first customer, the date and name of the book was placed nearby office in Seattle. AuctionWeb (Ebay) got in the business as an online based auction in US. The first web-radio has appeared and companies Dell and Cisco started to use online transactions. Online business gathered development with high speed. Figure 2 shows the interface of Amazon and E-bay in early 90-s.



Figure 2 Amazon & Ebay interface

Source: Instantshift

1996

A year after Amazon and Ebay boom there was a Russian try of creating an online shop by programmer Andrew Gerasimov who created the first online

shop of CDs, however, it was not a successful try and after a while, Russian book shop(Symbol.ru) was created by a group of developers with much more success.

(Instantshift 2017)

1999

Napster music service was launched. It was peer-to-peer file service sharing audio records mainly in mp3 format. The portion of ecommerce according to business.com was \$7.5 million. ATG Stores opened an online market of home decorative items. Elon Musk and a few other entrepreneurs have launched PayPal payment service, which became a part of NASDAQ market.

(Instantshift 2017)

2000 – The Dot Com Investment Bust

By this year many companies already had the strategy so called: “Develop now, profit in the future”. In the middle of 2000 there was a huge jump over 5000 points in NASDAQ stock market due to many companies have gone online as can be seen in figure 3.



Figure 3 NASDAQ jump

Instantshift 2017

2002

Ebay acquired PayPal payment service for \$1.5 billion. Many retailers in US opened web pages with selling products.

(Instantshift 2017)

2004

By this year, Apple offered iTunes store with digital music download. Congress developed the first set of rules for online marketing in US.

(Instantshift 2017)

2008

Huge growth of Ecommerce with around 20% of yearly growth. Facebook is launched successfully. Iphone offers its users to buy and download apps

from applications' store. The era of applications for phones starts its development. Retailers are considering using applications as another channel for reaching the customers. Amazon introduces Kindle e-book.

(Instantshift 2017)

2009

Amazon is leading the industry with daily turnover of \$2.5 trillion and annual growth of 14%. Ebay is on the second place with \$1.9 billion.

(Instentshift 2017)

1.3 Summary of the history

There was not any exact information on the history of online retailing after the year 2009, and there might be a certain reason for that. The future development of online retailing is really broad and many companies have evolved into pioneer of one or another technological development, however, Amazon is still the leading company within online retailing sector. By looking at the history of Ecommerce, we can clearly see the dependency between technological development and new paths for online retailing. The history of ecommerce provides the information that tells that the biggest portion of developments lied down in English speaking countries, which can be a proof that English is the easiest way of communication. Nowadays, online retailing became so common that for many people that it is much easier to shop online than going to the physical stores. We can buy online anything we want: starting from toys, ending with cars and tickets, and we should say big "thank you" to the technologies that afford us to do so.

2 SIMILARITIES BETWEEN ONLINE RETAILERS

The first roots of online retailing took place in 1979 and by 2000, such companies as Amazon and E-bay were already launched. As for supply chain management, the existence of such market rose up new challenges in the operational scale and logistics structures. According to Ping Josephine Xu(2005) there are six main similarities of online retailers or e-tailers that connect the market into one structure. The list of six similarities by Ping Josephine Xu – Order Fulfillment in Online Retailing is presented below.

2.1 Large scale

The first similarity is the large scale that every e-tailer faces on everyday basis. To be as friendly to the customers as possible, e-tailers state on their websites a universal number of products. That is enough obvious because e-tailers are not limited with physical space and all the products are easily available for the customer through the web site. In practice, such combination follows to the large-scale operations with huge amount of SKU in stock.

(Xu 2005)

2.2 Trust factor for consumers

The second similarity is all about trust. Brynjolfsson and Smith(2000) stated in the article that trust is a crucial factor between e-tailer and its customers in terms of evaluating the service. That is, the component of timely delivery is considered as the component of trust (Keeney 1999), showing that reliability of supply chain is one of the most important factor for the customers in online retailing.

(Xu 2005)

2.3 Opportunity for data collection

The third similarity is about collecting the data. Every online retailer is able to collect tremendous amount of data since the time customer starts browsing on the web site to the actual receiving of order. That provides a strong basis for the question of how online shops should share their data with customers. If there is a need to share real-time data, for instance. It also affects the layout of internet retailer created for every individual customer, so to say, personalization of shopping experience at the web page of retailer. Commonly used technique is advertising similar products that customer looked before and offering the accessories to the products that are already in the digital cart.

(Xu 2005)

2.4 Assemble-to-order approach

The fourth similarity shows the way e-tailers use to profit from every order. If a customer orders multiple items, the simple version of technique assemble to order is applied. The order can contain multiple items, which are assembled into one shipment to reduce transportation costs. However, there are some existing challenges. The most common is a diverse number of products in one customer order. Those products need to be assembled into one order that can be a challenging task for a picker in large warehouse.

(Xu 2005)

2.5 Time window

The fifth similarity is about delayed demand. In usual retailing stores, the demand occurs at the same time with transaction, unlike online retailers. In online retailing, demand occurs much earlier than the time inventory is consumed from a warehouse. E-tailers can use that time window to advance shipping options and logistics efficiency to reduce costs. As an example, we can take 2 customer orders: one orders a book from Turku and another orders a book and headphones from Tampere. We assume that orders happen simultaneously and the company has two warehouses: Warehouse 1 in Helsinki and Warehouse 2 in Jyväskylä. Warehouse 1 has both: the book and the headphones in stock, while Warehouse 2 has only the book. The easiest and cost efficient way in this situation is to assign Warehouse 1 to ship an order from Turku and assign Warehouse 2 to ship an order to Tampere.

However, in practice, such orders can happen in different times and without thinking it through during a time window, such situation can result in 3 shipments, which is more costly than 2 shipments as given in the example.
(Xu 2005)

2.6 Opportunity for efficient service

At the last, unlike physical shops, where retailer serves customer demand, in online retailing customer cannot visit and control how their demand is been served. E.g. customer cannot choose which physical store to visit. That gives additional benefit to e-tailer, who can use all efforts to efficiently serve the demand and reduce operational costs, whether its drop shipping or in-house inventory source.

(Xu 2005)

3 LOGISTICS IN TERMS OF ONLINE SHOPPING

Logistics and its functions play the most significant roles in online shopping and every successful company includes logistics structure already in its initial business plan. Without understanding of logistics, an internet shop will not survive in the world where many physical retailers with rich experience of sales entered an online stage. When a company wants to go online, the first thing it needs to take into account is logistics. We will define the importance of logistics for e-tailers later on.

3.1 Key logistics factors

1. Organization of purchasing
2. Organization of warehousing
3. Organization of transportation

(Sokolova 2015)

3.2 Purchasing

That is enough obvious that for efficient establishing of internet based shop the purchasing takes the first role. Defining the demand, market analysis, standards for purchasing products, building relationships with suppliers, creating databases of reliable suppliers, advancing purchasing processes and quality control – are only few operations involved in purchasing. Given list of operations defines the importance of purchasing function for e-tailer from logistical point of view. The list can be supplemented and elaborated much further, but we will stop with purchasing to pay more attention to a more related definition – warehousing.

(Sokolova 2015)

3.3 Warehouse and its functions

In this part, we will discuss a warehouse itself as a functional unit of supply chain. That will give us a clear understanding of the need of warehousing and inventory keeping.

(Sokolova 2015)

3.3.1 Definition of warehouse

Basically, a definition of a warehouse is not really complex and everyone can understand it. A warehouse is a building with a space, where companies are storing goods, commodities. More interesting is the definition of warehousing as a set of techniques for storing goods in the most efficient manner. In online retailing, the functions of warehouse are similar to the functions used in a basic retailing shop, but with its own specialties. That is why we define the functions of a warehouse in general, since different online retailers use warehousing functions from different perspectives.

(Sokolova 2015)

3.3.2 Functions of warehouse

1. **Receiving and unloading** function. This includes unloading the incoming transport. Check the goods according to the stated standards of packaging. Store the goods in the warehouse and make a recording in WMS that the goods are received and stored accordingly. This function can also include unpacking and repacking of the goods. For instance, if the package of received goods does not match the standard of packaging stated by retailer.
2. **Inspecting** function. This function is needed to make quality and quantity check of the received goods.
3. **Repackaging** function is required if arrived goods cannot be stored in the warehouse in their original package. Many manufacturers use pallets as the main stocking unit and the goods are arriving already in pallets.
4. **Storing** function – actual storing of goods in their assigned locations.
5. **Order picking** function. This function happens when a customer places the order and the goods have to be picked from a warehouse in assigned quantity at a given time. Picking operation is very important since it is costly and highly depends on how well the warehouse space is organized.
6. **Sorting** function – works when the goods are sorted and placed according to customer orders. Good example of this function can be a technique FIFO(first-in-first-out).
7. **Shipping** function - happens when the goods are shipped from a warehouse according to customer order information. Pre-packaging is included in this function as the goods should be prepared for the customer as required.
8. **Cross-docking** function – used when the goods are transferred to the shipping area directly from receiving. Commonly used by large

online retailers with utilization of automated warehouse system such as rolls and conveyors.

9. **Replenishment.** Happens when the goods are moved from deep-storage area to a picking area. This function maintains required stock availability in the picking area which helps reaching high customer service level.

(Sokolova 2015)

Basically, there are two options, which online retailers can use to operate with ordered goods – with warehouse and without it. The first option is discussed above; the second is called drop shipping. If a company uses drop shipping, it orders goods from a manufacturer only after customer has paid the price and the company organizes delivery straight from manufacturer to the customer. Even drop shipping looks as the easiest way of doing business it is not actually so. Drop shipping lacks quality check before sending to the customer. It is also hard to monitor the availability of the product at the manufacturer, which can result into delay of lead-time. However, for small-sized business with the least investment, drop shipping can become a good starting point, but in any way, the company needs to think through logistics to organize successful deliveries.

3.4 Transportation or the Last Mile

Delivering the right goods at the right time to the customers is a fundamental objective of a successful internet shop in terms of customer service. The main question of transportation or so-called Last Mile is who will be responsible for it: Whether the company uses its own delivery service or outsources it. There are two factors affecting the decision on transportation:

1. The scale of the business
2. The location of the actual shop

As for serious and major players, the company itself can organize transportation since the resources afford this service. Unlike small and medium-sized online retailers for whom the easiest way to organize transportation will be outsourcing. In the first case, when an online retailer organizes delivery service itself, much attention should be paid to the delivery-person. The reliability and the human factor play significant roles in business because in most cases, the delivery person is the only representative of the company with whom the customer communicates directly. The safety of the product and on-time delivery also depend on the delivery person, which underlines the importance of using the right people in the transportation service. However, it is not always about the people. For instance, Amazon company have applied in their delivery service drones that deliver the goods to the customers by air transportation. Such a technique opened up new paths to organizing the last mile transportation.

(Sokolova 2015)

4 WAREHOUSING PRACTICES

Previously we discussed general aspects of warehousing in terms of online retailing. There was not much information about actual warehousing practices. Now, before going into practical part of this thesis we need to distinguish and define exact practices that are utilized in a warehouse. The structure of this chapter is reflecting the structure of questionnaire in a way that every definition used in the questionnaire will be first discussed in this chapter. The references for this chapter are different internet definitions and book Contemporary Logistics by R. Murphy and Donald F. Wood (2017)

4.1 Integration

First, we need to define integration and its processes in logistics. Integration – is a connection of different parts into the whole structure. Good example of economic integration can be European Union. For logistics, integration is divided by internal and external. By internal integration we mean internal functions of one company that are connected into one working system. For example, such warehousing processes as storing, counting, tracking and sourcing are connected (integrated) into one system of processes called inventory management. External integration is defined as connection of companies into alliances. In the future chapters, by integration we mean only internal integration.

(R. Murphy and Donald F. Wood (2017))

4.2 Outsourcing

Outsourcing in logistics is the practice when one company hires another company to do manufacturing, storing or transportation processes for the hiring business. For example, food producer can easily solve the problem of transportation using outsourcing, to transport finished products to the points of sales.

(R. Murphy and Donald F. Wood (2017))

4.3 Drop-shipping

Drop shipping is a type of a business cooperation with supplier, when internet shop is ordering the product only after the receiving the payment for this product and organizes the transportation to the customer straight from supplier.

(R. Murphy and Donald F. Wood (2017))

4.4 Planning in terms of warehousing

Every successful company takes into account the role of planning in terms of warehousing. Given role can be reflected by several most common planning techniques. The first technique is MRP(material requirements planning) – is the technique that afford us to calculate the exact amount of materials needed for production, the amount that needs to be ordered from the supplier and leftovers for the next shift. The second technique is called Safety stock. This technique is utilized to calculate from one hand materials' level for reducing the risk of stockouts and from the other hand to maintain adequate amount of materials at the warehouse.

(R. Murphy and Donald F. Wood (2017))

4.5 Warehousing management system

WMS – is computer software that is used at the warehouse to count and control inventory movements. In the past, companies used paper sheets to control inventory levels at the warehouses, however, after the technology was discovered, the control of wide range of processes such as labeling, replenishing, moving, counting, transferring and etc. became much easier. Simple example of WMS can be databases created in MS Excel and MS Access.

(R. Murphy and Donald F. Wood (2017))

4.6 Automated conveyor system

Large companies are using automated conveyor system at their warehouses to reduce the costs on physical labor. The usage of conveyor can bring many benefits such as the reducing of mistakes and more advanced technology of transporting goods at the warehouse. The system speeds up the movement of goods and delivers each product exactly on the time it is ordered from the warehouse. Automated conveyors' system is mostly used when company is operating with large amount of products. Automated conveyors are used in receiving, putaway and storing processes. For example, Amazon is using advanced technology of automated conveyor system.

(R. Murphy and Donald F. Wood (2017))

4.7 Zoning of a warehouse approach

Zoning of a warehouse is the approach that helps to distinguish products by different categories. For instance, ABC classification provides the information about most demanded and least demanded products. Using such classification it is very easy to zone your warehouse according to it and put most demanded products in the pick-up zone, and least demanded products in deep storage area.

(R. Murphy and Donald F. Wood (2017))

4.8 Bar-code system

Bar-code system is the combination of computer software, mobile scanners and printers that are used to count, register and move the products in warehousing management system to control the amount of products easily and efficiently without piles of paper.

(R. Murphy and Donald F. Wood (2017))

4.9 RFID(Radio frequency identification)

Small tags that produce magnetic field on a certain frequency. RFID tag is usually attached to the product and contain certain information such as ID of the product in WMS. Unlike bar-coding, the product is scanned automatically without physical scanning.

(R. Murphy and Donald F. Wood (2017))

4.10 Cloud services in WMS

Cloud service – is technique that provides the access to the warehousing data no matter where you are. It stores all the data into digital cloud storage that can be access from anywhere using personal login and password.

(R. Murphy and Donald F. Wood (2017))

4.11 Automated guided vehicle system

AGVS – is an advanced system of warehousing operations. The system contains special transport that moves on certain warehousing areas and transports the goods from one place to the other. This technique is very expensive and totally replaces physical labor at the warehouse, especially, deep storage areas. Amazon is one of the pioneer of this technique.

(R. Murphy and Donald F. Wood (2017))

4.12 Pick up points of the goods

The idea of pick up points lies down in the easiness of transportation function. It is much easier to create several pick up points in the city, from where the customer can get the product, than to deliver each product to each customer manually.

(R. Murphy and Donald F. Wood (2017))

4.13 Automated pick-up terminals

The idea is the same as pick up points of the goods; however, instead of the person who gives away the product, there is bar code or id scanner that automatically opens the shelf with desired product for the customer.

(R. Murphy and Donald F. Wood (2017))

4.14 Key performance indicators(KPI)

Key performance indicators – is the way that is used by companies to assess how efficient the company achieves its business objectives. For example, KPI can be the rank of standard quality products that are defined by consistency and reliability of quality check.

(R. Murphy and Donald F. Wood (2017))

4.15 Short summary

In this chapter, we went through main warehousing practices and drew few parallels between them. Now we know how these practices should be used in the company and what result they should give. At this point, we finished with theoretical part of this thesis. We will find out how these practices are utilized in real life in the next chapters.

5 BEST WAREHOUSING PRACTICES IN ONLINE RETAILING SECTOR

Finally, we are at the most important part of this work. The statistics from the questionnaire is discussed in a consistent way starting from brief numbers ending with actual gradation of best warehousing practices. Since two questionnaires(Russian and European) were completed, the answers from European questionnaire are discussed in one paragraph, and the answers from Russian questionnaire are depicted in the other paragraph. All in all,, there were 5 responses from European side and 10 responses from Russian side, hence, data from Russian questionnaire is more accurate. There is worldwide practice of information sharing where confidentiality takes place, that is why the answers from the questionnaire are anonymous. Also, in this chapter we will talk about integration as the main factor for development. We take into account that in business there is no such thing as middle-point in development. There is either development or degradation.

5.1 Current situation in Europe

5.1.1 Number of employees versus number of warehousing workers

What is the amount of people working in your company? (5 responses)

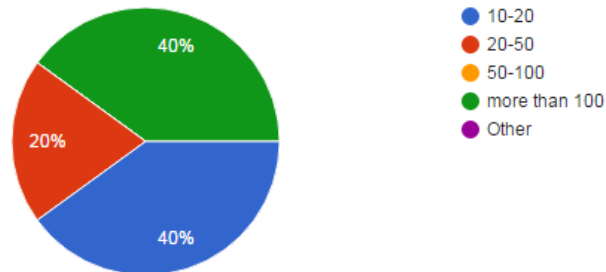


Figure 4 Amount of employees

Data in figure 4 provides us the information that the biggest part of the respondents are large and middle-sized internet retailers. Based on that statistics we can see that only 2(40%) respondents from Europe are small-sized companies. Let us keep this fact in mind for further analysis.

What portion of employees are involved in warehouse activities?

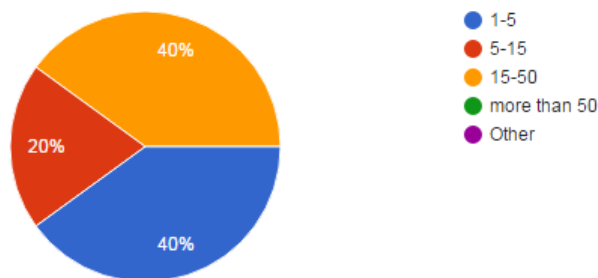


Figure 5 Employees involved in warehousing activities\

On figure 5 we can clearly see how many employees are involved in warehousing activities. It would be easy to make a conclusion that only small companies have a small number of warehousing workers, however, in reality it is not always so because different companies have different level of optimization of warehouses. In our case, the data is accurate relatively to the number of employees, which we can see in Table 1:

Table 1 Dependency between number of employees and number of warehousing workers

more than 100	15-50
20-50	5-15
10-20	1-5
more than 100	15-50
10-20	1-5

Based on Table 1 we can make the conclusion that the more employees there are in the company, the more employees are involved in warehousing activities. For instance, we can see that small-sized companies with 10-20 employees are having only 1-5 warehousing workers, while large companies with over 100 employees are having 15 to 50 workers at the warehouse. In addition to warehousing issue, it should be said that even those companies that are having limited warehousing funds need to ask help from other companies for creating reasonable pricing. These “other” companies exist for saving capital resources. By keeping capital resources, I mean hiring warehousing workers during high volume periods to cover holes in capital leakage. In perfect case, everything should be taken into account and analyzed in terms of expenses.

5.1.2 Outsourcing or private warehouse

Do you use your own warehouse or outsource it? (5 responses)

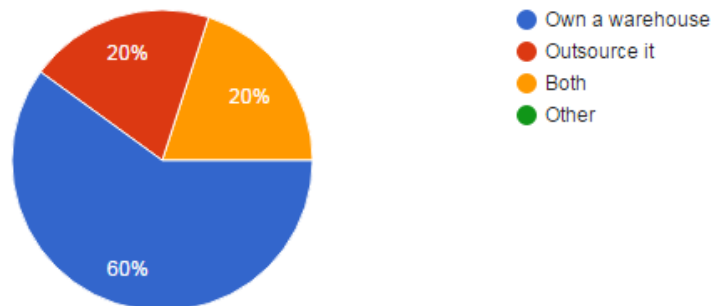


Figure 6 Outsourcing or owning of a warehouse

Three out of five companies are using their own warehouses, while one company outsources and one company uses both options. Using your own warehouse can be costly at the beginning, but it pays off well in the end. The other reason for owning a warehouse might be in the low volume of goods to be stocked, e.g. if your product is mobile phones which do not require a large space for stocking. At this point integration takes place as the main technique for continuous analysis of goods' costs at warehouse. Continuous analysis is necessary to create product flow to avoid price losing and stickers (unnecessary storage of product). Moreover, analysis provides the stability of pricing for a certain type of product.

5.1.3 Inventory keeping and drop-shipping

Do you keep inventory or operate as a drop-shipper? (5 responses)

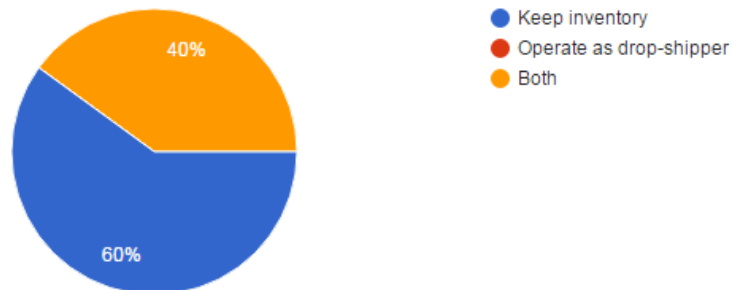


Figure 7 Drop-shipping and inventory keeping

Three out of five companies keep inventory and two companies use both options. Let us see the dependency between the amount of employees and storing option:

more than 100	Both
20-50	Keep inventory
10-20	Keep inventory
more than 100	Both
10-20	Keep inventory

It can be seen from Table 2 that only large companies are using drop shipping along with personal warehouse. Small sized companies prefer to keep inventory. Talking about drop-shipping we say that drop-shipping goods that are not kept at a warehouse, have assets that are not connected to integration, those assets are quiet large. For instance, there is no extra-costs for transportation and storage. Every company is interested in development of relationships between the client and manufacturer. Well-organized drop-shipping channel brings good income. As I see, small companies drive for drop-shipping because drop-shipping is always an asset. My recommendation for small-sized companies is to start drop-shipping from partnership, develop competitive web-site(digital benchmarking) and organize safe distribution channel.

5.1.4 Latest warehousing tools

What are the latest warehousing tools/methods that you have applied to improve the efficiency of your warehouse(for example: bar-coding, RFID, 5s)?

(3 responses)

Assigning location for products
Bar coding. Inventory management system YMS
Motorola bar-code scanners connected to our software

Figure 8 Latest warehousing tools

The given question opens up important information about internal company operations, i.e. integration as a live instrument of company’s business recovery. One company assigns a certain location for every product. The second company utilizes bar-code scanners that improve receiving, counting and dispatch functions along with yard management system(YMS) software that improves the processes in the yard such as movement of trucks and trailers. YMS allows to control the movements and location of trailers in the yard to fill orders in an efficient manner. The third company uses bar-code scanners that bring benefits to already described processes upwards. One important note in that case is that bar-code scanners are useless without appropriate connected software.

Table 3 Size of the companies vs warehousing tools

more than 100	
20-50	Assigning location for products
10-20	Bar coding. Inventory management system YMS
more than 100	
10-20	Motorola bar-code scanners connected to our software

Interesting fact is that only small-sized companies in Europe gave answers on this question. That can follow us to two conclusions, either companies’ warehouse is very optimized that companies decided to skip question about latest techniques, or there are serious problems in the warehousing processes of large companies which might be the least to happen. Integration of warehousing processes as the main instrument for recovery of warehousing practices such as bar-coding. The third option can exist if those companies have large wholesale customers that get the products directly from manufacturer in large quantities and there is no need in physical storage. Also, in this question, cross-docking takes place because that might be that received products are directed straight to loading area as in happens in large retailers as Amazon and E-bay.

5.1.5 Counting and registering of goods

The fact that all five companies were using bar-code systems tells us that the companies are well automated in terms of warehouse management. In companies with large volumes bar-coding is an important part because then the warehouse management system is automated. Bar-coding and WMS are interconnected.

5.1.6 Automated conveyor system

How effective do you find automated conveyors system for putaway and storing processes?

(5 responses)

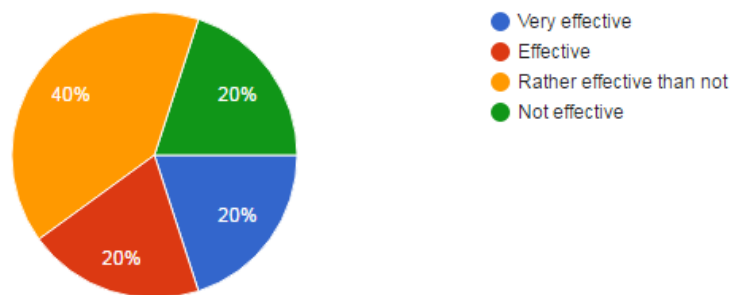


Figure 9 Automated conveyor system

Figure 12 illustrates that most companies found an automated conveyor system efficient and useful for their warehouses. Based on that, we can state that automated conveyors (automation) are efficient and useful practice for a warehouse. Integration and automation cannot exist without each other. Automation requires big amount of capital. For example, automobile concerns such as BMW and Land Rover can be a good example of business organized with conveyor systems, moreover, the capital resources are attracted from different countries, which make such business international.

5.1.7 Technology replacing conveyor system

If you do not use automated conveyor system, please, write down the technology(physical labour, mechanical equipment such as fork-lifts, pallet jacks etc.) which is used during receiving, putaway and storing processes?

(3 responses)

- Physical labor, manual forklift
- Physical labour and forklif
- Fork-lifts, pallet jacks

Figure 10 Replacement of automated conveyor system

The information to this question tells us that not all of the respondents were using an automated conveyor system. Three out of five respondents were using fork-lifts, pallet jacks and physical labour at their warehouses. Hence, fork-lifts and pallet-jacks had become a good replacement of automated conveyor system.

Table 4 Replacement of automated conveyor system vs the companies' size

more than 100	
20-50	Physical labor, manual forklift
10-20	Physical labour and forklif
more than 100	
10-20	Fork-lifts, pallet jacks

An interesting fact here is that large companies again skipped this question. Obviously, the three companies that were using physical labour and fork-lifts had also higher prices on their products than the ones that used automated conveyor systems.

5.1.8 The process of storing goods in general

All in all, most respondents were satisfied with the efficiency of the process of storing goods. Only one company saw weaknesses in warehousing. E.g. receiving process and product's execution on the market can be quiet long, which leads to the price drop due to physical and ethic obsoleting. With help of integration the process of storing products at warehouse becomes under control, but it is still the process of having higher prices on the products.

5.1.9 Zoning of a warehouse

How efficient do you find zonning of a warehouse approach(deep storage/pick up zone)?

(5 responses)

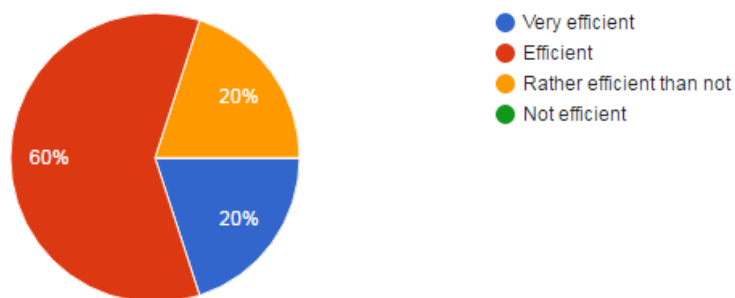


Figure 11 Zoning of a warehouse

All the respondents agreed that zoning of a warehouse is an efficient approach that brought benefits to warehousing processes. In regional warehouses with a low turnover it is effective to use the zoning of a warehouse approach, while in companies with a high turnover the best way is cross-docking and the conveyor system. For example, in Ikea the presentation of the products is on the 2nd and 3rd floors, while the actual warehouse is placed on the first floor for ease of use and access.

5.1.10 RFID system

How useful do you find RFID(radio frequency identification) system in your company?
(5 responses)

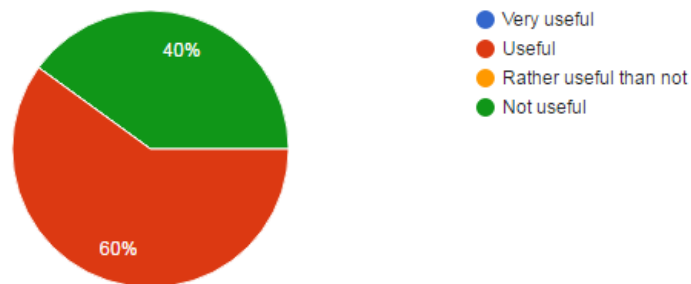


Figure 12 RFID

Unlike with bar-coding, the situation with the RFID system was different. In this survey, as can be seen in Figure 12, two out of five companies found the system useless. Let us take a look at which companies exactly found it useless:

Table 5 RFID utilization vs companies' size

more than 100	Useful
20-50	Not useful
10-20	Useful
more than 100	Useful
10-20	Not useful

One small and one medium sized company considered RFID as useless system for their warehouse. Possible reason for that might be in the product specification, for instance, if company supplies ground materials and there is no need in RFID at all. RFID is a good replacement for bar-coding. The usefulness and expedience of RFID is hidden in its informative function. It provides easier information flow through WMS than bar-coding. It saves time and resources, hence, RFID provides healthier pricing.

5.1.11 Cloud services

How valuable do you see cloud services for your WMS(Warehousing management system)?

(5 responses)

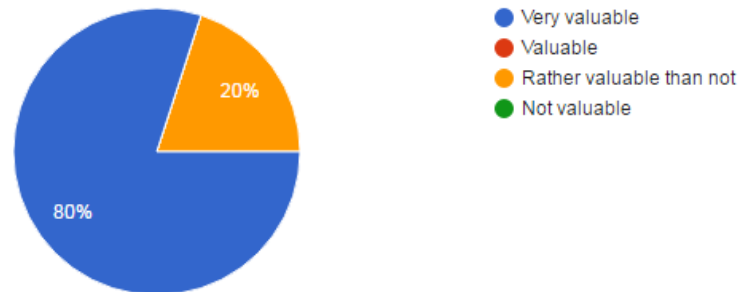
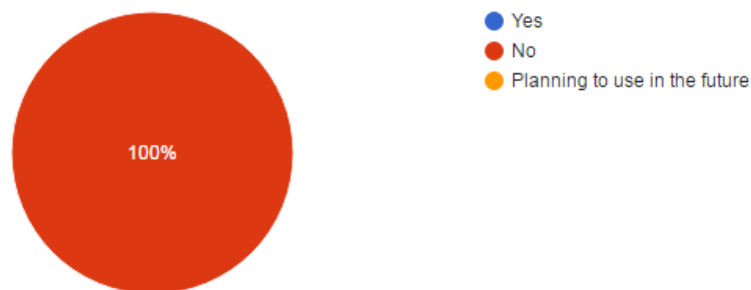


Figure 13 Cloud services

As illustrated by Figure 13, four out of five companies considered cloud services as essential and a valuable part of their WMS. That means that companies are worrying about how their data is stored and accessed. Capital is not spent on physical resources such as hard drive servers and IT maintenance of them. Information resources can be kept in limitless volumes. Capital resources have panoptic content, there is no wearing and pricing is not changed due to updating of physical resources such as computers and servers. There happens energy storage of information bank that provides high level of competitiveness. At this point, if you have large cloud bank with different types of business information and statistics, you can sell everything, including information. Such energetic-informational bank provides a clear path for future development of warehouses. Warehouse becomes digital storage of valuable information that can be sold for physical money or resources. There is no wearing of such energetic-informational banks. Such warehouses are always actual in every business field.

Do you use automated guided vehicle system(AGVS)? (5 responses)



5.1.12 Automated guided vehicle system(AGVS)

Figure 14 Automated guided vehicle system

None of the respondents is using AGVS possibly because it is the way too expensive. However, Amazon is successfully utilizing that system at the warehouse. Also, given system is used in the airports along with conveyor system because the price of loading the plane is directly depending on the speed. The same procedure happens in advanced railway depots.

5.1.13 Pick up points of the goods

How convenient do you find pick-up points of the goods? (5 responses)

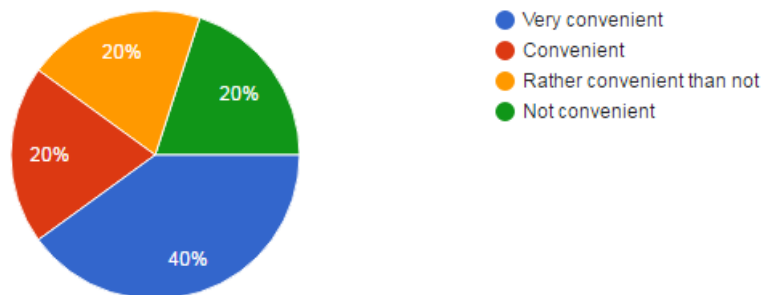


Figure 15 Pick up points of the goods

Most part of companies consider pick up points of the goods as convenient part of their delivery system. Indeed, this type of delivery has its advantages, for instance, it saves money since there is only exact delivery points – no need to deliver directly to customers. There is well-organized delivery process. Also, delivery points are located close to the customers.

5.1.14 Key performance indicators

Do you use KPI(key performance indicators) to assess the efficiency of logistics?

(5 responses)

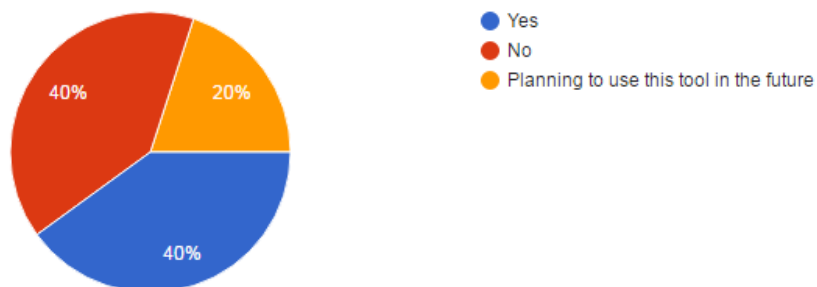


Figure 16 KPI

Half of the respondents are using KPI to assess the efficiency of logistics while another half is not using given tool at all. Only one company is planning to apply this tool in the nearest future, meaning that the company is still developing its processes to reach advanced level of logistics. KPI – is always analysis of production, its costs and benefits. KPI afford to detect weaknesses and develop healthy strategy for further development of integration processes. Some of these processes are working for future goals

while others concentrate on the current by creating sustainable development of the company.

5.1.15 Development strategy

Explain briefly your development strategy concerning warehouse for the next 5 years

(2 responses)

No
Improve current one and implement the allocation of zones of stored items.

Figure 17 Development strategy

Only 1 company out of 5 gave response for a given question. Nevertheless, it is good to know that the company has its own goals and planning to improve strategy and implement the zoning of warehouse technique. Strategy is a confidential element of every business and companies are not willing to share this information with public.

5.1.16 Short summary about warehousing practices in Europe

The situation with warehousing practices in Europe looks healthy. We were able to detect that companies are developing in terms of warehousing. Large retailers are using latest technologies, while small-sized companies are improving its processes by implementing different practices such as KPI. Barcoding became most common practice within the respondents. We conclude that integration along with economic processes became an essential part of every organization. By economic processes I mean the ability of effective use of integration processes. Creating cloud service or energetic-informational bank is the strategic goal of every organization that creates healthy development and sustainable climate inside it.

5.2 Current situation in Russia

The time for discussing best warehousing practices in Russia has come. This paragraph will be built in the same manner as previous one. The answers will be discussed and elaborated. The decision to make separate paragraph about Russian retailers is made not to get lost into details. By the end of this work we will make few parallels between European and Russian retailers, but before that, we need to go through situation in Russia. There were 10 out of 20 Russian companies that gave answers to my questionnaire.

5.2.1 Amount of employees versus amount of warehouse workers

There were five large-scale companies and five middle-sized companies in the sample. Based on the results, the more employees company has the more warehousing workers it employs. The statistics from the diagram confirms that fact.

5.2.2 Outsourcing or private warehouse

Nine out of ten companies are using own warehouse in their logistics processes. Only one company is using both options. That means that most part of companies prefer to keep inventory themselves. That option is a factor of long-term strategy that is costly in the beginning, but becomes profitable couple of years after.

5.2.3 The role of planning in terms of warehousing

Only six companies out of nine gave answer to the question about the role of planning in terms of warehousing. The first answer says that the company is purchasing the most demanded products for the coming year. The second answer says that the role of planning depends on supply. The third answer is quiet simple just saying "good". The fourth company sees the role of planning in optimization of costs. The fifth company says that planning is in high priority. The last company does not let shortage to happen. Based on that, we can make a conclusion that companies are thinking about planning of warehousing operations, which is a good fact.

5.2.4 Latest warehousing tools(RFID, Bar-coding, 5S, Lean management)

There is serious fish in the pond of companies that is using 5S, Total Productive Maintenance, RFID and SAP Extended Warehousing Management. The second company is planning to install bar-code system, but for now, there is none of the listed (RFID, Bar-coding, 5S, Lean management). One company is using bar-coding along with classification of racks by models. five companies are using just bar-code system and one company is using access to the warehouse by smart-cards.

5.2.5 Counting and registering of goods

Six out of nine companies are using bar-code system along with warehouse management system(WMS). two companies are using any other software for counting and registering of goods and two companies are using MS Excel.

5.2.6 Automated conveyor system

Three companies out of nine consider automated conveyor system as very effective instrument at the warehouse. Two companies think that a given system is just effective. Other three companies think that conveyors are rather effective than not, and two companies do not see conveyor system as effective tool at the warehouse.

5.2.7 Technology replacing conveyor system

Most part of companies are using physical labor along with pallet-jacks. There are only four companies that are using fork-lifts. That fact tells about companies' size and automation. In big companies it is convenient to use fork-lifts while at small and medium-sized enterprises pallet jack is enough.

5.2.8 The process of storing goods in general

Seven out of nine companies see the process of storing goods as advanced process. 3 companies marked that the process is not advanced at all. At least, they are honest and see their blind spots which is a good fact..

5.2.9 Zoning of a warehouse

The effectiveness of zoning of a warehouse is obvious and companies confirm that fact. One company marked that process as very effective, four companies think that zoning is just effective and other five companies consider that process as rather effective than not.

5.2.10 Efficiency of bar-code system

Five out of nine companies consider bar-code system as very efficient tool for their company. Two companies see bar-coding as just efficient and two companies marked it as rather efficient than not. Only one company sees bar-coding as not convenient tool. Based on the results we state that bar coding is efficient and convenient tool indeed.

5.2.11 RFID system

The situation with RFID system is different from bar-codes. The biggest portion of companies(five) consider RFID system as rather useful, than not, while two companies see that system as useless. One company marked it as very useful and one company marked it as just useful.

5.2.12 Cloud services

One company considers opportunity of cloud storage as very valuable, two companies marked it as just valuable, four companies marked it as rather valuable than not and three companies think that cloud services are not valuable tool for their company.

5.2.13 Automated guided vehicle system(AGVS)

Interesting fact is that three companies are using very costly and technically complex AGV system and seven companies are not using that system.

5.2.14 Pick up points of the goods

Nine companies consider pick-up points as convenient system for distribution purposes. Two companies see pick up points as very convenient establishment. Other Two companies see that system as just convenient and remaining five companies see that system as rather convenient than not, while 1 company consider that option as useless.

5.2.15 Automated pick-up terminals

There are four different opinions on topic about automated pick-up terminals. The largest part says that automated pick-up terminals are not profitable at all. Two companies marked that approach as very profitable, two as just profitable and 2 as rather profitable than not.

5.2.16 Key performance indicators

Five out of nine companies are not using KPI to assess the efficiency of logistics, while two companies are using that approach. Three companies are planning to use KPI in the nearest future.

5.2.17 Development strategy for the nearest 5 years

The first answer says that the person is not aware about development strategy and decision on that is discussed on the upper management level. The second answer says that the company is planning to apply better quality assessment before sending the product to the customer. The third answer describes that the company is planning to apply bar-code system along with system of automated records. The next answer tells that the company is planning to input more advanced system of process optimization and introduce more exact systems of tracking and storing of goods. The last answer says that the company is satisfied with current strategy and not planning to change it.

5.3 Short summary about best warehousing practices of Russian online retailers

Unlike European retailers, Russian online retailers are enough diverse to make clear analysis based on the results meaning that there were five large-sized companies in the sample and four middle-sized companies. Based on the statistics, we can clearly see that companies with over 100 employees are well-automated in terms of warehouse. Every big company is using bar-code system along with warehouse management system. However, middle-sized companies are not waiting outside, most part of them are developing and planning to apply such tools as bar-codes and KPI(the way how companies assess the achievements of its business objectives) in the nearest future. Some of them, companies, are planning to improve quality control, while others concentrate on tracking and storing issues. It is really good that companies shared their view on planning topics. Based on that, we can make conclusion that there is no limit in development process and different companies are situated on different steps of given process. Everyone wants its warehouse to be as automated as possible. As for me, it was a discovery that there were none companies from Europe that is using AGVS, but three companies from Russia, meaning that technology reached Russian side as well. In the beginning of this work I was thinking that Amazon is the only company that is using such technique.

6 CONCLUSIONS

Based on the results of the survey conducted and analyzed, we can make certain conclusions. It is a fact that integration plays an important role in the development of every company. From a warehousing point of view, integration always goes along with automation. By automation I mean application of different warehousing practices in the enterprise.

From the results we also observed that the future of warehouse logistics lies in the digital field called cloud services and energetic-informational banks. If once an enterprise applied a given bank, it can store anything starting from material goods ending with information.

In the 21st century information about materials plays same significant role as actual material. If you have certain statistics of material flow that can be analyzed, you can easily observe and change the direction your business goes to. The next step of such development process is pricing and by that I mean pricing not only for material goods but for information. By right analysis of information, you can create new techniques of integration processes that easily add value to your product and in the end, you can sell given techniques as your own practical approach. By analyzing warehousing procedures appears the need of arrogating to the product not only bar-code but the level of integration. With the help of modern processes of warehousing, important part takes the process of integration that contributes assets to production on time. Core competence of warehousing is to minimize storing time of products at warehouse; it is the most important factor. Every warehouse should have its own integration processes; otherwise, it will lose its assets. In 21 century, warehouse management should take into account energy-informational bank or cloud option for storing information and, as written above, selling it in a perfect case. Hopefully, internet provides all necessary tools for retailers for selling anything anywhere and anytime.

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APPENDIX FIGURES FOR STATISTICS FROM RUSSIAN SIDE

What is the amount of people working in your company?

10 responses

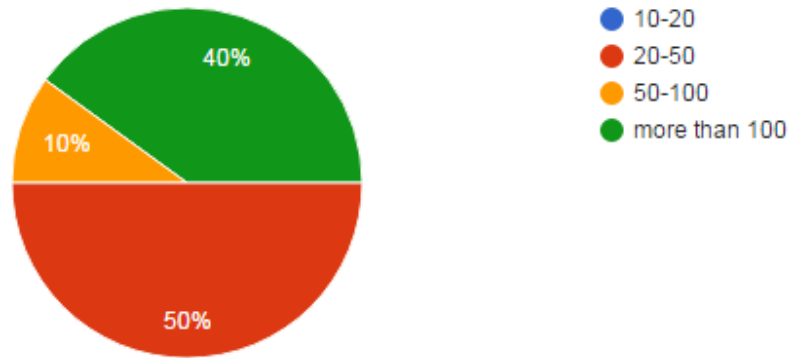


Figure 18 Amount of employees

What portion of employees are involved in warehouse activities?

10 responses

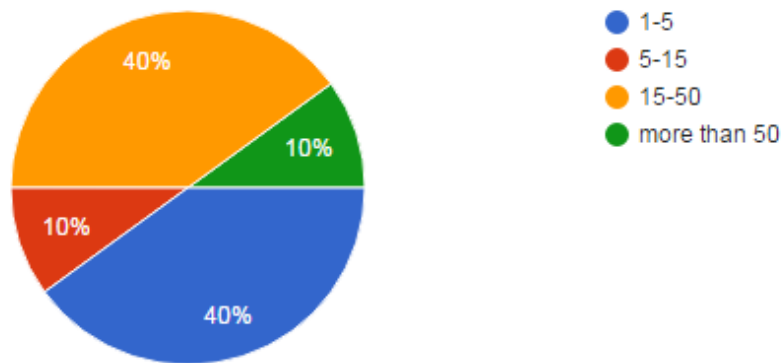


Figure 19 Amount of warehousing workers

Do you use your own warehouse or outsource it?

10 responses

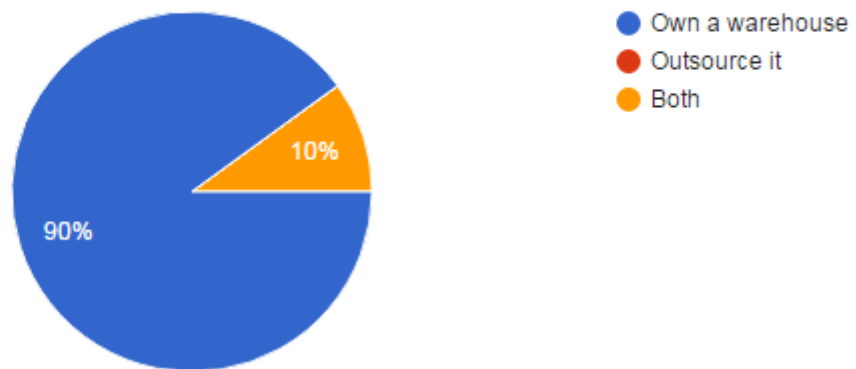


Figure 20 Outsourcing or own warehouse

Explain: how do you see the role of planning in terms of warehousing of your company

6 responses

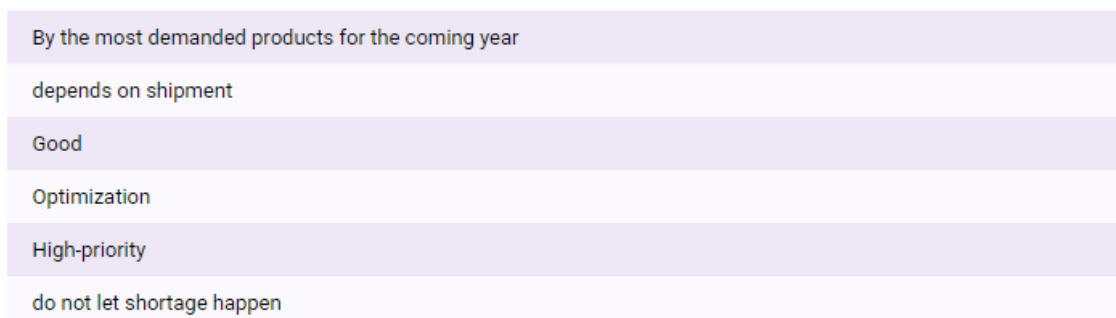


Figure 21 Role of planning in terms of warehousing

What are the latest warehousing tools/methods that you have applied to improve the efficiency of your warehouse(for example: bar-coding, RFID, 5s)?

9 responses

Bar-coding
Bar-coding
bar-coding
bar-coding
Bar-coding, sorting of stacks by models
Bar-codes are planned. At the moment, nothing from the above
Access by smart-cards
Bar-codes
5S, TPM, RFID, SAP EWM

Figure 22 Latest warehousing tools

How do you count and register received goods(goods receipt process)

10 responses

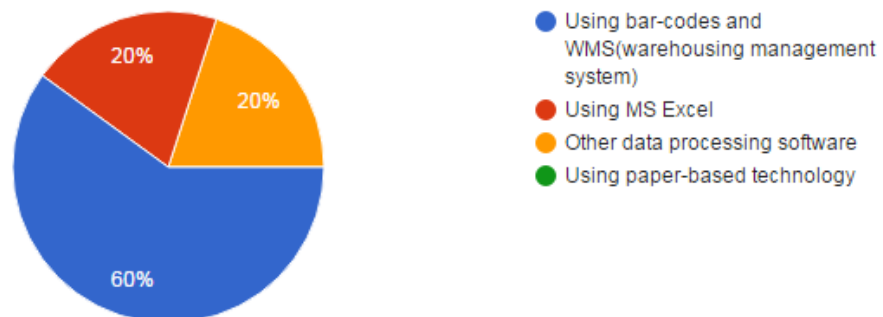


Figure 23 Counting and registering of goods

How effective do you find automated conveyors system for putaway and storing processes?

10 responses

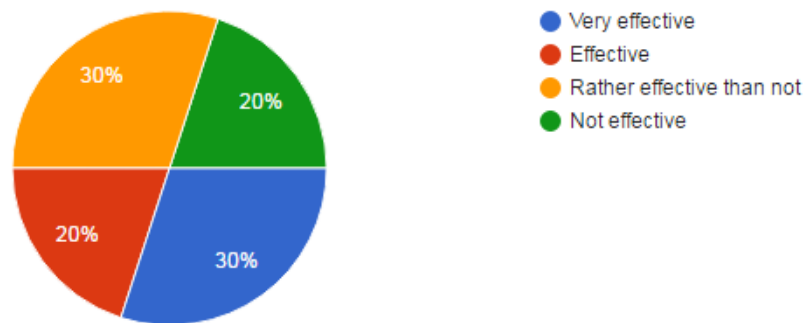


Figure 24 Automated conveyors system

If you do not use automated conveyor system, please, write down the technology(physical labour, mechanical equipment such as fork-lifts, pallet jacks etc.) which is used during receiving, putaway and storing processes?

9 responses

Physical labour
Physical labour
Physical labour, pallet-jacks
Physical labour, pallet-jacks
Delivery note- physical labour, pallet-jack - physical labour
Fork-lift
Physical labour+fork-lift
physical labour, pallet-jacks, fork-lifts
physical labour, pallet-jack, fork-lift

Figure 25 Replacement of automated conveyors

How advanced do you see your process of storing goods in general?

10 responses

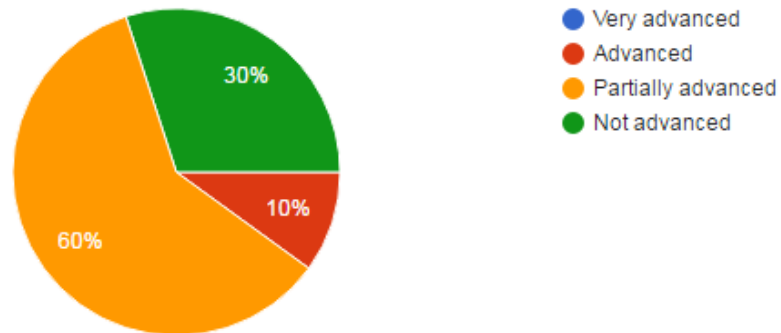


Figure 26 The process of storing goods in general

How efficient do you find zoning of a warehouse approach (deep storage/pick up zone)?

10 responses

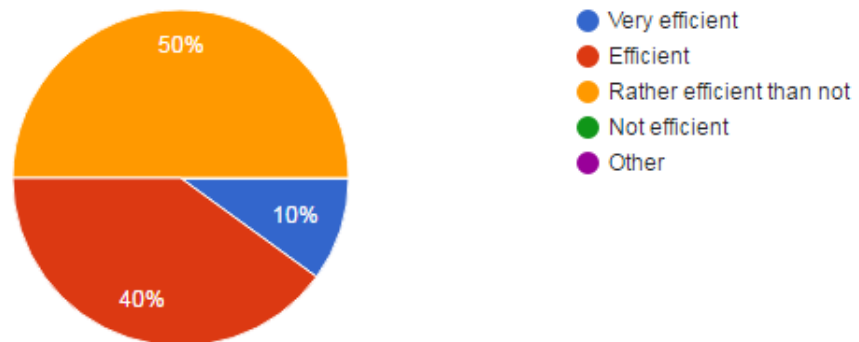


Figure 27 Zoning of warehouse approach

How convenient do you see the usage of bar-code system in your company?

10 responses

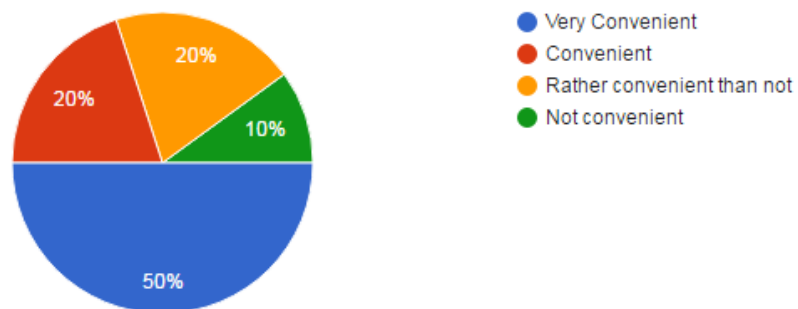


Figure 28 Convenience of bar-coding

How useful do you find RFID(radio frequency identification) system in your company?

9 responses

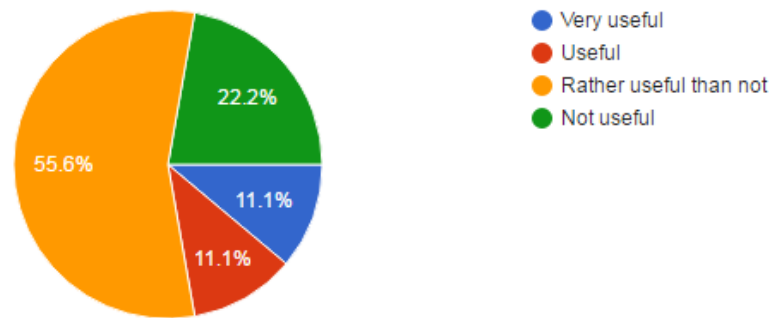


Figure 29 Usefulness of RFID

How valuable do you see cloud services for your WMS(Warehousing management system)?

10 responses

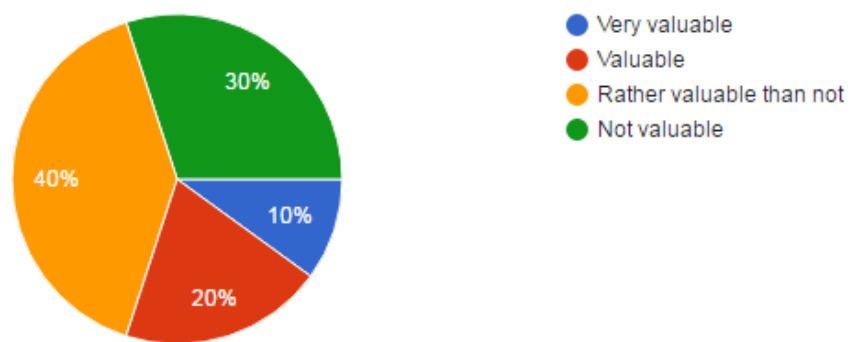


Figure 30 Value of cloud services

Do you use automated guided vehicle system(AGVS)?

10 responses

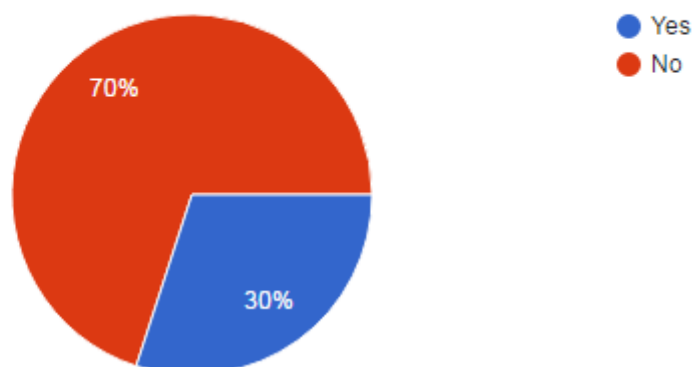


Figure 31 AGVS system

How convenient do you find pick-up points of the goods?

10 responses

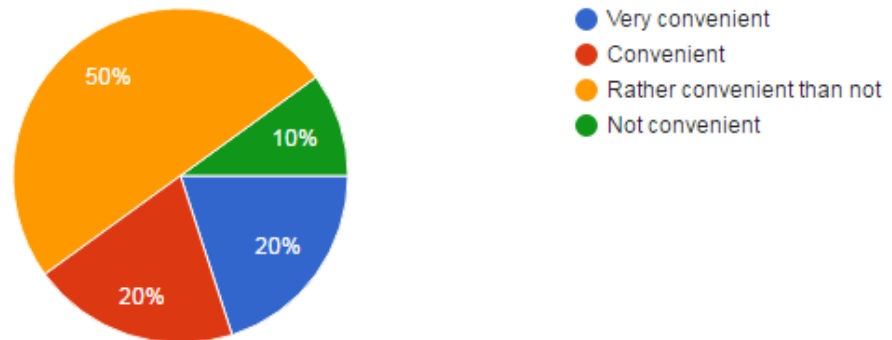


Figure 32 Pick-up points of the goods

How profitable do you find automated pick-up terminals approach in your company?

10 responses

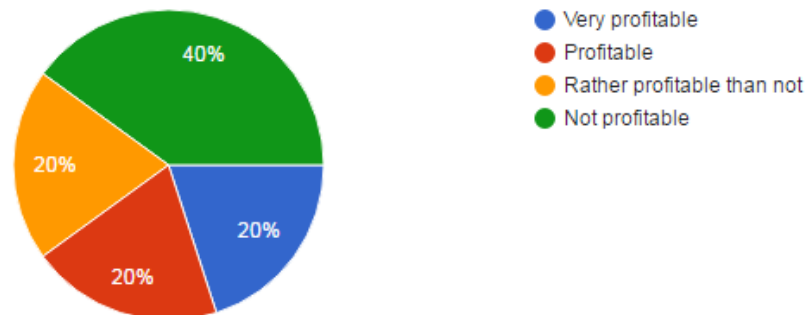


Figure 33 Automated pick-up terminals

Do you use KPI(key performance indicators) to assess the efficiency of logistics?

10 responses

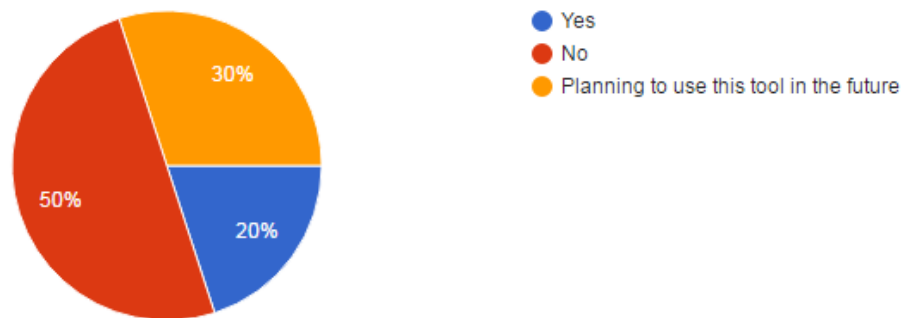


Figure 34 KPI

Explain briefly your development strategy concerning warehouse for the next 5 years

5 responses

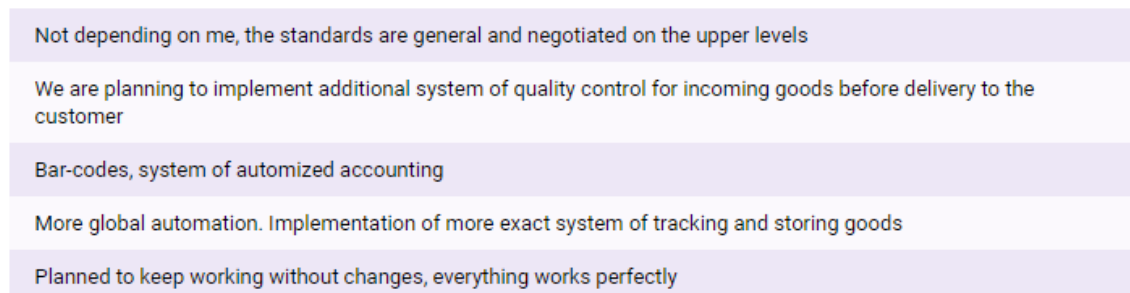


Figure 35 Development strategy for 5 years