

University of Economics, Prague

Bachelor's Thesis

2018

Islam Khovasov

University of Economics, Prague
Faculty of Business Administration
Bachelors' s Field: Corporate Finance and Management



Title of the Bachelor's Thesis:

SAP Business Suite in Procurement

Author: Islam Khovasov
Supervisor: Ing. Marek Vinš, Ph.D.

D e c l a r a t i o n o f A u t h e n t i c i t y

I hereby declare that the Bachelor's Thesis presented herein is my own work, or fully and specifically acknowledged wherever adapted from other sources. This work has not been published or submitted elsewhere for the requirement of a degree programme.

Prague, December 10, 2018

Signature

Title of the Bachelor's Thesis:

SAP Business Suite in Procurement

Abstract:

This Bachelor Thesis aims to present the modules, components and applications of SAP Business Suite in Procurement its tasks and functions with regard to external IT systems, transformation from classical SRM to Ariba software. The aim of this thesis is analysis and positioning of ERP procurement system market, including comparison of biggest rivals SAP and Oracle. Research conducted from technical side by analyzing advantages and disadvantages and also from customer side by interviewing employees of companies, which are using both softwares.

Research is aimed to implementation of Ariba software – it's challenges and outcomes with regards to Megapolis.

Key words:

Procurement, SCM, SAP ERP, Material management

Table of content

- INTRODUCTION 7
- THEORITICAL PART 8
- 1. DESCRIPTION OF SAP SYSTEM 8
 - 1.1 Brief information about SAP 8
 - 1.1.1 SAP ERP Material Management..... 9
 - 1.1.2 SAP Supply Chain Management..... 15
 - 1.1.3 SAP Supplier Network Collaboration (SNC)..... 19
 - 1.1.4 SAP Supplier Relation Management (SRM) 19
 - 1.2 Determination of requirements and external procurement..... 19
 - 1.3 Ordering, delivering and invoice verification 20
 - 1.3.1 Inbound delivery 21
 - 1.3.2 Outbound delivery..... 21
 - 1.3.3 Optimizing purchasing..... 21
 - 1.4 How SAP affect the society?..... 23
- PRACTICAL PART 26
- 2. ANALYSIS OF ERP PROCUREMENT SYSTEM MARKET 26
 - 2.1 Market trends 26
 - 2.2 ERP trends to observe in 2018..... 30
 - 2.3 Competitors in market, advantages and disadvantages 31
 - 2.4 Development of customer solution by applying SAP 36
 - 2.5 SAP ERP Challenges..... 37
 - 2.6 Comparison of SAP and Oracle from customer perspectives 38
- 3. Ariba – future of procurement 42
 - 3.1 SAP SRM to Ariba 42
 - 3.2 Ariba implementation to Megapolis (Russian wholesaler) 43
 - 3.3 Implementation process research 45
 - 3.3 Challenges of implementation 55
 - 3.4 System Information Security Requirements 56
 - 3.5 System Ergonomics Requirements 56

3.6	Requirements to the composition and content of works	57
3.7	Financial results	59
3.8	Final achievements	62
	CONCLUSION	64
	METHODOLOGY	65
	Theoretical part:.....	65
	Practical part:	65
	LITERATURE	67
	Annual Reports	68
	LIST OF FIGURES AND TABLES.....	70

INTRODUCTION

With the development of businesses, industries management of all processes and resources was difficult. There is a need of special tool to make it easy. Nowadays this tool is an ERP. ERP stands for Enterprise Resource Planning. It is a unified system that integrates all data and processes of a company. All processes were automated, and effect of human minimized in this system, only input any data and automated system gives relevant answer which is needed. Consider ERP the glue which binds the diverse computer frameworks for a large association. Regularly, every department would have its own particular framework streamlined for that division's specific undertakings. With ERP, every department still has its own framework, yet it can communicate and share data with all other departments of an organization very easily. The ERP programming functions like nearly a focal sensory system for a business. It gathers data about the action and condition of various divisions of the body corporate and makes this data accessible to different parts where it can be utilized productively. There are many companies which create ERP and sell to organizations. SAP is one of ERP vendors in market. SAP is the world leader in enterprise applications in terms of software and software-related service revenue.

The first chapter is the brief description of SAP. Operating modules of SAP business suite are described: material management, supply chain management, supplier relation management, and supplier network collaboration, their functions and operations. It can be said that the first chapter is the theoretical part of thesis.

The second chapter starts from EPR procurement market analysis covering period of last 5 years. Chapter encompasses generally calculations, statistical data and analyses, which were taken from annual reports of competitors and market researches - defining competitor's market share. SAP was compared to its biggest rival Oracle by analyzing advantages and disadvantages of software, implementation time and optimization procedures. To add value, competitor's end-users are interviewed, to compare competitors from customer perspectives.

My research question: "Is it worth to implement SAP Ariba software for business, specifically to company Megapolis? What are the challenges and what results were achieved?" described in the chapter 3. To answer this question, I had a chance to work with SAP's employee, who oversaw implementing Megapolis project.

Finally, the last part of the thesis is conclusion. In conclusion all theoretical, statistical data and information, calculations are summarized.

THEORITICAL PART

1. DESCRIPTION OF SAP SYSTEM

1.1 Brief information about SAP

SAP is ERP software and it is used by big companies, organization for managing their businesses. The acronym SAP means Systems, Applications, and Products. This system was founded by five engineers from Germany in 1972. System has different modules and each of them represents any part of business process. The modules of SAP are generally abbreviated according to the business process that they represent. For example, SD means Sales and Distribution, MM is stands for Material Management, or HCM that means Human Capital Management etc. All modules are very connected and integrated with each other. It means that when any data is entered, it can pass from all modules and give the result which is needed. This makes SAP very useful and beneficial as it decreases the probability of mistakes arising from repeated operations and waste of time. Managers and employers can easily decide as they have access to all important data and information because of the system.

ERP is a priority issue for SAP. A security gap that reveals basic information can possibly truly harm an organization's business, work force, resources, and brand prestige. It is imperative to screen all framework exercises for surprising and suspicious occurrences to avoid from attainable attacks, identify episodes, and respond before harm can be possible. SAP Enterprise Threat Detection empowers companies to recognize and determine potential dangers to distinguish critical attacks as they are going on, with the goal that proper countermeasures can be exercised in an opportune way to prevent damage to SAP's clients' business. The SAP Identity Management part encourages ventures to control client access to applications safely and proficiently. The program implements a central system to provisioning clients according their business roles. It additionally supports related procedures too, for example, secret key administration, self-service, etc.

SAP has an open architecture that helps IT specialists to integrate other important software to the system. Because of this advantage, nowadays a lot of companies use this system to manage their businesses. According to statistics SAP is the world leader in its field. There are over 15000 partner companies. In 2016 the total revenue of SAP was 22.06 billion. It is a global organization and people from more than 150 nationalities work in SAP. (*History of SAP*,2017)

CSR is one of the main elements of SAP and it approaches corporate social duty deliberately – so as to guarantee an economical future of company, its customers, and the society. It attempts to give the world's childhood the abilities they have to handle society's issues and grow in the advanced economy. Utilizing their representatives' talents, innovation, and their NGO cooperation, SAP works to improve instructional, entrepreneurial chances and opportunities for teenagers around the globe. SAP's vision is to assist the world be better and enhance individuals' life.

The primary component of SAP items is my SAP Business Suite. It is made from different parts that will be clarified. Clients may order entire my SAP Business ERP or simply the parts appropriate for their business. Parts:

- My SAP CRM – it expands the standard ERP capacities and procedures that is related with the clients. CRM means Customer Relationship Management.
- My SAP SRM – it expands the procedures related with the suppliers, such as web-based business. It remains for Supplier Relationship Management.
- My SAP PLM – it alludes to the capacities about lifecycle of products, like the management of the production-Product Lifecycle Management.
- My SAP ERP – it includes all the ERP capacities in the given modules: Finances, HR, Production Planning, Project Systems, Material Management, Quality Management, Controlling, Basis and Sales, and Distribution. (Kappauf, J., Lauterbach, B., & Koch, M, 2014)

1.1.1 SAP ERP Material Management

Material management plays very important role in business process. Business process is considered and termed as “module” in SAP. There are different function and roles of SAP MM (Material Management) in a module:

- It is a unit of logistics function and it assists to control procurement activities
- Supports all forms of MM (arranging, managing, etc.)
- Helps to consolidate the modules like storage management, production planning, sales and distribution etc.

Each association has some system or structure as indicated by which the entire business runs. A business system is the structure that symbolizes business in the SAP ERP framework. It is subdivided into different hierarchical units which are for legitimate reasons or business-related reasons gathered together. A business structure characterizes different levels in an association. These levels are set by some progressive system. Each level has some usefulness related with it. Furthermore, a business structure characterizes different hierarchical units that are available in an enterprise. The hierarchical (organizational) structure in MM consists of these levels:

- Client
- Company Code
- Plant
- Warehouse Location
- Purchasing Organization
- Purchasing Group

Features of the client:

1. It has its own group of master data with autonomous table sets.
2. According to chain of command, a client possesses the peak level in a SAP framework.
3. Data that is kept up at the customer level is substantial for every single hierarchical level.

Features of a company code:

1. Within client, an organization code is a free bookkeeping unit.
2. It is a legal substance that has its own benefit, loss and balance explanation.
3. It is the smallest unit in a company for which a total autonomous account set can be duplicated.

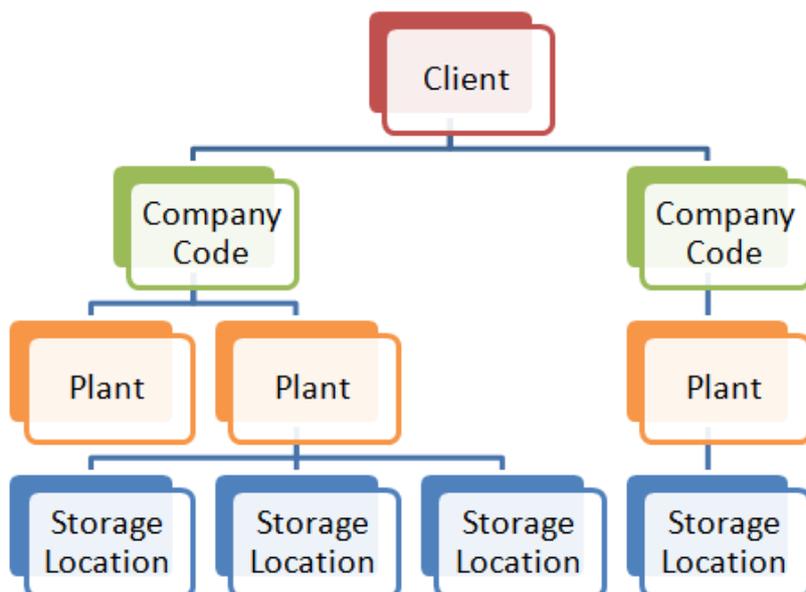
The main features of plant are:

1. Plant is a hierarchical unit inside an organization where exercises occur. A plant will make products and make goods accessible for the organization.
2. It is a unit having producing office, storage distribution center, or a provincial sales point inside logistic. (BENNETT, CRAIG, 2017)

Storage area is a hierarchical unit, which really separates between diverse material stocks in a plant. The features of storage location:

1. Storage area is where stock is stored physically.
2. Several storage areas can be located in plant. All information is kept at storage area level for a specific stockpiling area.

Figure 1.1 SAP Material Management Modules.



Note. SAP MM Tutorial - SAP Material Management Training Tutorial, (2017)

The followings are the features of purchasing organization:

1. A purchasing association is a hierarchical unit under an organization or a plant that is in charge of the procurement exercises as indicated by prerequisites. It is in charge of external procurement.
2. A procurement association may be at the client level that is considered as a centralized purchasing association.
3. A purchasing association can be at the organization or plant level too, that is known as organization-particular or plant-particular purchasing association.

All the hierarchical units joined together shape the structure of an organization. These hierarchical entities can be considered as various stages that portray the structure of a business. Each level has a specific usefulness related with it. Additionally, every level in either way is identified with each other. These stages are located according to some chain of importance, Company exists at the top. To build up a connection between these stages, we need to allocate them to one or other such that they already lie in a similar hierarchy. For instance: while company (organization) is at the top stage and plant is under it, it is fundamental issue that the plant has some connection with the company. While the plant is a sub-part or a lower separation of the company, plant will be appointed to the company. A regular SAP has the accompanying four fundamental and basic tasks:

- Plant to organization code
- Purchasing association to organization code
- Purchasing association to plant
- Standard purchasing association to plant

SAP R/3 operates on actual time information (data) as there is no time slack between information section and information accessibility. The vital thing while making any information is to keep up information trustworthiness. SAP R/3 information is arranged into as:

- Master data - Information that is made centrally and is substantial for all operations. It stays consistent after some time, yet we have to refresh it all the time.
- Transactional data - Information that is related with altering of business transaction

SAP Master Data is divided into two types: 1. Material Master Data and 2. Vendor Master Data. The main features that are important to mention about material master data are:

-This is the business primary source of material-particular information. This information will include data on the materials which an organization can procure, produce, store, or sell.

-Since there are varies departments in a business and every office operates any particular material, they will enter distinctive data according to their material. Because of this, every user division has its own aspect of the material master file. The information screens which are used to make material master can be classified as:

- Main Data: It contains essential information, purchasing information, and accounting information.

- Additional Data: It contains extra data, like, short characterization about material, currency, and so on.

Materials with some average properties are gathered together and they are appointed to a material form. It separates the materials and enables associations to control distinctive materials in a standardized way according to an organization's necessity. (Kappauf, J., Lauterbach, B., & Koch, M., 2014)

The main points and features that should be mentioned about vendor master are that firstly it is the business fundamental origin of vendor particular data and secondly it covers data on merchants from which an organization can obtain, procure or can offer, sell. Finally, a vendor master file includes data, like, seller's name, address, etc.

Information in a vendor master file is categorized into three classifications: the first category is "General Data" which means general information is kept up at the client stage and it is substantial for every single hierarchical level. The second one is "Accounting Data". It explains that accounting information is kept up at the company stage and it is substantial for all plants which are the part of that company. The last one is "Purchasing Data". This shows purchasing information that is kept up at the purchasing association level.

SAP R/3 takes a shot at all actual time information that covers material and vendor master. These are separate information files for maintaining data of materials and sellers from where material is acquired. The joined data of vendor and material as a whole is maintained in a file that is named as purchase information record. The main features and characteristics of this record are that purchasing data record keeps data on material and seller, providing that material. For instance, a seller's present price of a specific material is kept in information record; purchase information record can be kept up at the plant level or at the purchasing association level; information record can be kept up because of four procurement categories which are: 1. Standard that has data on standard requests (requests cover features of seller and material). This data record will cover seller's price for providing a specific material; 2. Subcontracting which has the data on subcontract requests. It contains price for gathering the raw material which is provided by the requesting party; 3. Pipeline has data on material which is supplied by seller through pipes. For instance, water, power, and so on; 4. Consignment has data on material which is stored at the premises of the requesting party. It includes seller's price that will be paid for pulling back material from a consignment stock.

The consolidated data of material and seller is stored in a file that is known as purchase information record. But a specific material can be requested from various vendors in various time intervals. This data can be stored in a list which is named as the source list. The main characteristics and features of this term are: 1. It contains a list of available sources of supply for a material according to a given time; 2. Source list determines the time duration of requesting a specific material from a given seller; 3. It can be duplicated starting with one plant then onto the next plant. Source list can be made with two ways: Automatically and Manually

Procurement in each association begins with assembling requirements. When requirements are collected, we have to notify the purchasing association. A Purchase Requisition is a report,

paper that holds a list of requirements. The main characteristics and features of purchase requisition are:

- It is an order which is made to the purchasing association to acquire the list of materials mentioned above.
- It is an inner report and stays inside the association.
- Purchase requisition requires confirmation from the purchasing association.
- In the case of confirmation of purchase requisition, it can be adjusted or edited just for a limited extend
- Purchase order can be made according to these procurement forms:
 1. Standard is getting completed material from seller;
 2. Subcontracting is supplying raw material to seller and getting completed material;
 3. Consignment means acquiring material that is stored in organization`s premises and paying to vendor because of that;
 4. Stock transfer happens in the case of obtaining material from inside the association;
 5. External administration is receiving services like support from an external vendor.

Decision making to choose the vendor is a vital procedure in the procurement cycle. While requirements are collected, we begin searching for available suppliers, providers who can satisfy the requirements with the most ideal price. Thus, an order is made to the sellers to show their quotations demonstrating the value of the material, their terms and conditions. This order is known as the request for quotation (RFQ). There are some features of RFQ: 1. It is a type of invitation which is sent to the sellers to demonstrate their price, term and conditions; 2. It includes brief information about goods or services, amount, date of shipment, and date of offer; Quotation is an answer by a vendor to RFQ. A RFQ can be made by two ways: Manually and automatically from a Purchase Requisition. (Kappauf, J., Lauterbach, B., & Koch, M. ,2014)

As mentioned before firstly company makes a shortlist of vendors. After this process, an association makes an agreement with specific seller to supply certain things with specific conditions. Formal contract is signed between a company and a vendor after an agreement. Thus, an outline agreement is a long-term purchasing concurrence with a merchant. The main points needed to mention about an outline agreement are:

- It is a long-term concurrence with a merchant including terms and conditions according to the material that will be provided by the seller;
- The terms are substantial up to a specific time interval and cover a specific predefined amount or price. It can be of created by these types: contract and scheduling agreement. Two types of contract are known:
- Quantity Contract is the type that the general value is indicated as the aggregate quantity of material to be provided by the merchant;
- Value Contract is the form that the general value is determined regarding the aggregate sum to be paid according that material to the merchant.

A specific material can be acquired from various merchants relying on the requirements. So, the aggregate requirement of a material is allocated to various sellers; the name of this process is quota arrangement. Quota arrangement separates the aggregate requirement of material among specific vendors. After this procedure quota for every source is appointed. This specific quota indicates the segment of material that will be acquired from an appointed merchant or source. Quota rating is applied to decide the quantity of material that will be appointed to a specific source. The source with the most minimal share rating performs as a valid source. This formula is used for calculation of quota rating:

$$\text{Quota rating} = (\text{Quota Allocated Quantity} + \text{Quota Base Quantity})/\text{Quota (1.1)}$$

In this formula Quota Allocated Quantity means the aggregate amount from all requests that is acquired from a specific source. Quota Base Quantity is the amount from a recent source of supply. Quota is the aggregate requirement of material which is given to a specific source.

There is also one concept which is called “posting period”. There are some documents that should be secured. In other case, any problem like posting improperly can affect the business negatively. These documents are purchase order, request for quotation, goods receipt and etc. which are very important and essential. This concept let us to post or edit the documents only in a specific period of time.

Another important detail in SAP material management is purchase order types. As we know, procurement process begins with the creation of purchase order which is a list of goods and services. According to various types of procurement, the purchase order can be made differently. In an ERP the procurement type is shown in a field which is called “item category”. Four purchase orders are classified:

1. Subcontracting Purchase Order;
2. Consignment Purchase Order;
3. Stock Transfer Order
4. Service Purchase Order

Inventory management is one of the fundamental elements of SAP MM. When we acquire the goods, it is also important to place them in a stock correctly. Because it is important to find them quickly and easily when we need to consume. Stock administration manages putting and taking care of the stock got from the merchants in right place inside the organization's premises. Inventory management manages the administration of stock, both on value or amount premise. All procedures related with movement goods like planning, entry or keeping records are managed by stock management. Goods movement makes an archive that refreshes all the stock amount and value in the stock which is called as the material document. There are some terms that related with inventory management. These are movement type, goods receipt, reservation and goods issue. Movement type represents the kind of stock posting in stock. Products receipt is the step where the material is taken by the requesting individual and its condition and quality

are confirmed. In some cases, stocks are blocked. The reason is making them accessible and available at a specific period of time. This is called reservation. Goods issue describes shifting a stock out of stock which might be because of a few reasons like pulling back of material for inspecting or returning the products back to the seller. A goods issue results a decline in amount in the stock. (Kappauf, J., Lauterbach, B., & Koch, M., 2014)

1.1.2 SAP Supply Chain Management

Supply SCM is one of the important modules of SAP ERP. Production planning, demand and business forecasting are managed by this module. SAP Supply Chain Management lets associations to operate successful arranging and execution of logistics inside supply network and to carry out work process management. Collaboration, planning, coordination and execution are components of SAP Supply Chain Management. Collaboration is utilized to support making cooperative forecasts and concurrences. Planning is utilized to produce the operational plans according to present and applicable information in the system. Coordination is used to arrange the exchange of information and data between various business units. Execution is used to guarantee that you carry out the supply chain plans in the most ideal way to get the desired outcome. By applying SCM in SAP, what benefits can organization achieve:

- Effectively controlling forecasting and taking care of unexpected changes in demand and supply.
- Effectively utilize NFA as plants and hardware. (NFA is Net Fixed Assets)
- Meet client requests correctly
- Proper stock improvement, request accomplishment, and delivery of the goods.
- Sharing of the key data to every partner spread over the system.
- Improve correspondence and joint effort between various business lines to control demand and supply procedure in an association.
- Develop production effectiveness and decline in production quality concerns and decrease cost of goods.
- Decrease transportation obligations and taxes. It additionally decreases transportation errors. (BENNETT, CRAIG, 2017)

Demand Management is another important element in SCM. This is used to forecast the future amount of demand and planning the production or procurement of goods. It helps to decrease the waste of place in stock of organization. Demand Management is accomplished by PIR. PIR is stands for Planned Independent Requirement. PIR supplies input to plan the production. There are two planning strategies: Make to Stock Planning Strategy(MTS) and Make to Order Planning(MTO) strategy. When there is no any sales order and you produce or procure only for stock for future demand, this is called Make to Stock Planning strategy. But if you do not produce until the order comes from customer, this strategy is known as Make to Order Planning.

There is a mechanism called as MRP which is utilized to fulfill demand and supply gap. MRP is stands for Material Requirement Planning. Issues and Receipts are known as MRP elements.

In SAP, we can make an arranged order request during arranging run for a factory to cause the procurement of material with the specific amount for a particular day and time. Arranged requests are made because of deficiency of materials that are set to inward acquisition, will make arranged requests and can change over arranged requests to production orders by T-Code: CO40/CO41.

A Production request is utilized to determine the material which will be produced, plant area where production should be done, the time of production, amount of goods needed. A Production Order additionally characterizes which elements and series of operations should be done. These are important stages in Production Order Admission:

- Initial step is to change over an arranged request to production order. When Production Order is making, type is characterized in SAP PP framework.
- To begin the production procedure, it is important to issue Production request. If the production order isn't discharged, execution process isn't begun.
- Issuing goods is needed for supplying the goods to carry out the Production order. While goods are issues, record number can be refreshed in the system.
- Every sub procedures are carried out as per expected tasks to affirm the production according to Production order.

According to production order, plants produce some goods. In this case raw materials are consumed. So, Goods Issue is applied. When we apply this element of SCM in SAP, system decreases the stock of components. For performing goods issue, MB1A T-code is used. If we want to confirm the production order, T-code CO15 should be used. T-code CO13 is used to cancel the operation.

The master data includes PPMs (stands for production process models), assets, material, and different items which are required to make SCM in SAP Supply Chain. Bills of Material (BOM), material master, routing and work center are fundamental items under the production procedure. Master Data includes the main features of these items as production order, material type, arranging requirements, goods issue and goods receipt. Bills of material (BOM) master data is identified with material requirement arranging and contributes the list of elements to make the product. For production of various variants of a product, Bills of Material which has the list of elements to fabricate distinctive variants of a good and selection of elements relies on details indicated in planning order can be made. Up to ninety-nine Bills of Material can be created. Material master includes data identified with various material types as finished product, raw material. Material master can be utilized for determining a product, purchase material, goods issue or goods receipt, product affirmation or MRP. Work center includes master information associated with routing of goods. It encompasses information identified with scheduling, capacity planning and production costing. Routing characterizes series of operations accomplished at work center. Routing is very important to compute production cost, engine and labor time. (Kappauf, J., Lauterbach, B., & Koch, M, 2014)

Resource type characterizes how the framework arrange resources according to the planning parameters. There are different arranging parameters for every resource type. While the transfer

of work centers from ERP system, these resource types are made automatically. Single-Activity is a type in which one operation can be done at once. In multi action resource, a few operations can be completed at one time. Single-Mixed and Multi Mixed Resources: In SAP SCM, we can utilize mixed resources to operate Production Planning and Detailed Scheduling, both the operations. Single mixed resource type determines that a single operation resources and multi-mixed resources let multi operation resources. Working time and rates of line are characterized by Line Resource type. A line resource is made in APO for every line we make in DI framework.

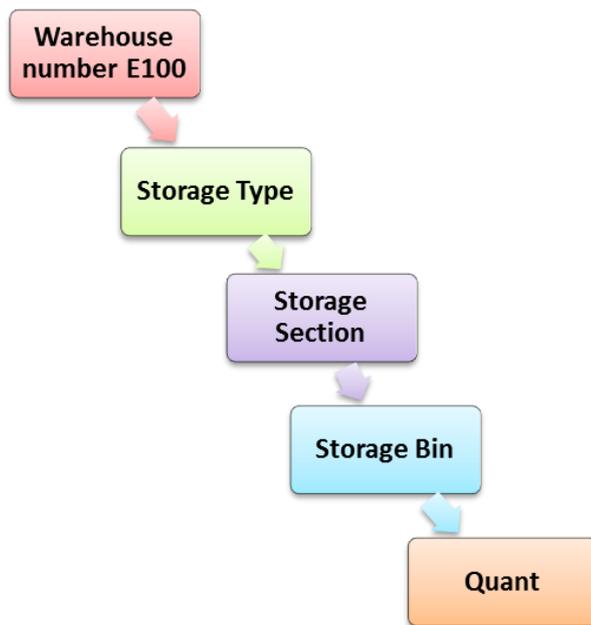
In SAP SCM, there are various applications which can be utilized for processing the requests or to record status of material, services and financial information. These are application categories in SCM:

- Advanced Planning and Optimization
- Extended Warehouse
- Transportation Management
- Supply Network Collaboration
- Forecasting and Replenishment

SAP Advanced Planning and Optimization contributes a scope of functions which can be utilized to arrange and execute the SC procedures in an association. It supports the mentioned features: We can utilize it to perform cooperation on a vital, strategic, and operational arranging level. It is utilized to perform the allocation between partners at all phases of the SC process. We can accomplish consistent optimization and assessment of the SC system's proficiency.

SAP Extended Warehouse Management (EWM) is utilized to proficiently control stock in Warehouse and supporting preparing of products movement. It lets organization to manage their Warehouse inbound and outbound procedures and movement of products in Warehouse. Incoming and outgoing materials, goods issue and goods receipt, accomplishing client orders, distribution of products and goods are the essential procedures in a Warehouse. Inbound procedure includes storage of products in warehouse and the location of these goods. Outbound procedure includes picking up the products. There are different features of this application. It manages all products movement and supports you with the instruments to monitor warehouse operations. SAP EWM governs extra functions in Warehouse as serial and batch number, seller management stock, resource optimization and lets us to not just control the number of products in Warehouse however monitor other important functions and shipment of products effectively. There is a difference between inventory and warehouse management. Inventory management gives information only about the number of products and goods stored but the physical location is not known. Warehouse management is the opposite of Inventory management and it manages products movement and controls the physical location of products recorded with particular documents. (Kappauf, J., Lauterbach, B., & Koch, M, 2014)

Figure 1.2 Organization units in a Warehouse system.



Note. SAP MM Tutorial - SAP Material Management Training Tutorials, (2017)

There are different organization units in a Warehouse system at various levels:

1. **Warehouse Number:** Every warehouse contains this number which is at the peak level in a warehouse management system (WMS). Every number includes sub structure which maps the relationship of warehouse.
2. **Storage Type:** There are various sorts of storage in which goods are physically stocked in a warehouse - open storage, products issue and products receipt, racks.
3. **Storage Section:** It is an element of storage type and shows a collection of bins with same qualities and features. Generally utilized storage sections are quick moving or moderate moving things, and so forth.
4. **Storage Bin:** Storage bins represent the physical location of storage space where the products are stored in Warehouse. They are at lowest level of organization structure and when you store an item in a Warehouse you need to mention its exact location.
5. **Activity Areas:** Storage bins are further categorized in activity area. It includes activities like picking, put away or a physical inventory. As per activity, you can assign same storage bin to multiple activity areas.
6. **Quant:** The quantity of goods in storage bin is represented by Quant. The quant is used for managing inventory in storage bin. (Linnéa Ahlskog, Matilda Edler, Camilla Holmgren, 2013)

Transportation management is another element of SCM. It is used under the application category-Advanced Planning and Optimization. The main and fundamental function is to arrange and execute all transportation process of company. Transportation planning/vehicle scheduling is used to control and manage this process. Some master data like 'customer', 'material', 'vendor' are created which are required for transportation management. Shipping points should be set in the system. (Kappauf, J., Lauterbach, B., & Koch, M., 2014)

1.1.3 SAP Supplier Network Collaboration (SNC)

Supply network collaboration can occur upstream between organization and providers(suppliers), and downstream and clients. Supplier collaboration effort indicates a cooperative business procedure in which one of the organizations is a manufacturer or client in a regular purchase-offer relationship. cooperative procedures and capacities in this connection occur between the manufacturer and its providers. With the expansion in globalization and outsourcing, provider cooperation has turned out to be significantly more complicated. For instance, a producer working with a few contract manufacturing providers can also cooperate with various providers too. Thus, some providers may not give goods to the manufacturer directly, yet to some other of its contract fabricating providers too. This makes an intricate web of cooperative associations which can make it troublesome for all parties required to share fundamental information about shipments, amount of supplies, quality, fabricating limit, and different components that effect productivity. Client cooperation incorporates the business procedures result when the producer is the seller or distributors, wholesalers or retailers are the clients. (Nieslanik, R.,2016)

1.1.4 SAP Supplier Relation Management (SRM)

SAP SRM (Supplier Relationship Management) is a product of SAP encourages the procurement of products by means of an electronic stage. Associations can acquire all kind of goods as direct and indirect material; services and it can be harmonized with SAP ERP modules and other non-SAP frameworks for bookkeeping and arranging. SAP SRM lets us to optimize our acquisition procedure to work successfully with providers to receive long term advantages and furthermore to perform estimating, forecasting procurement cycle and to work with allies. We can decrease the time interval and costing of acquirement cycle by using creative strategies to control business procedures with key providers. The entire procurement cycles. SAP SRM encourages us to highlight supplier performance management and support us to consolidate the procurement tasks, put consistence with contracts and acquiring policies, and enhance general cost administration and consumption. There are some benefits of SAP SRM for users: Catalog Management; Procure to Pay Optimization; Self Service Procurement; Reporting Functionality; Contract management. SRM has also some key and main functions like navigation, searching, purchase orders, account assignment, workflow (Ltd., SAP SRM Tutorial, 2016)

1.2 Determination of requirements and external procurement

Each association procures material or services to finish its business requirements. The mechanism toward purchasing materials and acquiring services from sellers or dealers is known

as procurement. The steps needed to acquire material shapes the procurement cycle. Each association carries out some regular steps that follow each other to acquire material in the correct amount at the correct cost. The essential and fundamental steps in the cycle are: Determination of Requirement; Establishing Purchase Request; Establishing Goods Receipt and Posting Invoice. (NASPO, 2013)

Determination of requirements is the initial phase in a procurement cycle. This is the logical subdivision, in which it is decided which material or services are needed by the organization, and which provider can satisfy the requirements. After decision the list of requirements is created and afterward it is confirmed by a senior power inside the association. After confirmation, a formal list is created which is known as the purchase order that is one up level of confirmation sent to the seller. External procurement is the procedure of acquiring products or services from outside merchants and sellers. Three fundamental types of external procurement commonly supported by the acquiring element of the IT framework:

- One-time requests are commonly utilized for material and services which are requested infrequently.
- Longer-term contracts with subsequent affair of discharge request is used for materials and services which are being requested frequently and in vast amounts, we can consult with the merchant (vendor) for pricing or cases and note them in a contract. The validate date is indicated in contract too
- Longer-term arranged agreements and shipment schedules occurs if a material is requested on an everyday premise and is to be conveyed according to additional time agenda, at that point we arrange a scheduling agreement.

1.3 Ordering, delivering and invoice verification

Purchase order is created after the determination of requirements and contains vital data, like, material name with its relating plant, main elements of purchasing association with the organization code, name of seller, and shipment date. After preparation of the purchase request, the vendor conveys the material to the requesting party and this procedure is known as Goods Receipt. This is the stage where the material is gotten by the requesting party and condition and quality of materials are checked. When the predefined quality of material is validated, a goods receipt is posted. After goods receipt, invoice is received from the seller and then the invoice is authenticated by the requesting party. It is the stage in which the vendor is paid from the organization and invoice reconciliation and purchase order is achieved. Each association procures products or services to finish the business needs. When products are acquired from a seller and put in organization's premises according to goods receipt, we must pay to the seller for the procured products and services. The amount of money should be paid with features of the goods is given by the seller as a report that is known as the invoice. Invoice should be verified before payment. This procedure is known as invoice verification. The main features of invoice verification:

- Invoice verification indicates the finish stage of procurement, after purchase order and goods receipt.
- Invoice posting refreshes all the relevant records in financials and bookkeeping.
- Blocked receipt which differs from real invoice can be treated over invoice verification.

There are these terms in invoice verification: Posting of Invoice; Blocked Invoice; Evaluated Receipt Settlement (ERS). Posting of invoice is executed when the products have received from the seller and the goods receipt have completed. Constantly the bookkeeping division can be unable to pay a seller according to the invoice raised. This is known as invoice blocking and caused due to: difference in amount at item stage and in quantity at item stage. Evaluated Receipt Settlement (ERS) is a simple technique for settling products receipt automatically. If the requesting party has concurred with the seller each finance related term and condition, in this situation it does not require to verify the invoice. (Ltd., SAP SRM Tutorial, 2016)

1.3.1 Inbound delivery

The inbound delivery mechanism begins when PO is prepared at the merchant and a propelled shipping warning is sent back. At the point when the notice is gotten, it can trigger an inbound conveyance to be made in SAP. The conveyance contains data on the vendor, the things, the amounts not out of the ordinary and the conveyance details. The shipment screen is utilized to show and process open and finished conveyances. It is a solitary list which is effortlessly checked on. It demonstrates the conveyances that are expected for picking or set away and the production of exchange orders, conveyances for which picked amounts or set away stocks should be affirmed and process conveyances that are expected for goods receipt. (Nieslanik, R.,2016)

1.3.2 Outbound delivery

The outbound delivery report is created to encourage the picking and pressing of the things as they are shipped to the client. The picking procedure includes moving things from the storage into the distribution center and arranging the amount in the picking region. The things are to be packed and after that sent to the client. The picking of things can be a computerized portion of the outbound delivery process or it can be performed physically. At the point when the distribution center staff finishes picking and takes it to the arranging territory, they can refresh the outbound delivery report to demonstrate that the picking has been finished. The shipment can be sent to the client by a logistics company. When the things leave the office, the delivery procedure is finished, and the goods issue can be posted.

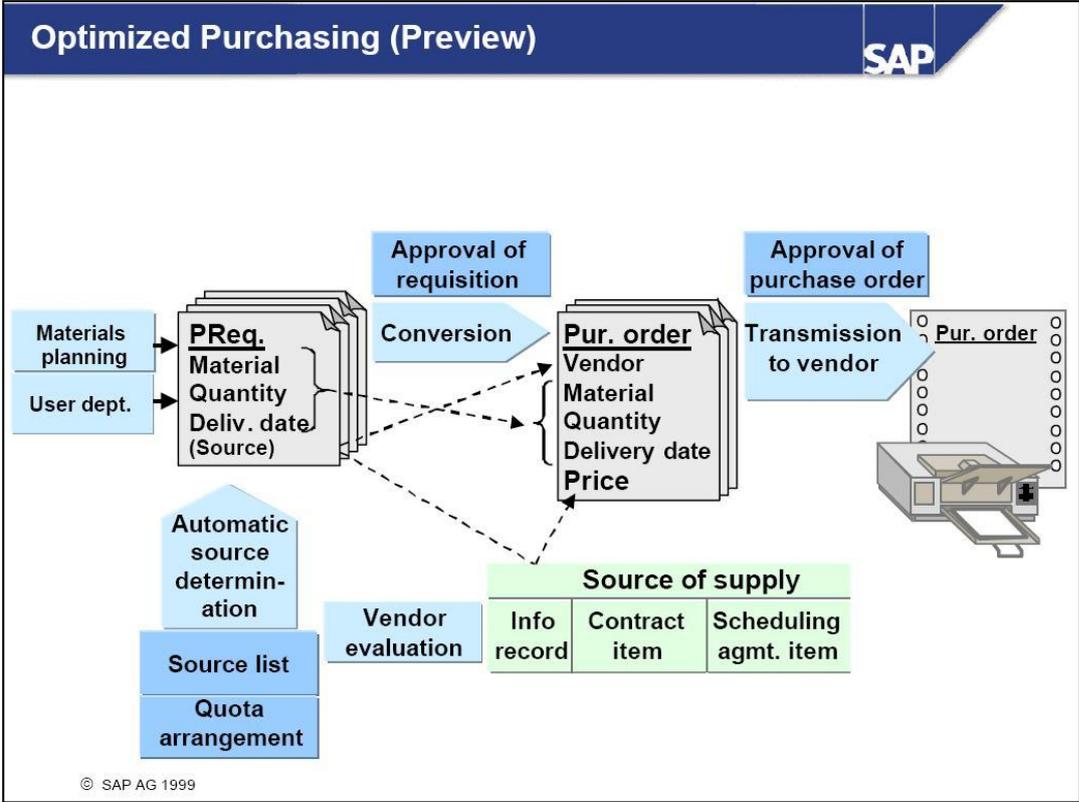
1.3.3 Optimizing purchasing

This function of SAP can be used to round off request amounts in Purchase Orders and contract discharge orders. It might be applied it to misuse the conditions consulted with your merchants to the full or accomplish ideal usage of existing transportation limits, for instance. In order

amount optimizing, the PO amount is rounded up or down as indicated by rules characterized in Customizing. Various units of measure can be considered amid this adjusting procedure. These rounding profiles can be used because of order quantity optimizing: (Nieslanik, 2016)

- Static rounding profile (Rounding up without change of unit of measure)
- Quantity addition/subtraction (Additions and subtractions of percentage without change of unit of measure)
- Dynamic rounding profile (Rounding up or down, considering different units of measure where important)

Figure 1.3 Optimized Purchasing



Note. SAP SCM APO SNC IB, (2016)

There are some important notes that we should consider. We can just apply static rounding profile while processing scheduling agreements. Before rounding, rounding profile must be introduced in the scheduling agreement and a source list record hailed as MRP-relevant with programmed schedule line should be created previously. The rounding of schedule lines of scheduling agreement happens when we execute a planning run for our independent requirements. The last scheduling line isn't considered in the rounding in scheduling agreement because of avoiding over delivery. (Farber, Dan. ,2015)

1.4 How SAP affect the society?

Senior vice president of SAP – Vivek Bapat: “By infusing our innovation into our purpose, we demonstrate the true impact of the SAP Brand. In 2017, SAP was ranked as the #20 most purposeful brand globally in the 2017 Fit for Purpose Index amongst all global brands in the 2017 BrandZ Report. On the purpose index, SAP is the highest-ranked technology company. There are many cases that we can say as an example for the affect of SAP in today`s society. Innovations of SAP are used in very important fields. SAP believes that computerized advances will empower organizations and associations to handle a portion of the world's most intricate, recalcitrant issues, like abolishing poverty; sparing the lives of the in excess of 6 million kids who don't live to see their fifth birthday celebrations; and diminishing worldwide CO₂ emissions by a third. SAP's opportunity is to give its clients, accomplices, and consumers with the devices they need an effect – from engaging the poor through money related administrations and giving customized drug, to building framework and battling environmental change. As a team with our clients and different associations, we are determined to convey on our higher goal for improving the world a, more beautiful place and at last enhance the lives of billions of individuals. Many interesting facts are given below about the usage and benefits of SAP products. (SAP, Kara Glencross, Dan Wellers)

Malnutrition influences a huge number of youngsters in developing countries that need essential resources for health. Edesia, a worldwide nutrition solutions organization, with the assistance of the SAP Business One application, oversees food distribution and above all supports youngsters in the most defenseless places of the world.

Esoko is a basic, but effective, communication device for organizations, government, NGOs, and others to associate with agriculturists. By running SAP Business One fueled by SAPHANA in the cloud in specific parts of Africa, Esoko is battling with poverty more adequately and effectively

The American Society of Clinical Oncology (ASCO) is utilizing enormous information, data and enhancing on the SAP HANA stage for CancerLinQ, that analyzes 850,000 electronic records of the health of patients to enable doctors to decide the medications prone to work best for every person.

The city of Buenos Aires is tormented by exuberant seasonal rains that cause floods which take lives and harm property. The city utilizes SAP HANA to predict or analyze climate information and 30,000 sensors over the city to recognize regions requiring quick help. Support groups utilize dashboards to clear depletes and counteract floods, save life of people.

Diabetes influences more than 347 million individuals, with add up to diabetes-related deaths anticipated to increment by half finished the following 10 years. SAP and Roche Diabetes Care's mobile application intends to battle the diabetes plague by enabling doctors to track a patient's advance continuously through a portable dashboard.

Alliander N.V. is the main energy distributor of the Netherlands that relies on keeping up protected and solid systems and overseeing dispersion to give energy service to more than 3.5 million clients. Alliander utilizes SAP HANA to accumulate and analyse monstrous measures of information to better look after resources, optimize its matrix, and enable clients to save money on their energy bills.

What began in the 1960s as a local business in the south of Brazil now sends out its hardware around the globe. Stara's agricultural devices incorporates frameworks which links sensors to SAP frameworks giving farmers continuous data. Through development, Stara's modern apparatus develop agriculturists' profitability, supporting Stara's objective to help all the more productively create food to sustain the planet.

The Amazon is home to native groups that assistance ensure the river basin and other forest resources, yet their inaccessible area makes them hard to reach. SAP's association with Fundação Amazonas Sustentável is improving the innovation and coordination that preservationists use to screen, secure and save the resources of the Amazon River Basin.

SAP is assessing opportunities around specific programming for clients in saving money, protection, public sector, utilities and some more. SAP is likewise exploring approaches to interface existing SAP arrangements and client scenes with the rising blockchain environment by means of the SAP Cloud Platform. Besides, blockchain is engaging for SAP clients dynamic in inventory network, fabricating, acquirement, item lifecycle administration and IoT situations. SAP has worked together with the Canadian bank ATB Financial, and fintech startup Ripple Labs to exchange 1,000 Canadian dollars (\$760) to a German bank in 20 seconds.

SAP and BMW companies are working with SAP HANA innovation to build up a commercial center of significant worth included administrations for drivers and an innovation stage to run them. In expansion, SAP collaborated with SEAT and Samsung Electronics on another associated auto idea that exhibited two situations: Digital Key, which gives the driver a chance to open an auto from a cell phone, and Park and Pay, through which drivers can discover, hold, and pay for parking spots.

SAP Digital Client Insight which is a first-of-its-kind offering created by the SAP Mobile Services group utilizing innovation from the honor winning venture form – Consumer Insight 365. It utilizes geolocation information generated by cell phones to enable organizations to answer inquiries regarding shopper socioeconomics and trends in any area. The information is collected and anonymized through a complex, patent-pending calculation. The information gave incorporates what number of buyers go through a picked area every hour, where they originate from, data about their statistic attributes, for example, age and sex dissemination, and the gadgets they're using. SAP Digital Consumer Insight is intended to be effortlessly consumable, and the low-cost point makes it an interesting offering in the commercial center. It is valued to be moderate to private ventures, yet organizations of any size will profit. It can be acquired with a credit card for a minimal cost for each report on sapstore.com.

SAP Business Objects Predictive Analytics enables ventures to make better and quicker forecasted outcomes, deliver device learning at scale utilizing a production line approach, and

bring prescient experiences to where individuals connect – in business procedures and applications. Some few examples: Groupe SAMSE which is a building materials merchant in France expanded direct marketing reaction rates by 220%. Monet is a payment supplier in France and decreased e-fraud over \$1B in a year. Covenant Transportation U.S. trucking firm diminished driver wearing down in an industry with 100% yearly turnover. Cox Communications U.S. cable supplier expanded campaign response 260%. MBank as a great bank in Poland envisions future request and gives pertinent offers to particular gatherings. Proximus which is a Belgian telecom lessened displaying time from months to days; quadrupled campaign reaction.

In 2015, around 25% of every single outside contract were viewed as "early abilities" as hires with proficient experience of up to two years. SAP has openly expressed a promise to accomplish a workforce of 25% ladies in administration before the finish of 2017. They have made incredible steps toward their objective and, as of year-end 2016, have achieved 24.5%. SAP gives clients innovation answers for enable them to move past bias. Their Autism at Work program, an activity that empowers individuals with Autism Spectrum Disorder (ASD), keeps on picking up energy and acknowledgment, with 116 representatives on the range utilized at SAP as of YE 2015. SAP innovation utilizes capable investigation that empower associations to gauge and provide details regarding inequity. SAP is raising the exchange by going past examination that recognize the issue and utilizing innovation to help distinguish potential inclination where and when it happens and before it turns into an issue.

Europe's greatest programming producer SAP has reserved € 2 billion (\$2.2 bln) for interests in items that assistance organizations to associate everything from clothes washers to autos to the Internet. The German organization said it would contribute that sum before the finish of 2020, focusing on what it assessments to be a €250 billion market in the purported Internet of Things (IoT), in which standard articles are associated with systems to send and get information. Such capacities are progressively utilized as a part of assembling and regions, for example, coordination's, computerized cultivating, automatons or 3D printing.

SAP did what needs to be done a week ago to work with German auto parts producer Robert Bosch to associate everything from screwdrivers to autos to the Internet, and more arrangements could take after. The organization will dispatch another product offering, named SAP IoT, which will join a lot of information from things associated with the Internet with machine learning and SAP's constant database S/4 HANA. "It is a major and developing business sector and we want to be a huge piece of it," said Tanja Rueckert, SAP's official VP accountable for advanced resources and Internet of Things. "While business and open part substances have remarkable access to more data and constant bolsters, despite everything they experience issues entwining everything," SAP said. By 2020, 21 billion IoT gadgets will be being used around the world, up from less than 5 billion a year ago, inquire about firm Gartner has evaluated. Rueckert said some portion of the €2 billion venture design would be saved for focused acquisitions, commonly little rush on bargains that fit in SAP's IoT portfolio. SAP said on Wednesday it had purchased Italy's PLAT.ONE and Fedem Technology from Norway for an undisclosed sum. The two acquisitions will be coordinated into SAP IoT. "We coordinate with Siemens, Dell, Intel, T-Systems and Vodafone among others. We converse with different

accomplices too. That is the bearing we will keep on looking at. To work with others in associations," Rueckert said. (REUTERS. (2016). SAP Plans to Invest \$2.2 Billion in the Internet of Things by 2020)

PRACTICAL PART

2. ANALYSIS OF ERP PROCUREMENT SYSTEM MARKET

ERP for procurement is a program or a system that lets a company to automate the procedures of purchasing materials and managing the stock of goods. ERPs for procurement can create purchase orders, carry out the requesting procedure on the web, match invoices with goods and materials received, or pay each bill electronically. elegantly composed procurement programming can execute these functions:

- Make a unique purchase order (PO) according to need, loaded from proper personnel.
- Confirm a PO with line items to be finished by a seller.
- Present a pending PO to proper staff for confirmation or dismissal.
- Mechanize electronic PO transmission.
- Generate reminders to approve POs
- Store a stock of products efficiently to avoid spot shortages.
- Carry out financial and stock related operations when materials arrive.
- Accumulate information and analyze trends to increase or develop profitability.
- Consolidate administration and standardization over various and multiple stages or platforms. (SAP SCM APO SNC IB. 2016)

2.1 Market trends

In 2016, about 56% of the worldwide Procurement applications market was shared by top 10 procurement software sellers. There was 2% increase in market share and the revenue was \$5 billion for these vendors. 26% market share was taken by SAP and the revenue was \$1.1 billion in procurement license, maintenance and subscription. Oracle was second in the market of procurement applications, and in the next places orderly were IBM, Coupa Software and Infor. In 2015, the market share leaders were in orderly SAP, Oracle, IBM, Infor. (Greenbaum, Joshua,2016)

The “Statistics Portal-Statista” made an investigation on market shares of procurement software vendors. The statistics of 2009-2016 are collected. According to these data I have created a calculation table to see the market shares of companies for each year separately. This table will help to analyze the trend of each company in market.

Market share can be easily calculated by this formula:

$$\text{Market share} = (\text{revenue} / \text{total-market-size}) \times 100$$

(Nickolas, S. ,2018)

Basically, need 2 main indicators: revenue of companies and total market size.

Total market size calculated

1. Determine the period to examine for each company investigated
 2. Calculate the company's total revenue (also called total sales)
 3. Find the total market sales
 4. Divide the target company's total revenue by the entire industry's total market sales.
- (Nickolas, S. ,2018)

According to STATISTA portal, in the year 2016 Enterprise resource planning software market revenues worldwide was valued at **82.3** billion U.S. dollars globally (Global ERP software market 2015-2021 Statistic, 2018)

SAP total revenue for year 2016 was 22.07 billion, when Oracle had 10.892. (Annual reports for year 2016, SAP, Oracle).

SAP market share = (22.07/82.3) - 26.8% of ERP market

Oracle market share = (10.892/82.3) - 13.2 %

Table 2. Market shares of procurement software vendors from 2009-2016

- Table 2.1. Revenue (2009-2016), billions, USD

(in billion USD)	2009	2010	2011	2012	2013	2014	2015	2016
SAP	10.67	12.46	14.26	16.30	16.82	17.56	20.80	22.07
Oracle	9.15	11.55	11.97	13.69	11.26	9.94	11.36	10.89
JDA Software	2.71	3.28	3.58	3.94	3.52	2.99	3.65	3.53
Manhattan Associates	0.98	1.31	1.29	1.50	1.34	1.29	1.67	1.65
Infor							0.79	1.81
Epicor				1.34	1.27	1.09	1.43	1.48
Ariba	2.00	2.36	3.39	2.99				
Others	29.09	34.51	36.76	38.88	36.16	35.19	39.70	40.90

(in billion USD)	2009	2010	2011	2012	2013	2014	2015	2016
SAP	10.67/54.17	12.46/65.6	14.26/71.65	16.30/78.7	16.82/70.35	17.56/68.062	20.8049/79.41	22.07/82.3
Oracle	9.15/54.17	11.55/65.6	11.97/71.65	13.69/78.7	11.26/70.35	9.93/68.062	11.36/79.41	10.892/82.3
JDA Software	2.71/54.17	3.28/65.6	3.58/71.65	3.94/78.7	3.52/70.35	2.994/68.062	3.65/79.41	3.53/82.3
Manhattan Associates	0.98/54.17	1.31/65.6	1.29/71.65	1.5/78.7	1.34	1.293/68.062	1.67/79.41	1.646/82.3
Infor							0.79/79.41	1.8106/82.3
Epicor				1.34/78.7	1.27/70.35	1.088/68.062	1.43/79.41	1.4814/82.3
Ariba	2/54.17	2.36/65.6	3.39/71.65	2.99/78.7				
Others	29.09/54.17	34.51/65.6	36.76/71.65	38.88/78.7	36.16/70.35	35.188/68.062	39.7/79.41	40.9031/82.3
Total industry	54.17	65.6	71.65	78.7	70.35	68.062	79.41	82.3

Note. Annual Report SAP (2009-2016), Annual Report Oracle Financial Services Software Limited (2009-2016), Annual report JDA Software (2009-2016), Annual report Manhattan Associates, 2009-2016), Annual report Infor Global Solutions (2009-2016), Annual report Epicor (2009-2016), Annual report Ariba (2009-2016)

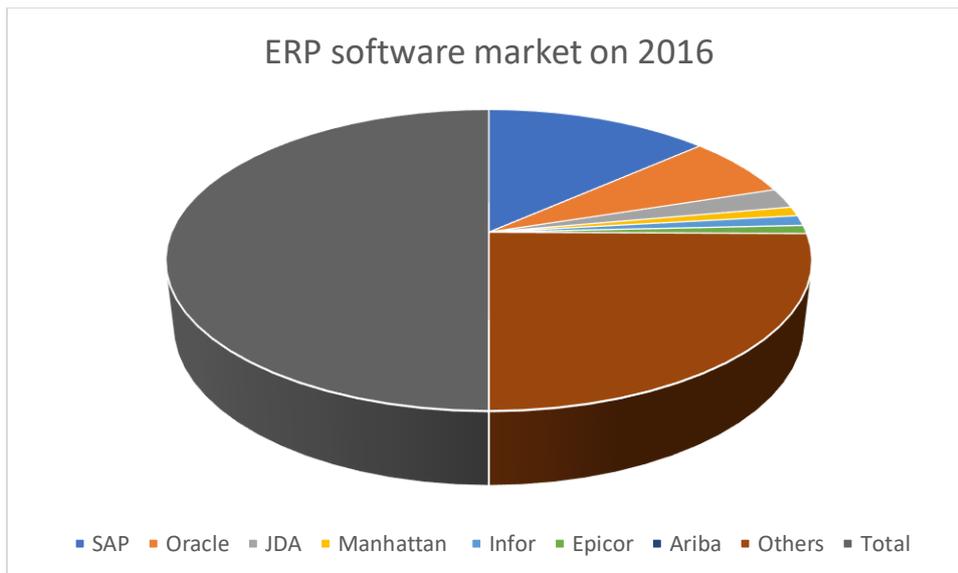
In above table, I divided annual revenue from the end of the year on total market size. Total market size from each year wasn't calculated, but taken from Global ERP software statistic research

- Table 2.2. Market share, in %

	2009	2010	2011	2012	2013	2014	2015	2016
SAP	19.7	19	19.9	20.7	23.9	25.8	26.2	26.8
Oracle	16.9	17.6	16.7	17.4	16	14.6	14.3	13.2
JDA Software	4.2	5.2	5.6	5.1	5	4.4	4.6	4.3
Manhattan Associates	1.8	2	1.8	1.9	1.9	1.9	2.1	2
Infor Global Solutions							1	2.2
Epicor				1.7	1.8	1.6	1.8	1.8
Ariba	3.7	3.6	4.7	3.8	ACQUIRED BY SAP			
Others	53.7	52.6	51.3	49.4	51.4	51.7	50	49.7
Total	100	100	100	100	100	100	100	100

Note. Global ERP software market 2015-2021, (2018), Annual Report SAP (2009-2016), Annual Report Oracle Financial Services Software Limited (2009-2016), Annual report JDA Software (2009-2016), Annual report Manhattan Associates, 2009-2016), Annual report Infor Global Solutions (2009-2016), Annual report Epicor (2009-2016), Annual report Ariba (2009-2016)

Figure 2.1. ERP software market on 2016



Note. According to Table 2.3.

According to given table we can observe that there is a increase in market share of SAP and decrease in others. It means that SAP started to get the customers of its rivals in market.

ERP sellers are delegated Tier I, II or III relying upon the sorts of customers they benefit. The three gatherings are extremely unmistakable and the size and many-sided quality of their solutions are additionally exceptionally distinct. (Panorama Consulting Solutions, 2017)

Normally the Industry groups a Tier I ERP merchant as one that offers broadly to the Tier I market – which has organizations with yearly incomes surpassing \$1 billion. These organizations are perpetually multinationals with a nearness in a wide range of geographic areas. Tier I ERP items have a high cost of possession because of their many-sided quality and expenses of usage and support. While there have been a few Tier I merchant prior, mergers and combinations have shrunk the list extensively. The rundown of Tier I ERP sellers is presently little and comprises of only two vendors – SAP and Oracle. Tier II merchants offer ERP items that suite mid-sized organizations that have incomes in the range of \$50 million to about \$1 billion. The results of Tier II sellers are particularly worked to deal with this market and consider some solitary or numerous areas of shipment. Normally, Tier II arrangements are simpler to oversee and support and cost correspondingly less also. Regularly, Tier II arrangements are restricted to an industry vertical. This gathering sees significant rivalry and is involved around 20 well known organizations. Tier III ERP solution suppliers target organizations that have incomes of \$10 million to \$50 million.

Oracle ERP Cloud offers a total, inventive, and demonstrated solution for associations of all sizes that need to flourish in the computerized economy. With industry principles and current prescribed procedures, Oracle is the one cloud for whole business. It oversees accounting, financial planning and analysis, income acknowledgment, risk management, reporting of tax and so on. Concerning venture cost, Oracle's was the costliest, with a normal of \$2.38 million.

(Bryla, B., & Loney, K. (2014). Oracle database 12c: The complete reference. New York: McGraw-Hill Education)

2.2 ERP trends to observe in 2018

Organizations that succeed through the limitations of the small sized business, and particularly those that develop within the borders of one nation can benefit tremendously from executing undertaking asset arranging (ERP) programming. A long way from being exclusively centered on financials, ERP can convey the software core for any business from client relationship management (CRM) even to stock administration and point-of-sale (POS). Furthermore, in light of the fact that every one of these segments are actualized in a modular fashion, ERP can give both a durable programming interface and in addition simply the altered usefulness your association needs.

In spite of the fact that ERP is one of the earlier segments of the business programming landscape, ERP sellers are reliably advancing to end up plainly more intense, more moderate, and less mind boggling. Mega-vendors, as Oracle and SAP have a dominant market share in ERP, yet newer organizations are pushing their way into the space with Software-as-a-Service (SaaS) choices that are changing the diversion. In this piece, we'll analyze the most critical trends to anticipate from the ERP business in 2018.

Conventional ERP applications are kept on servers, which show that you're in charge of forthright hardware costs, long-term hardware support and development, and information backup and recuperation. SaaS-based applications are kept on cloud-based servers, that are considerably less costly, significantly quicker to refresh and scale, and don't use any important office space. This distinction can mean a reserve fund of thousands of dollars as far as aggregate cost of possession (TCO).

In a few different businesses application sectors, including Customer Relations Management, Human Resources, and procurement, SaaS has turned into the default deployment version for new executions, as indicated by Forrester Research's report. For ERP frameworks, the report indicates, "the move to SaaS will quicken throughout the following three years and turn into the favored deployment alternative for lots of organizations. For big businesses, endorsement will be more limited close term, yet solutions are developing rapidly, and we will observe critical adoption at scale for large organizations inside five years." (GoForrester,2017)

If customer invested too much into seller's on-premises ERP device, at that point don't quickly escape to a similar merchant's SaaS item. Officeholder on-premises ERP seller may offer an appealing movement way to SaaS, as per Forrester's report, however it encouraged to "take care to comprehend the advantages and expenses of such an undertaking—and whether the new SaaS offering conveys important engineering, adaptability, and ease of use points of interest like items locally worked for SaaS." (GoForrester,2017)

Regularly, we can work with our seller to assemble a blended model, which gives us the adaptability to add new SaaS-based modules to our ERP item without starting sans preparation. For instance, if us on-premises ERP equipment works very well yet we want to add report management and CRM to the blend (without purchasing extra equipment), at that point we can plug SaaS modules over our current ERP. This is turning into a more prevalent alternative for clients, particularly as more business IT progresses toward becoming cloud-based. We should try to address our present seller or potential vendors to see whether this is an alternative.

In talking with ERP merchants, Forrester has discovered that businesses that have depended on-premises ERP historically are presently conveying SaaS-based equipment incrementally through the business. Instead of supplant ERP entire hoard, big organizations are picking one part of the business and connecting to SaaS ERP on a trial premise. This method gives organizations the chance to observe SaaS ERP execution to decide how it may fit into the current on-premises ERP usage, or whether it ought to supplant on-premises ERP all through the whole association. The report of Forrester states that "The two-level arrangement show empowers to quickly convey SaaS ERP in backup organizations while proceeding to run an on-premises corporate ERP. This model successfully quickens SaaS selection in littler to average size specialty units and may give a way to big business appropriation of SaaS ERP later" (GoForrester,2017)

As mentioned above, the ERP behemoths that have customarily ruled the business are confronting firm rivalry for SaaS-just new companies. Organizations like Financial Force (that was established in 2009 and right now has more than 1,300 ERP clients) and Kenandy (established in 2010) are building new methods on the Sales force App Cloud to make their solutions all the more engaging clients of the most well-known CRM and deals automation equipment. The Forrester states that "In evaluating the landscape of SaaS ERP sellers, significant contrasts among the 18 delegate merchants are found according to surveys in term of client appropriation, deployment choices, and go-to-market methodologies". What's particularly interesting about the newcomers recorded in the report is that they're focusing on huge venture clients as opposed of SMBs or small to midmarket clients.

As more gadgets and items associated and linked with the web, more information can be automatically channeled into the ERP framework. This help to better oversight over things, like, the SC, delivery partners, and performance of appliance. Outfitting this information could demonstrate gainful over all enterprises. Unfortunately, many items aren't associated or linked with the web and most organizations can't realize the projects. However, look to big businesses to start working out their Internet of Things (IoT) ecosystems and utilizing ERP devices to make a move on the information made by mentioned connection. (Panorama Consulting Solutions, 2017)

2.3 Competitors in market, advantages and disadvantages

Adaptability and flexibility is one of the advantages of SAP. SAP allows organizations to make their own particular standards inside the SAP structure. These guidelines set the parameters for satisfactory and inadmissible exchanges. For instance, the framework won't let a journal entry to execute if it doesn't balance. Organizations figure out which workers get access to each section in the SAP system. Just qualified employee gets access to staff information, like salary rates. SAP additionally has the adaptability to coordinate its information with an assortment of databases. Clients can download data into spreadsheets for advance investigation.

SAP lets organizations to control financial transactions, product life cycles and SCM. The program has different analytical highlights, as assessing execution, reporting, decision making. SAP can analyze information from any source and lead collective decision making. These features that mentioned above let SAP to carry out the needs, issues of organizations and government associations.

It is important to compare two market leader ERP software companies: SAP and Oracle. In this part I will give some important and noticeable information about these two companies according to Panorama Consulting's "Clash of the Titans" report. The report has been summarized according to hundreds of users of SAP and Oracle. What can we list for comparison?

Table 2.3. SAP vs Oracle

	SAP	Oracle
Execution of ERP programming	18.5 months	22.5 months
Risk of execution ERP	Higher	Lower
Aggregate cost of possession, yearly income	4%	1.7%

Note. Jutras, Cindy. (2014) "The Total Cost of ERP Ownership." Aberdeen Group. Retrieved from http://www.aberdeen.com/summary/report/enterprise_strategies/ES_ERP%20TOC_CJ_3572.asp.

High cost of acquiring and executing this program is disadvantage. The organization must buy the product and equipment important to run the projects far reaching. Expenses include labor expenses of internal IT representatives or outer specialists administering the procedure. Once the organization actualizes the product, representatives should be prepared. This includes preparing every worker in the capacities they approach. Continuous expenses contain

programming support and intermittent updates. Complexity is another disadvantage of SAP that incorporated with the product. Most organizations apply one component or capacity of the product at any given moment, letting representatives and workers to learn the product complexly before starting. The total usage process may take many years. As a conclusion we can list generally advantages and disadvantages of ERPs as:

- Optimization of processes in business entities.
- Exact and access to data on time.
- The capacity to share data among all segments of the association.
- Elimination of superfluous tasks and information.
- Decreasing waste of time and expenses of litigation
- The performance of all units of work which create their business together is increased because of better time management. Before ERP you already needed to make reports and take these reports from one department to another for example, but now the time people waste on such things is spent on different operations.

("Compare ERP System/ERP Software Solutions." Technology Evaluation Centers. (12 Nov. 2008). Retrieved from <http://erp.technologyevaluation.com/>)

Advantages listed above. Disadvantages are following:

- The establishment of the ERP framework is exorbitant. ERP advisors are extremely costly take around 60% of the financial plan.
- The achievement relies upon the abilities and experience of the workforce, including instruction and how to influence the framework to be executed correctly.
- Protection in sharing inner data among divisions can decrease the productivity of the program.
- The frameworks can be hard to utilize.
- It is difficult to train new employee, to teach work of system in the case of staff change
- Having an ERP framework has numerous favorable circumstances yet does not ensure the aggregate accomplishment of the organization. Authoritative culture, know how to include staff and foresee changes that will endure the association utilizing this arrangement of organization, are essential components for the consummation of the execution.
- The adequacy of the ERP framework may diminish if there is protection from share data between specialty units or divisions. Because of solid changes that execution of the ERP framework acquires the way of life of work, there might be inadequately prepared or unengaged in making utilization of a similar staff
- The perfection of the execution relies upon the capacity and ability of the workforce, additionally includes instruction and preparing, to make the framework is accurately connected.

(Greenbaum, Joshua, 2016)

What exactly disadvantages of SAP can be mentioned?

SAP has tremendous abilities and the organizations that had suggested the program did not utilize all the capacities that SAP served. SAP contributed with a substantially more brought together and organized way to deal with the buying capacity, contrasted with the past framework and this approach did not essentially fit the organization's needs. The general impression was that SAP was unyielding and the costs for adjust SAP to their purchase operations was substantially broader than figured. They likewise thought that it was negative that the data put in SAP should be right from the first time and to amend data it needs a prepared professional with specialist to roll out improvements. For example, if the buyer puts in a request in the program and wrongly write 5\$ instead of 500\$ and send the request, the buyer can't edit the mistake data by herself. It is costly because the professionals require intensive preparing and training. SAP is profoundly robotized, this can be negative because the data has been never checked for mistakes by a human hand. So, if a buyer composes 6 pieces instead of 60 pieces the firm can end up with to low stock values and not have the capacity to supply its clients. This is only one case of what can turn out badly when the information is automatically inputted. The application of SAP is expensive, and the product requires a larger number of experts than less intricate ERP frameworks. The adjustment of SAP with the goal that it should fit the clients' tasks and needs is an expensive task that should be finished by programming specialists. The knowledge isn't generally inside the organization and should be procured or outsourced that expands the cost. This is additionally a snag when it is up and running, the professional's level of information should be well created thinking about SAP because of its complicity (NASPO, 2013)

SAP and Oracle are long-standing competitors. And like any competitors, these two huge companies sometimes have different views on each other's products.

Now, there are 2 main solutions that companies offer - SAP with SAP HANA and Oracle solution with Times Ten.

Comparing the properties and functionality of database - Oracle is trying to compare the solutions of Times Ten and SAP HANA. They say that SAP HANA lacks feature and properties such as aggregate usage, multidimensional OLAP (MOLAP), indexes, support for NUMA etc. (Annual Report Oracle 2017)

Strengths of SAP are:

- The SAP HANA software and hardware complex includes a database that fully meets the requirements of ACID (atomicity, consistency, isolation, durability)
- The HANA database is completely located and operates in RAM, allowing very quickly to extract massive amounts of data, thereby solving the problems of Big Data, very relevant to date and in the future
- SAP HANA can end the need to use MOLAP, such structures for optimization, as indices, aggregates and views
- SAP HANA uses efficient parallelization algorithms between servers, which was proved by a test where 100 TB of data were distributed among 16 nodes, and a query to them returned results in less than a second.
- HANA is able to work with structured and unstructured data

- Oracle did not demonstrate the scalability of Exalytics and Times Ten solutions in excess of 1 TB, and publicly stated that the memory available for use with this configuration is approximately 300 GB
- HANA supports SQL standard ANSI, as well as MDX. Just as Oracle expanded the ANSI standard with the PL / SQL procedural language, SAP offered the SQLScript extension, which is a procedural language that allows writing programs with logic that can not be implemented on SQL
- HANA allows to store data on columns, by rows or combine these two methods. Oracle claims that it is first necessary to load the data into a line store, and then transfer it to a column store, which is really not the case at all. Also, in their opinion, to update the data, they must be moved back to the line store. But SAP HANA does not work in this way. (Greenbaum, Joshua,2016)
- SAP HANA supports analytical functions (for example, data marts), business functions, planning and forecasting functions (SAP BusinessObjects Predictive Analysis and Predictive Analytical Library in SAP HANA), and further SAP ERP is planned to be transferred to SAP HANA. In order to implement this in Exalytics, it will need Times Ten, Essbase, Endeca, Oracle DBMS, etc., which results in large profits for Oracle, but does not do much good for business. (Linnéa Ahlskog, Matilda Edler, Camilla Holmgren, 2013)

Comparison of pricing policy

Oracle has tried to publicly compare the pricing policies of Exalytics and SAP HANA, and the information they provide is distorted and misleading. In reality, not only the SAP HANA cost is lower than the Exalytics, but also the total cost of ownership of SAP HANA. Also, SAP does not force customers to purchase hardware from a single manufacturer at inflated prices, offering many options, such as servers from IBM, HP, DELL, Fujitsu, etc. Below is a list of facts about the SAP pricing policy in relation to SAP HANA:

- The cost of HANA includes everything that the client needs, while purchasing Oracle solutions, will need to pay not only licenses for the database and Exadata Software, but also licenses for Partitioning, OLAP, Diagnostics & Tuning Pack, Grid Control.
- The cost of SAP HANA includes support for SAP premium level, while Oracle requests for a separate amount
- The cost of Oracle solutions also does not include testing and development environments, unlike SAP HANA
- SAP HANA is effective when working at the deepest level of detail of data without the need to create indexes and aggregates, while for Exadata they are necessary to ensure the proper level of performance. They also take up space, that is, to pay extra amounts for "optimization" in the case of Exadata
- The functions of planning, forecasting, the library of business functions and text search are included in the cost of SAP HANA. Exadata does not support these critical functions without additional Oracle products

- Runtime versions of HANA (for example, Database Edition for BW) are significantly cheaper than Exadata and have a significantly better price / performance ratio
- The more SAP HANA modules customer purchases, the lower the price per module
- The minimum amount of SAP HANA available for purchase is 64 GB, while Oracle is obliged to purchase licenses for a quarter, half or a full hardware rack. (Linnéa Ahlskog, Matilda Edler, Camilla Holmgren, 2013)

2.4 Development of customer solution by applying SAP

It may be asked what the distinction is between tweaking SAP, upgrading SAP or making a bespoke client improvement. In general, the meaning of client improvement is as per the following: advancements that are to a great extent contained in the client's own improvement 'z namespace', and where 50%+ of their capacities have no reasonable SAP standard alternative. Regularly these contain self-developed information word reference objects, application programs furthermore, User Interfaces. Client improvements may incorporate references to SAP standard information and projects, nonetheless:

- The hidden business protests and procedures may not have a characterized association with a standard SAP process/work and additionally;
- The customer assesses that the hole between standard SAP also, the required business work offers enough an incentive to legitimize making their own answer. A few associations do not have a crucial comprehension of the advancement capacities of their SAP frameworks. Frequently they've actualized SAP for a capacity - ordinarily as a center Fund Management Information System. In this circumstance, the execution and progressing support for the SAP item regularly happen as a detached movement, isolate from different regions of task, including IT and now and again even those included in Enterprise and Solution Architecture. This sort of circumstance can mean key people have constrained comprehension of SAP's capacities. They in this manner center around the arrangements that they do know and are alright with. At times, SAP may indeed, even be a risk: a mind boggling and shut framework which is seen a greater amount of an obstacle to advancement rather than a device that can be utilized because of this objective. SAP and Soltius, as a SAP Gold Partner, have a key part to play in shutting this learning hole. This was perceived it a few years prior and thus started running standard learning classes and compositional sessions with our customers. It has been found, notwithstanding, that it can be troublesome for the key messages around SAP's abilities to reach past an association's current SAP clients, to those leaders that need to know the genuine energy of SAPs abilities. There's an abundance of online assets accessible on SAP advancement alternatives, however for some the sheer volume of material can be overwhelming. As it was once appropriately portrayed to me, looking on the web for help can resemble 'attempting to take a taste from a fire hydrant'. SAP innovation and industry gatherings give a fantastic expansion or contrasting option to this abundance of online material and are an awesome path for key individuals to get

educated up on SAP abilities, as well as trade thoughts and encounters with others from various associations. Be that as it may, they to a great extent center around SAP standard. (BENNETT, CRAIG, 2017)

2.5 SAP ERP Challenges

Price Complexity

Prices for SAP products are incredibly high and complex, consisting of various costs. One-time payments and yearly service fees (maintenance). Yearly services are usually agreed in the contract. SAP Business One starter package licenses are \$1400 per user as a 1-time cost, and \$410 per user/per year for a subscription. Even after overcoming obstacles to understanding the costs of purchasing software, customers must track several licensing indicators, such as role-based and named-user categories, use of licensing based on performance and equipment utilization for certain products. Other problems with pricing arise in the form of periodically changing licensing programs and product packages, unfavorable storage policies and complex policy interpretations for third-party "indirect use" offers. (Jutras, Cindy,2014)

Total Cost of Ownership (TOC) and Implementation

SAP implementation is a complex, multi-stage process that requires the consolidation of financial, technological and human resources. Until recently, customers had formed the notion that ERP solutions based on SAP are expensive tools that are available only to representatives of large and, rarely, medium-sized businesses. The strategy of SAP, aimed at increasing the availability of its solutions for a wider range of consumers, was launched in the late 2000s. To implement this strategy, solutions based on the experience of our company, adapted in the process of their implementation for the specific needs of the customer, were taken to the market considering the existing information space and the business processes used. The cost of SAP implementation in this case starts from 400 000 dollars, and the implementation period is from 7-8 to 9-12 months (incredibly long time)

The main cost elements for SAP implementation are:

- purchase of a software product (license);
- the costs of creating an infrastructure that ensures the system's operability;
- external consulting and payment for consultants;
- the content of its own system implementation team + staff training;
- software development;
- SAP - support

Cost of ownership is very high and implementation time is quite long.

(Jutras, Cindy, 2017)

2.6 Comparison of SAP and Oracle from customer perspectives

Pfizer employee using SAP and Oracle together

For overall comparison of both companies, I considered companies from customer's perspectives

In this part of thesis, I am going to ask Lenka Bockova several questions and make the survey, she works for Pfizer, in finance department

The company regular user of both softwares Oracle and SAP together

1. "Hello! Please tell me what is your name and role in Pfizer? How often are you using ERP software modules and what company provides it"

My name is Lenka. I work for Pfizer more than 2 years. Pfizer has shared-service office here in Prague, my role is accountant in Global Finance team.

Almost every day, mostly I use financial and logistic modules. We have several software providers: SAP, Oracle and Concur mainly.

2. "How would you rate SAP/ Oracle user-friendliness?"

I wouldn't say that one software is more user-friendly than other. It all depends on your habits, what do you personally prefer to use, what commands, layout, design.

But for newcomer, who just joined Pfizer, SAP is easy-learning platform that allows go very deep into the process. Oracle is quite advanced platform and not always clear to employees.

I would rate SAP for 9 out of 10, and Oracle 8 of 10

3. "What software, do you think is more suitable in your industry?"

First, it depends on what operation it concerned. Oracle has very good cloud solutions which are fully supported and automated. On the other hand, from ERP perspective SAP cores and modules are more efficient than Oracle ones.

For example, for travel expenses as air tickets and hotel accommodation fees we use Concur application owned by SAP.

Second point is that Pfizer is global company and for different regions/countries we have different software. Some regions are developed as Europe and America, new innovative solution might be implemented. But for some developing regions, it's too early to make big investments when you are simply not 100% sure about political stability

Our industry is pharmacy, we always need real time information on R&D, in order not to lose our competitors. That’s why we have a lot of separate modules from competitors.

4. “From customer point of view, which company is faster in aiding in the matter of urgency?”

Usually for every request from our side, they respond within 24 hours. It works for both companies, I wouldn’t highlight any of them.

5. “As last part of the interview, would it be possible for you to complete satisfaction survey, where 0 is lowest value and 10 is highest?”

Table 2.4. Customer Survey Pfizer employee

Question	SAP	Oracle
How likely is that you would recommend this company to a friend or colleague?	9	9
Overall, how satisfied or dissatisfied are you with ERP provider?	8	9
Which of following words would you use to describe company’s products? Examples: -Reliable -High quality -Useful -Unique -Good value for money -Overpriced -Impractical -Ineffective -Poor quality -Unreliable Etc.	-High quality -Overpriced	-Reliable -Impractical
How well do the products meet your needs?	8	7

How would you rate the quality of the products?	9	9
What are important features companies are missing? Examples: -Various types of surveys -Customer response -Easy navigation - Great HTML code -Design Etc.	-Design	-Easy navigation

Note. Lenka Bockova, personal communication (2018)

Bauerfeind employee using Oracle software

For more precise comparison, Peter Fischer – employee of German healthcare company Bauerfeind answered the same questions as Lenka. Similar industry was considered.

1. “Hello! Please tell me what is your name and role in Bauerfeind? How often are you using ERP software modules and what company provides it”

Good morning! I am Peter, working in logistic department for 6 years. Well, I currently use several logistic modules from Oracle ERP on daily-basis.

2. “How would you rate Oracle user-friendliness?”

Oracle’s software is quite understandable if the end-user graduates full trainings provided by Oracle. So, I would rate as 9 out of 10.

3. “As last part of the interview, would it be possible for you to complete satisfaction survey, where 0 is lowest value and 10 is highest?”

Table 2.5 Customer Survey Bauerfeind employee

Question	Oracle
How likely is that you would recommend this company to a friend or colleague?	9

Overall, how satisfied or dissatisfied are you with ERP provider?	9
Which of following words would you use to describe company's products? Examples: -Reliable -High quality -Useful -Unique -Good value for money -Overpriced -Impractical -Ineffective -Poor quality -Unreliable Etc.	-High quality -Unique
How well do the products meet your needs?	8
How would you rate the quality of the products?	9
What are important features companies are missing? Examples: -Various types of surveys -Customer response -Easy navigation - Great HTML code -Design Etc.	-Customer response -Effectiveness -Fast support

Note. Peter Fischer, personal communication (2018)

From interview with Lenka clearly seen that ERP software depends on the type of industry. In this case, for pharmaceutical company is not clear winner, they trying to combine 2 softwires which are perfectly working together. SAP has more points than Oracle, but the difference is very small. Although Bauerfeind uses only Oracle software, company got mostly 9 points, what is very high. Noted high quality and uniqueness of the product.

SAP built very strong brand and values that attracts solid number of customers, on the other hand Oracle is more reliable and fast-supporting. Although SAP is high-quality product, in Lenka's opinion, software is overpriced, when Oracle is very customer-orientated, but impractical in some points.

3. Ariba – future of procurement

As mentioned in chapter 2, the market share analyses demonstrated that SAP is the leader and the trend of this company is increasing year by year. Then I have forecasted the market share value of SAP in procurement for 2018. The result helped me to predict that at the end of 2018, the trend of SAP will increase again. These analyses which I did in my thesis or other companies do often shows the fact that customers increase every year. It is very great answer for the question which is asked in headline of chapter. But there is the other side. Competitors develops their services, programs, make an innovation every year too. So, there is still a rival between software vendors. This competition in the market is beneficial for customers use the ERPs for their business. Time by time they have chance to get high technological, smart software which make their business work easier. Because software vendors like SAP, Oracle, Infor, IBM etc. try to get more share from market.

If we want to look from SAP side, there are still things that SAP should solve. As mentioned in chapter 2 there are some disadvantages. SAP should change disadvantage to advantage for clients. Otherwise some share in market can be occupied by other competitor. This market develops very rapidly.

3.1 SAP SRM to Ariba

Classical SRM (Supplier Relationship Management) step by step transforming to Ariba software, which was acquired in May 2012 for 4.3\$Bn. One of the world's largest B2B network -around 1.3 companies with profiles

Ariba is designed to automate the management of customer procurement based on information technology.

By types of automated systems, the System refers to multifunctional software and hardware complexes for automating the processing of information in trade, material and technical support.

The system should provide automation of the tasks assigned to user groups involved in the procurement process of the Customer should provide the ability to exchange information with information systems involved in the management and monitoring of the procurement of goods, works, services.

The system automates the following processes:

- Consolidation of procurement needs;
- Processing purchase requisitions;
- Preparation and conduct of procurement procedures, including multi-stage procedures;
- Self-registration and accreditation of suppliers
- Supplier management.

(Ariba, S. (n.d.). Transform SRM)

3.2 Ariba implementation to Megapolis (Russian wholesaler)

Megapolis Group is a group of companies that owns and manages assets in the distribution and logistics of consumer goods, such as:

- tobacco products (including cigarettes, cigars, cigarillos, tobacco),
- soft drinks,
- groceries
- lighters
- batteries
- contraceptives
- energy, etc.

MEGAPOLIS Group of Companies includes:

1. MEGAPOLIS Trading Company JSC & Megacom LLC

“MEGAPOLIS Trading Company has direct contracts for the distribution of product the companies Japan Tobacco International, Philip Morris International, The Imperial Tobacco Group; distribution contracts with tea and coffee producers - Dauwe Egbert’s Master Blenders (Moccona) and M.J.F. Teas (Dilmah); distribution contract with the manufacturer of energy drinks Red Bull GmbH (Red Bull, Bullit); Megacom LLC is a long-term distribution agreement with the manufacturer of beer and soft drinks OJSC Baltika Breweries.

Also, TC MEGAPOLIS distributes lighters from Neska (Cricket), Flamagas S.A. (Clipper), Amatti, batteries from Samsung, Energizer, Kodak, Reckitt Benckiser products (Durex, Contex, Dettol, Silkoplast, etc.).

(n.d.). Retrieved from <https://www.gkm.ru/group/about/>)

2. Fortune Cigar House LLC

Cigar House Fortuna represents a wide range of alternative tobacco products (ATP) on the Russian market. The company is the general distributor in the Russian Federation of the world's leading manufacturers of cigars, cigarillos, hookah, cigarette, pipe tobacco and accessories for alternative smoking. A distinctive feature of the Cigar House Fortune is a wide range in all categories of the ATP market, as well as a balanced portfolio of the best global brands in each of the segments.

Relying on the developed federal network of the Trading Company Megapolis, Cigar House Fortuna offers a wide range of services for organizing the sale of products. The company's specialists make regular visits and deliver the goods to customers, provide specialized equipment for the storage and sale of ATPs, and provide qualified training on the rules for the sale and consumption of products.

Cigar House Fortuna has its own direct sales structure - 7 separate divisions located in Moscow, St. Petersburg, Novosibirsk, Yekaterinburg, Krasnodar, Kazan, Perm - and 23 regional ATP managers in the branches of the Megapolis shopping center. All warehouses of the company are equipped with humidor rooms - separate rooms where the necessary conditions for storing cigars are kept hand-rolled.

The company pays great attention to the training and education of its employees. For this purpose, special trainings on product knowledge and features of work with ATP are developed and conducted.

(n.d.). Retrieved from <https://www.gkm.ru/group/about/>)

3. Sovinteravtoservice PJSC

Sovinteravtoservice was established in 1978.

Today on the Russian market SOVINTERAVTOSERVIS represents the interests of various well-known world brands. Today PJSC SOVINTERAVTOSERVIS is the official dealer of six brands: DAF, IVECO, Fiat Professional, Ford Trucks, Isuzu and NEMAN buses (based on Iveco).

Sovinteravtoservice offers its customers a wide range of services in the field of sales and service of commercial and cargo transport:

- sale of cars and special equipment;
- vehicle maintenance at a modern and one of Russia's largest technical center and car service centers;

- fuel supply through its own fuel cards;
- versatile foreign economic activity.

Delivery of goods to more than 160,000 retail outlets throughout Russia is carried out by more than 3,300 own vehicles of the MEGAPOLIS Group of Companies.

The company has more than 300 branches from Kaliningrad to Petropavlovsk-Kamchatsky, which employs about 15 thousand people.

(n.d.). Retrieved from <https://www.gkm.ru/group/about/>)

3.3 Implementation process research

This research based on close cooperation with Sergey Kostiev (Moscow, Russia)– leading SAP IT specialist qualified for implementation Ariba software, specifically for wholesalers. He kindly provided necessary information, which was summarized and analyzed by me to answer the question “Is it worth to implement SAP Ariba software for business, specifically to company Megapolis? What are the challenges and what results were achieved?”.

Starting from the scratch, I would define the scope and plan to be done:

Table 3.1 Define the scope

Name	TC Megapolis Moscow, Russia
Industry	Wholesale distribution
Products and Services	Tobacco and fast-moving consumer goods
Employees	15000
Revenue	US\$ 12 billion
SAP solution	SAP Ariba sourcing solution

(S.V. Kostiev, personal communication, November 1, 2018)

Table 3.2 Challenges, and results

Challenges	Predicted results
-------------------	--------------------------

No centralized Procurement team	Enablement of Russian-language software
Spreadsheet -based processes	Integration of SAP modules used in another department
Manual processes, which are poorly interconnected with other departments	Easy supplier selection process
	One source of truth during procurement process

Note. S.V. Kostiev, personal communication (2018)

- Planning deadlines

Starting date: end of 2015

Finish and launch of module: first half of 2016

6 months

- The procedure for registration and presentation to the Customer of the results of work on the creation of the System

Requirements for the composition and presentation of work results are defined in the contract. The results of the work shall be transferred to the Customer in the manner specified by the Contract for the execution of works in accordance with the deadlines specified in contract.

Documentation on the System is transmitted on paper and machine media (CD / DVD) in one copy. Text documents transmitted on machine-readable media should be submitted in MS Office formats.

- Tasks of System

- Management, Work with the Customer's catalogs used for procurement, maintaining reference information;
- Formation Import of applications from the Customer's ERP system (1C¹), collection, consolidation of the Customer's needs, procurement planning;
- Management of work with suppliers, tracking of counterparties, archiving of data;
- Automate the selection of counterparties using procurement procedures;
- Evaluation of proposals of participants;
- Transfer of information on the results of the procurement procedure in the electronic document management system

(S.V. Kostiev, personal communication, November 1, 2018)

¹ 1C is an independent Russian software developer and publisher. Its headquarters are in Moscow, Russia. In Russian and CSI market is leader in business software with a share of 33% and compete with worldwide leader Sap

- General principles of creating a system

The system should be designed on the basis of the following principles:

Principle of conceptual unity

Organizational, technical, software, information and linguistic support should be implemented on the same system concepts defined for the System as a whole.

The principle of modularity

The principle of modularity should be ensured at the software level by isolating the tasks and sets of tasks to be automated with their decomposition by function. At the same time, the minimum necessary connections between automated task complexes should be determined in order to increase the reliability and performance of the subsystems, as well as their adaptability to changing external conditions.

The principle of openness

The system should be created in such a way as to ensure the possibility of integrating into its environment new subsystems and expanding the functions of existing subsystems due to the modular principle of their construction, as well as the use of internationally accepted standards for transmission rules (protocols, interfaces) and information storage.

The principle of multi-level

The system should have a layered architecture:

- the level of data acquisition - should provide informational interaction with the used DBMS;
- the level of functional data processing - must provide data processing in accordance with functional requirements;
- the level of visualization of the processed data - must provide a display of the processed data for the user. (S.V. Kostiev, personal communication, 2018)

Principle of authorized access to information

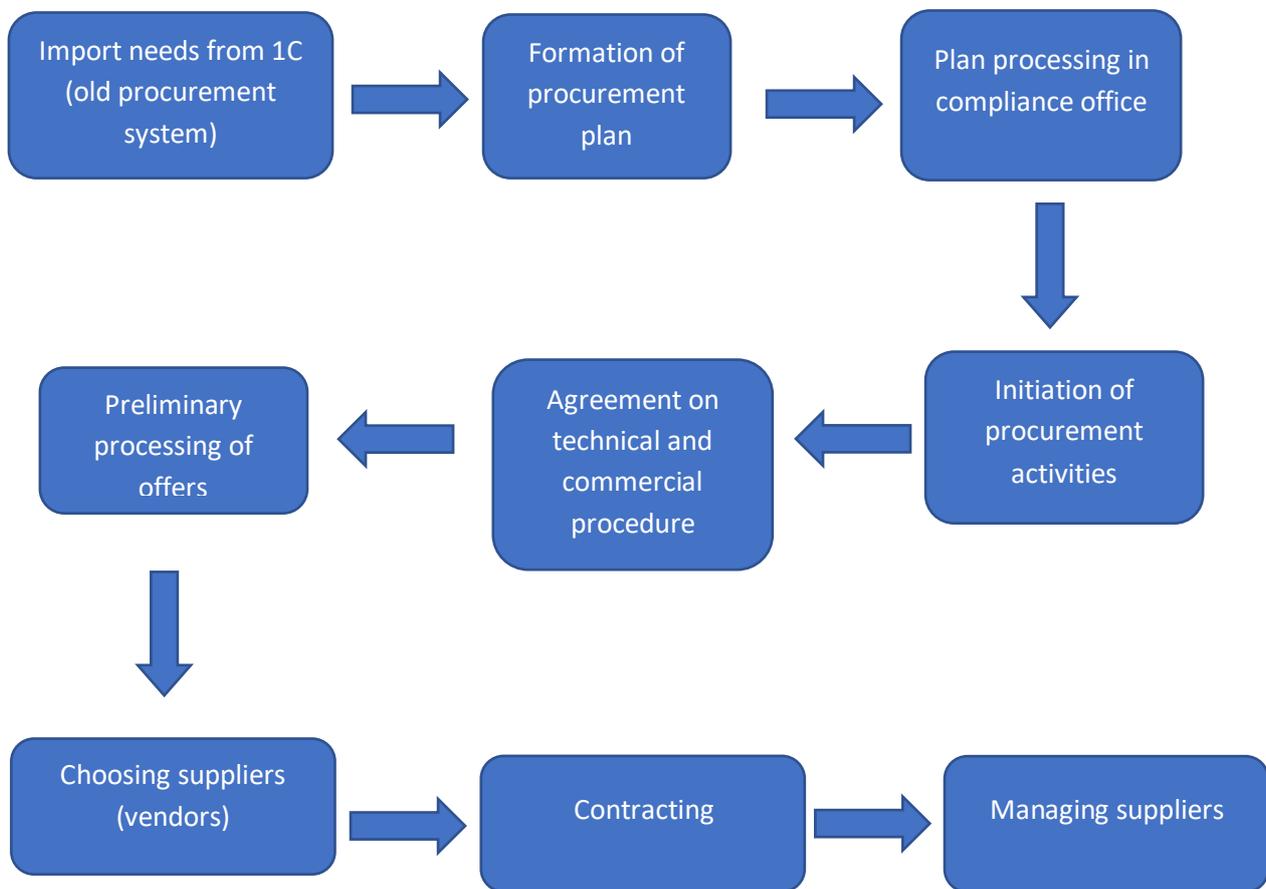
Must be implemented:

- separation of user access rights to documents generated during the preparation and publication of procurement;
- the ability to restrict user access to certain forms, form fields, as well as records and program logic. (S.V. Kostiev, personal communication, 2018)

- Description of the target business process

Figure 3.1 Business process

Process consists of 8 steps:



Note. S.V. Kostiev, personal communicatoin (2018)

Table 3.3. Implementation steps

	Process step	Process Task	Process description
1	Import needs from 1C	Shaping the need for an external system	Target Business process begins with the formation of needs in 1C, and then there is a load of the arisen needs in the system Ariba. The status update in 1c is performed by the download results. Requirements of the system contain necessary requisites: terms of Purchase, source of financing, Unit for which the
		Loading system requirements (routine, on demand)	

		<p>Status update in 1c</p> <p>Challenges:</p> <p>Legacy of documentation</p> <p>Composition of contract</p> <p>Missed data</p>	<p>purchase is carried out, address of delivery of required materials and/or services and other parameters, and also specification – List Goods/services for purchase, indicating the quantity and the planned price.</p>
2	Approval of the procurement plan	<p>Revision of the procurement plan</p> <hr/> <p>Consolidation (by item category, by delivery time)</p> <p>Challenges:</p> <p>Delivery after payment</p> <hr/> <p>Define a purchasing responsibility center</p> <hr/> <p>Assignment to the responsibility Center (Moscow, Berezniki, Kirovo-Chepetsk, etc. In the context of managers</p>	<p>Revision of the procurement plan is accomplished by reviewing and aligning the generated needs of the responsible staff with the customized workflow. When you configure the reconciliation process, you specify the roles of the employees who are involved in the reconciliation process, the actions they perform (negotiation/rejection, delegation, view, and input of additional data). The requirement agreed by all participants of the process is considered approved. The next step is to consolidate the approved requirements by categories and delivery dates. Consolidation is performed automatically according to pre-configured rules (for example, every day outside of business hours) or manually by a responsible employee. In the case of manual consolidation of needs, the selection of a responsible Procurement Service representative for consolidation and the assignment of a job is carried out by cost center. The consolidation owner uses the workspace in the system to find, manage, and view results, Needs consolidation. According to the results of consolidation of bids, the system automatically changes delivery conditions according to the existing contract (price</p>

		assigned to categories)	reduction per item, change of delivery time). And will create a purchase plan (purchase project in terms of Ariba)
		Creating a purchase Plan	
3	Process the plan in the responsibility center	Creating a purchase project using templates	Based on the aggregated requirement, a draft procurement procedure is being formed in ARIBA Using pre-configured templates. The draft procurement procedure includes a list of aggregated Requirements of the procurement plan. When creating a procurement procedure project, the responsible employee determines the purchasing strategy. The system must be able to store a reference to the purchase strategy document in the project Procurement procedure. On the basis of the procurement procedure Project, the procurement procedure is formed according to pre-configured patterns, individual routes with the possibility of using flexible mechanisms to create competitive procedures. At formation of purchase the responsible employee defines necessary parameters of purchase: type of procedure (request of prices, request of quotations, online auction, etc.), terms of its carrying out, stage, formation of a pool of tasks for representatives of the customer involved in conducting procedures and other required parameters. When the procurement procedure is formed, the necessary information is automatically
		Defining a purchasing strategy	
		Formation of purchase (according to the template, individual route using the mechanism of type "constructor of competitive procedures")	
		Creating a task pool by responsible implementers	
		1C status update	
		Dashboard update (Manager's control Panel, in terms of managers,	

		deadlines, strategies)	loaded from the pre-established procurement procedure project.
		Updating the procurement procedure	<p>In 1c the STAT is updated. In the form of procurement.</p> <p>Managers of purchasing procedures in the system are available reports, including up-to-date information on managers' loading, terms and Strategies of procurement procedures.</p> <p>The system should also provide an opportunity to actualize already formed procurement procedures.</p>
4	Initiation of the procurement procedure	Creating a list of vendors in categories	<p>The system generates a list of providers that can be invited to the procedure. After automatic or manual confirmation of this list, at the time of publication of the procedure they are automatically sent an invitation to participate in this procurement procedure.</p> <p>The system should allow for the formation of non-price criteria for supplier selection. This can be implemented in the form of evaluation cards and KPIs by suppliers. Maps are a questionnaire containing questions of the given type and sent to the responsible employees on the given lists. Automatic calculation can be used to evaluate the questionnaire. In this case, the questions in the questionnaire should have a specified score in points. The calculation results are converted to the calculated formulas in the final estimate. Several estimates for a given calculation formula are converted to the supplier's KPI.</p> <p>The system should allow to form price criteria for selection of suppliers. Price criteria are the positions of the procurement plan and can be grouped into</p>
		Formation of non-price criteria of procedure	
		Formation of pricing criteria of the procedure	
		Sending invitations to participate in the procurement procedure	
		Status update in 1C	
Enter a quotation within the vendor's personal cabinet			

			<p>sections and lots of the contents of the procurement procedure.</p> <p>Supplier estimates and KPIs should be available for analysis and use during the procurement procedure.</p> <p>After sending invitations to suppliers (publication of the procurement procedure), the status is updated in 1C.</p> <p>After receiving the invitation, the supplier enters the personal account in the system by the attached link, where he can familiarize with the purchase documentation. Further, through the personal cabinet, the supplier makes a proposal.</p>
5	Agreement on technical and commercial procedure	<p>Elimination of comments found</p> <hr/> <p>Unavailability of price information before opening the letter</p>	<p>After submission of the offer by the supplier there is registration and elimination of found comments.</p> <p>Before opening of envelopes (if it is provided) the submitted price offers should be inaccessible for viewing by the responsible for purchase.</p>
6	Preliminary processing of offers	<p>Preliminary verification of data received from the provider</p> <p>Challenges:</p> <p>Data from tax authority does not match</p> <hr/> <p>Send notifications to a vendor</p>	<p>The purchasing person pre-checks the data received from the provider, sends it through the notification system to the vendor if necessary.</p> <p>Technical expertise is conducted outside the system, the result of examination is entered into the system by the responsible employee. The system must record all the results for a specific proposal.</p> <p>The system should be able to hide data representing Commercial Secret until the moment of autopsy. The data is opened after the results are committed.</p>

		Control access to data that represents Commercial Secret	
		Conducting technical expertise	
		Capturing results within a specific proposal	
		Access to quotation data	
7	Choosing suppliers (vendors)	Excluding vendors that are not eligible	The process step for deciding which provider to choose starts with a status update of 1C.
		Vendor ranking	After that, the suppliers that are not suitable for the requirements (the first stage of the procedure) are screened out. The system automatically ranks the submitted offers and forms a competitive sheet with the evaluation and indication of the best offer.
		Search for alternative offers-distribution of purchases to several suppliers (optional)	Optionally, the system allows Use scripts to find Alternatives Proposed to distribute the purchase to multiple vendors.
		To issue a choice of supplier	The next step in the process is to issue a vendor choice. This step can be performed in a complete way (outside the system the question is raised in the nearest management session, then the decision is
		Protocol negotiation	

		<p>Conduct of a subsidiary procurement procedure</p> <p>Vendor notification</p> <p>Preparation of contractual documents</p> <p>Conclusion of contract with supplier</p> <p>Export results to 1c to automatically generate purchase orders</p>	<p>entered into the system) (the system sends notifications to management members with a request to make a decision. Further management members Take The decision, and the responsible officer conducts the counting of votes and captures the result in the system).</p> <p>The system must allow internal reconciliation to be executed. When you configure the reconciliation process, you specify the roles of the employees who are involved in the reconciliation process, the actions they perform (negotiation/rejection, delegation, review, correction, and input of additional data). The system ensures that all changes made to the template during the negotiation process are stored.</p>
	Online Auctions		<p>In case of necessary, the system should support the online auction. The settings should be: period, type of auction, pitch of the offer, time of submission, term of automatic prolongation, possibility of carrying out of the tender submission.</p>
8	Contracting		<p>The system ensures the transfer of the supplier's selection results to the system, in order to reconcile the draft agreement with the winner. Final steps are updating the status in 1c, export the results in 1c for automatic formation of purchase orders and registration of the contract in 1c</p>
9	Supplier management		<p>Vendor estimates and KPIs must be automatically saved on the vendor card and be available for analysis and</p>

			subsequent use in the procurement procedure.
	Self-registration accreditation of the Supplier		Suppliers are registered in Ariba and are accredited in accordance with the procedures of Megapolis.

Note. S.V. Kostiev, personal communication (2018)

3.3 Challenges of implementation

Based on my research I found mistakes and errors, which were affecting implementation time.

It is a fact that all foreign corporations and entities entering Russian market facing the problem with legislation, because Russia has quite complex laws and poor execution of them. Additionally, well-known fact that Russia has very high corruption index, what is also affecting business there.

In stage 1, starting to import data from 1C EPR software SAP faced a legal issue with the documentation. Ariba has own format of composing contracts and legal documentation, which didn't match with 1C, as data was not clear or even missed. Big difference between moving from already existing procurement software and starting absolutely from scratch. Downloaded results from 1C were not enough for Ariba to fulfill all criteria.

1C is originally Russian firm – build in there, meanwhile SAP Ariba only adopting it.

Mentality versus business. Trade agreements in Russia build in a way, that suppliers will get money first for goods/services and then will execute their part of liability – advanced payment are popular. But in Europe it mostly works opposite – based on trust, so that vendor/supplier deliver their products and then receive money. So, at the end from procurement point of view it gives additional steps to consider while processing orders.

Stage of agreement on commercial procedure had a delay, due to fact that summarized data from tax authorities was not compliant with data provided by Megapolis. Megapolis is not listed company, that's why legal standards are maintained poorly. So, required additional step was needed. Request Russian tax authority to provide purchasing-related data, revenue, paid VAT etc.

Formation of annual reports are not even close to common reporting standards, because SAP Ariba got used to standards such as GAAP and IFRS. Definitely needed revision of key indicators. For this reason, needed to hire E&Y expert in the field. For overall implementation process it added 2 more weeks.

Those exceptional delays are surely solvable, but it will add time of implementation.

Last steps: choosing supplier, contracting and managing suppliers were successfully completed without delays, because these steps were already pre-defined by Megapolis. Integration requirements

3.4 System Information Security Requirements

Information security in the system should be ensured by the following possibilities:

- Availability of means of authentication of users of the system, restrictions on the size and validity of user password;
- Authenticate users by accessing the application server
- Differentiation of user access rights (separately to system functions, user data);
- System event logging with the ability to quickly find events;
- Delete a user record only if there are no objects in the system that are related to that user in any way.

The system must provide user access control through authentication and authorization mechanisms and, if necessary, encryption.

The authorization procedure must be done by entering the login and password specified by the user when registering it. Users must be registered by an administrator. The administrator, registering the user, confirms the entered data and sets the expiration date of the login and password.

For a specific user (person), the system must have only one account.

(S.V. Kostiev, personal communication, 2018)

3.5 System Ergonomics Requirements

User interaction with the software included in the system should be done through a visual graphical interface (GUI). The ARIBA interface should be intuitive and user-friendly, should not be overloaded with graphical elements, and should provide fast display forms.

Navigational elements must be made in a user-friendly form. The means of editing information should satisfy the accepted agreements in the part of use of function keys, modes of operation, search, use of window System.

System input-output, reception of control commands and display of results of their execution should be executed in an interactive mode. The interface must meet modern ergonomic requirements and provide convenient access to the main functions and operations of the system.

The interface should be designed to use a mouse or touch-screen manipulator, that is, the system should be controlled using a set of OSD, buttons, icons, etc. elements. The input keyboard mode should be used mainly when filling and/or editing text and numeric fields of screen forms.

All display form labels, as well as messages issued to the user (except for system messages) must be in Russian.

The system must ensure correct handling of emergency situations caused by incorrect user actions, incorrect format, or invalid input data values. In these cases, the system must provide the user with the appropriate messages and then return to the working state that preceded the incorrect (invalid) command or incorrect data entry.

Screen forms should be designed to meet the requirements of unification:

- All screen forms of the user interface must be executed in a single graphic design, with the same location of the main controls and navigation;
- Similar graphical icons, buttons, and other control elements should be used to denote similar operations. The terms used to denote typical operations (adding an information entity, editing a data field), and the user's sequence of actions when executing them, must be standardized;
- The external behavior of similar interface elements (the reaction to mouse hover, focus switching, Button press) should be implemented equally for the same elements.

The system should ensure that the user interface is displayed correctly when using the following browsers:

- Internet Explorer version 8 or higher;
- Google Chrome version 20 or higher.

(S.V. Kostiev, personal communication, 2018)

- Methodological support of the project

In my opinion, within the framework of the project it is necessary to adapt the procurement regulations of the customer to new processes and functionality of the introduced system. It is necessary to consider the principle of its unity for all enterprises of the group. The situation should consider the features of the system solution created by the project, the composition of system steps, roles and the set of operations registered in the system.

The normative documents developed within the framework of the project should include descriptions of approaches to categorical management of the supply function, define the basic concepts of categorical management, principles of development of categorical strategies and work Categorical commands. (S.V. Kostiev, personal communication, 2018)

3.6 Requirements to the composition and content of works

Table 3.4 Requirements to the composition and content of works

Phase Name	List of performed works	Phase results
Stage 1. Project preparation	Defining the objectives of the project; Formation of the Project Team; Preparation of a detailed work plan; Holding a project launch meeting.	Detailed work plan for the project stage; Presentation for the kick-off meeting; Order on the start of the project phase; An IT platform for starting work has been prepared.
Stage 2. "Design"	Discussion of detailed process requirements; Development and coordination of design solutions; Formation of the registry of additional developments; Approval of the registry of additional developments; Correction of project documents; Approval of documents; Approval of the phase results;	Design solutions; Registry improvements; Register of data loading templates; Migration regulations.
Stage 3. "Implementation"	Filling data patterns for migration; Setup and System Update; Preparation of functional specifications for development; Development; Testing migration tools; Preparation of a test plan; Testing; Processing and coordination of comments; Approval of test results; Preparation and coordination of an IT training plan (key users only); Preparation of the learning environment; Preparation of training materials; Conducting training; Providing data for IT; Preparation of test scripts; Preparation of an IT plan; Preparing an order for IT;	Filled data migration patterns; Functional specifications; Test scenarios; Test boards; Testing protocols; Training plan and IT plan; System for training; Finished study materials; Key users have been trained; training protocols; IT scripts; IT protocols; Registry errors and comments on the results of IT; Requests for change; Customized system; Procurement regulations of the MEGAPOLIS group of companies.

	Eliminate comments on the results of IT.	
Stage 4. "Preparing for running "	Preparation of user instructions; Preparing for end-user training; Conducting user training; Preparation of a productive landscape system; Data migration; Entering dynamic data into the production system; Loading roles and permissions; Download and check permissions for users.	User instructions; Methodological materials and training infrastructure; Learning protocols; Productive system; Migration protocols; Authority matrix; Uploaded users to the system; Order to start
Stage 5. "Running and support"	Preparing end-of-period data for productive migration; Conducting productive migration; Users support; Transfer system in support; Support the project team of the Customer.	Data loading protocol; Incident log; System transfer protocol

Note. S.V. Kostiev, personal communication (2018)

Planned implementation time was six months, but due to described issues, it took 7.5 months. Definitely, it's not a case for all business – sometimes it can be even less than 6 months.

To summarize the research, a lot of factors impacts procedures as trade agreements order, tax authority reporting etc., so that it's very hard to predict such, for SAP Russia is a critical region to enter. But I think it may be prevented before happening even there by selecting criteria:

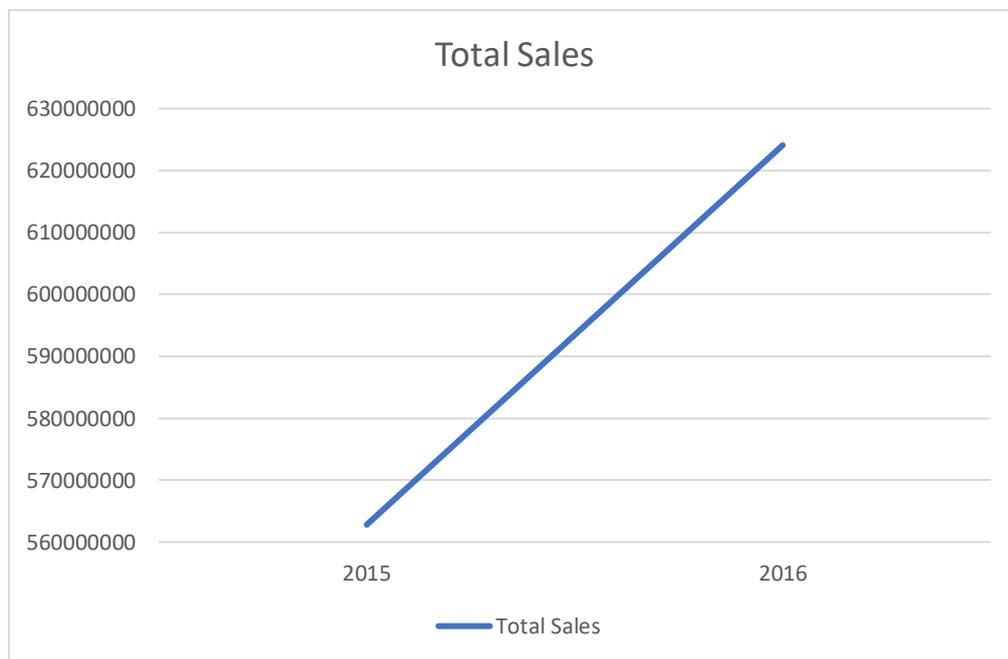
- Regional selection – same country
- Regional legislation – same country
- Regional taxes – same country
- Homogenous customers – same industry
- With more or less same turnover

If all customers would be filtered according to criteria, SAP may create handbooks defining above criteria, in order to avoid delays in completion of implementation.

3.7 Financial results

Due to sensitivity, Ariba software implementation price can't be mentioned. So, I couldn't analyze spent amount and how much it brought to Megapolis, but I used annual reports to compare financial indicators, which are freely available.

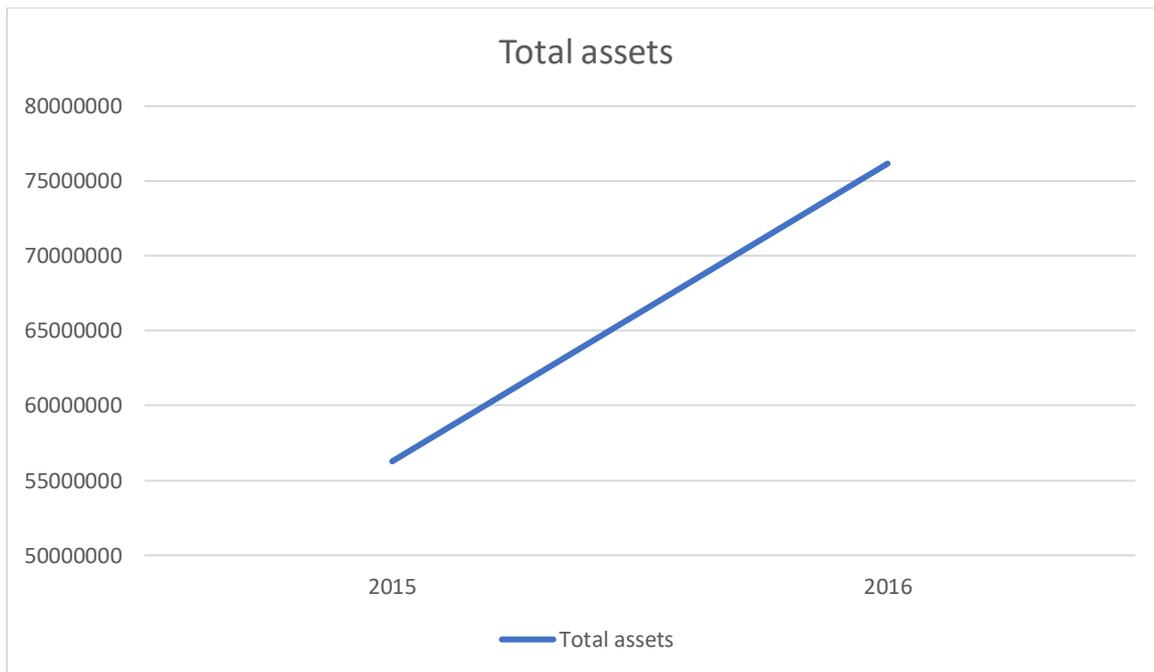
Figure 3.1 Megapolis's Total Sales



Note. Финансовая отчетность АО. (n.d.). Retrieved from https://zachestnyibiznes.ru/company/ul/1045000923967_5003052454_AO-TK-MEGAPOLIS/balance

From the graph above, total sales volume in years 2015 and 2016 increased from 562,78 to 624,1 million RUB.

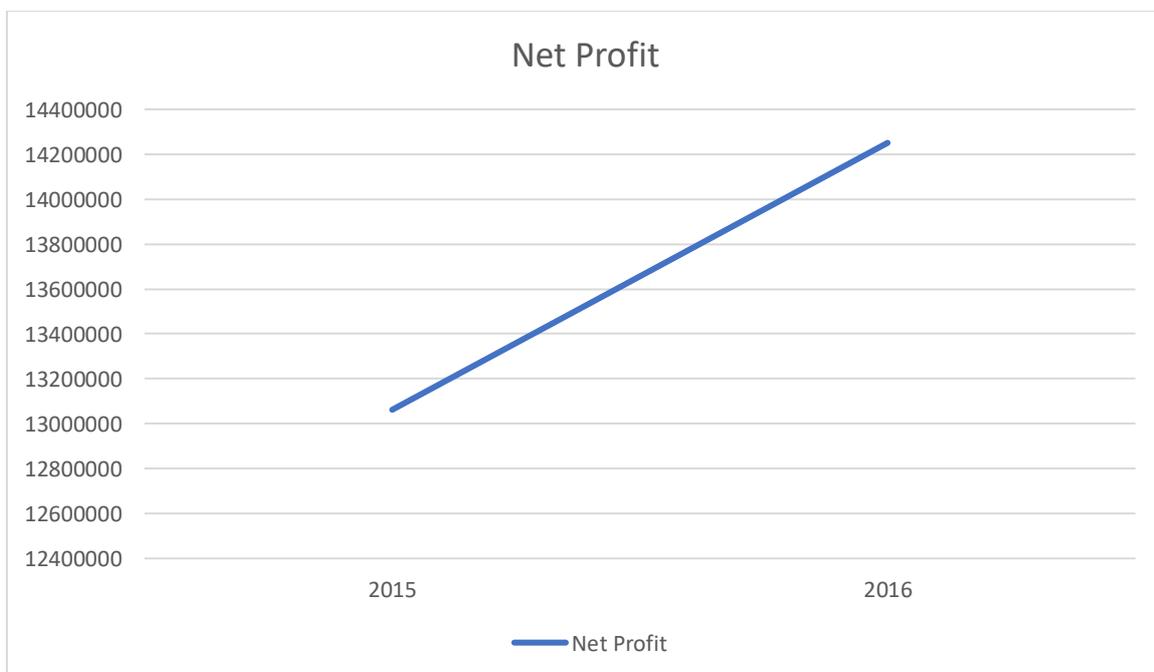
Figure 3.2 Megapolis's Total Assets



Note. Финансовая отчетность АО. (n.d.). Retrieved from https://zachestnyibiznes.ru/company/ul/1045000923967_5003052454_AO-TK-MEGAPOLIS/balance

Total Assets value increased from 56,27 to 76,16 million RUB

Figure 3.3 Megapolis's Net Profit



Note. Финансовая отчетность АО. (n.d.). Retrieved from https://zachestnyibiznes.ru/company/ul/1045000923967_5003052454_AO-TK-MEGAPOLIS/balance

From the graph above, Net Profit in years 2015 and 2016 increased from 13,62 to 14,25 million RUB.

Comparing financial indicators of Megapolis from 2015 to 2016, Ariba software positively affected financial outcomes such as increase in total assets, sales and eventually profit of the company. From financial perspective it was good decision to implement Ariba.

3.8 Final achievements

Answering to stated research question “Does it worth to implement SAP Ariba software? What benefits and what outcomes it might give to a customer?” - implementation is clearly complicated process requiring a lot of human and financial resources. Not every business goes for it, especially when SAP is foreign company for customer, but Megapolis did it and there are final achievements:

- 14,57% - average reduction in e-auctioning costs
- 1031 – number of new suppliers
- 534 – new sourcing projects created
- 337 – new supply agreements established
- 60 – auctions executed

(SAP Ariba. (n.d.). Megalopolis Business Transformation Study)

After implementing Ariba software to win e-auctions became much easier and cheaper. Vendors showed interest in being partners with Megapolis after having new Ariba procurement system.

What are outcomes from organizational side?

From my analysis, I would highlight less time-consumption i.e. moving from manual spreadsheets to organized system.

Second point is better cost efficiency meaning goods are delivered at lower price.

Third point – following policies and procedures in all procurement sectors. In other words, improved compliance control.

Increased stakeholder engagement due to centralized system, more intervention from their side.

And the last point is improved transparency with improved spend and procurement data.

At the end, I can say that implementing Ariba worth it. Although procurement giant has problems with local implementation due to legislation and reporting issues – it's still can be solved, but the deadlines are affected. Delays can be prevented by more detailed plan and more precise selection criteria written in

Since now, Megapolis became orderly centralized company with great potential to place themselves as top companies in Russia.

CONCLUSION

The main goals of this thesis were to analyze procurement modules of SAP, market of ERP software and find the answer for research question about most profitable procurement product: “Is it worth to implement SAP Ariba software for business, specifically to company Megapolis? What are the challenges and what results were achieved?”

In introduction part I have written about ERP in general, its importance and advantages. Different types of modules are discussed, including short information about the establishment, history and its successes. One can find about usage of material management, supply chain management modules, delivery, purchasing processes etc. in this chapter. Delivery types like inbound and outbound are differentiated. I also described SAP’s impact on society – NGOs cooperation and social activities.

In the second chapter ERP of procurement market, trends, competitors are analyzed, and the result is found that SAP is the leader of market and trend of this company is positive. Although SAP has biggest market share on ERP market, Oracle is stepping on SAP’s heels with their innovative products. I tried to compare both products from technical side by researching advantages and disadvantages affecting the business-related topics and from customer side by comparing and interviewing employees of companies, which are using both softwares. At the end, breakaway is not high and both competitors have their own benefits and disadvantages.

Newest and most profitable product in procurement - SAP Ariba software, described in 3rd part. Starting with small introduction of the system I directly moved to stated research question.

By close cooperation with SAP IT specialist, I managed to analyze all implementation steps and its failures. Although the company is famous for its standards and quick implementation, there were challenges such as delay in 1.5 month related to local tax/reporting legislation, which at the end created additional steps – increasing processing time.

While reviewing final achievements and financial results after full implementation process, I came to conclusion that Megapolis became the company with centralized system, compliance control, improved cost efficiency and great potential to expand themselves globally. Significant results are: 14,57% reduction of costs in e-auctions, 1031 – number of new suppliers and 337 new supply agreements. Even though there were challenges with implementation, Ariba achieved great results with regards to Megapolis. Answer to stated research question – it is worth to buy SAP Ariba procurement software.

METHODOLOGY

Theoretical part:

I started my thesis with brief introduction and history of the company using the article from official SAP website (11.).

For describing SAP modules 1.1.1.-1.3.3, mainly used book by Kappauf – Logistic core operations (1.) and supplementary materials from books under these numbers (6,7,8).

How SAP affect the society? Was also taken from internet resources noted in reference list

Practical part:

Moving to very important part of research analysis of ERP procurement system market:

- For assessment of vision and mission used *SAP Purpose & Promise / About SAP SE. (2018)* official SAP website as well as *Annual SAP reports from 2009-2016*
- Data for calculating market trends and shares was taken from *Statistics portal - Statista.*
- Calculation formula was taken from *Simplicable.com*
- Variables for calculation are taken from:
Annual Report. (2009-2016) SAP.com
Annual Report 2016. (2009-2016). Oracle Financial Services Software Limited.
Annual report JDA Software (2009-2016)
Annual report Manhattan Associates (2009-2016)
Annual report Infor Global Solutions (2009-2016)
Annual report Epicor (2009-2016)
Annual report Ariba (2009-2016)
- For the part 2.2 ERP trends to observe, I used the research of Forrester agency, which were freely available.
- Part 2.3, Panorama Consulting research “Clash of clans” – which was concluded from annual reports and product offer provided by SAP, Oracle, Inferior.
- Competitor’s comparison performed using resources from 16-25. Researches, Harvard Business Journal, Annual reports
- SAP ERP challenges is considered using already existing data taken from internet resources
- Employees were interviewed, comparing SAP and Oracle, considered as added value
- Chapter 3. Ariba and SAP SRM to Ariba taken from official Ariba portal cited in reference part. Megapolis implementation process was researched with SAP IT,

primary data was used and analyzed. Results and challenges were researched as added value. Research question was answered as well.

Above numbers referred to Literature resources

LITERATURE

1. Kappauf, J., Lauterbach, B., & Koch, M. (2014). Logistic Core Operations with SAP Procurement, Production and Distribution Logistics. Berlin: Springer Berlin.
2. Bryla, B., & Loney, K. (2014). Oracle database 12c: The complete reference. New York: McGraw-Hill Education
3. SAP Purpose & Promise | About SAP SE. (2018). Retrieved from <https://www.sap.com/corporate/en/vision-purpose.html>.
4. HCL Partners with SAP to Develop Enhanced Customer Self-Service Options for Utilities. (2015). Entertainment Close-up.
5. Learning Journey 2.0. (2018) SAP Help Portal book. Retrieved from https://help.sap.com/doc/221f8f84afef43d29ad37ef2af0c4adf/HP_2.0/en-US/c29ef7db6a7d4e35a461ace6ba447d7c.html
6. BENNETT, CRAIG. (2017). SAP as an Option for Customer Development.
7. Linnéa Ahlskog, Matilda Edler, Camilla Holmgren. (2013). How an ERP System Affects Order Processing in a Purchase Department. ss. 11,12.
8. Nieslanik, R. (2016). Optimization of Order and Purchase Process in SAP and Integration with print system.
9. Panorama Consulting Solutions, L. (2017). CLASH OF THE TITANS 2017. Panorama Consulting Solutions, LLC.
10. REUTERS. (2016). SAP Plans to Invest \$2.2 Billion in the Internet of Things by 2020.
11. SAP. (2017). History of SAP. Retrived from <https://www.sap.com/corporate/en/company/history.html>
12. SAP, Kara Glencross, Dan Wellers. (2016). Innovation at SAP. SAP.
13. Tasevska, M. (2017). Top 10 Procurement Software Vendors and Market Forecast 2016-2021. SAP procurement analysis. Retrived from <https://www.appsrntheworld.com/top-10-procurement-software-vendors-and-market-forecast/>
14. Forrester is a highly influential global research and advisory company. (2017). Retrieved from <https://www.forrester.com/Enterprise-Resource-Planning-Applications-%28ERP%29>.²
15. "Bit on Gartner's Magic Quadrants and 2007 report for ERP Vendors" OracleApps Epicenter. (2008). Retrieved from <http://www.oracleappshub.com/misc/bit-on-gartners-magic-quadrants-and-2007-report-for-erp-vendors/> .

16. "Compare ERP System/ERP Software Solutions." Technology Evaluation Centers. (12 Nov. 2008). Retrieved from <http://erp.technologyevaluation.com/> .
17. Farber, Dan. (2015) "Disruptions in the software fabric." Builder AU - By developers for developers. Retrieved from http://www.builderau.com.au/strategy/businessmanagement/soa/Disruptions-in-the-software-fabric/0,339028271,339158080,00.htm?feed=pt_sap .
18. "Gartner Consulting Web Site." Gartner Consulting. (20 Nov. 2008). Retrieved from <http://www.gartner.com/>.
19. Greenbaum, Joshua. (2016) "SAP beats Oracle? Oracle surrounding SAP? Microsoft raking in new customers?" Retrieved from <http://blogs.zdnet.com/Greenbaum/?p=125>.
20. Haggis, Andrei, Pay-Ling Yin, Daniela Beiersdorf, and Vincent Dasani. (2006) "SAP: Industry Transformation." Harvard Business Journal N/A 28p.
21. "Human Capital Management Solutions." Oracle, The World's Largest Enterprise Software Company. (2016) Retrieved from <http://www.oracle.com/applications/human-capital-management.html>.
22. Jutras, Cindy. (2014) "The Total Cost of ERP Ownership." Aberdeen Group. Retrieved from http://www.aberdeen.com/summary/report/enterprise_strategies/ES_ERP%20TOC_CJ_3572.asp.
23. Jutras, Cindy. (2015) "Aberdeen Group: The Cost of ERP Functionality." Aberdeen Group. 12 July 2007. 10 Nov. 2008 Retrieved from http://www.aberdeen.com/summary/report/research_briefs/4353-RB-cost-erp-functionality.asp.
24. Jutras, Cindy. (2007) "The Total Cost of ERP Ownership in Mid-Size Companies." Aberdeen Group. Retrieved from http://www.aberdeen.com/summary/report/sector_insights/4362-SI-erp-cost-mid.asp.
25. "Magic Quadrant for ERP Service Providers, North America, 2007." Gartner Custom Newsletter Programs. (2008) Retrieved from <http://mediaproducts.gartner.com/reprints/cgi/150514.html>
26. Global ERP software market 2015-2021 | Statistic. (2018). Retrieved from <https://www.statista.com/statistics/605888/worldwide-enterprise-resource-planning-market-forecast/>
27. SAP Ariba. (n.d.). Megalopolis Business Transformation Study. Retrieved from <https://www.ariba.com/resources/library/library-pages/megalopolis-business-transformation-study>
28. Ariba, S. (n.d.). Transform SRM. Retrieved from <https://www.ariba.com/programs/transform-srm>
29. Nickolas, S. (2018, March 06). How do I determine a company's market share? Retrieved from <https://www.investopedia.com/ask/answers/033015/how-do-i-determine-particular-companys-market-share.asp>

Annual Reports

- Annual Report (2009-2016) SAP.com
- Annual Report (2009-2016). Oracle Financial Services Software Limited.
<https://www.oracle.com>
- Annual report JDA Software (2009-2016) <https://jda.com/>
- Annual report Manhattan Associates (2009-2016) <https://www.manh.com/>
- Annual report Infor Global Solutions (2009-2016) <https://www.infor.com/>
- Annual report Epicor (2009-2016) <https://www.epicor.com>
- Annual report Ariba (2009-2016) <https://www.ariba.com>

LIST OF FIGURES AND TABLES

Figure 1.1 SAP Material Management Modules (SAP MM Tutorial - SAP Material Management Training Tutorials. (n.d.). Retrieved April 02, 2018, from <https://www.tutorialkart.com/sap-mm/sap-mm-material-management-training-tutorial/>)

Figure 1.2 Organization units in a Warehouse system. SAP MM Tutorial - SAP Material Management Training Tutorials. (n.d.). Retrieved April 02, 2018, from <https://www.tutorialkart.com/sap-mm/sap-mm-material-management-training-tutorial/>

Figure 1.3 Optimized Purchasing SAP SCM APO SNC IBP. (n.d.). Retrieved April 02, 2018, from <http://scmgmt.blogspot.com/2009/01/purchasing.html>

Figure 2.1 Market shares of procurement application of companies (Tasevska, M., Pang, A., & Markovski, M. (2018, January 24). Top 10 Procurement Software Vendors and Market Forecast 2016-2021. Retrieved March 19, 2018, from <https://www.appsruntheworld.com/top-10-procurement-software-vendors-and-market-forecast/>)

Figure 3.1 Business process (2018). Personal communication with S.V. Kostiev

Table 2.1 Market shares of procurement software vendors from 2009-2016(SCM and procurement software market share 2009-2016, by vendor | Statistic. Retrieved April 02, 2018, from <https://www.statista.com/statistics/268927/global-market-share-of-supply-chain-management-software-vendors/>)

Figure 2.2 Trend lines of top three procurement software vendors in markets (Diagrams according to table 2.1)

Figure 2.3 According to “The Statistics Portal-Statista” Global market share held by supply chain management (SCM) and procurement software vendors from 2009 to 2016 (Diagrams according to table 2.1)

Table 2.2 Forecasting of market share of SAP in procurement for 2018 by applying moving average method. Data of only SAP are taken from table 2.1 (my own calculation by application of method)

Table 3.1,3.2 1. SAP Ariba. (n.d.). Megalopolis Business Transformation Study. Retrieved from <https://www.ariba.com/resources/library/library-pages/megalopolis-business-transformation-study>

Table 3.3, 3.4, 3.5 S.V. Kostiev, personal communication, November 1, 2018, my own analysis

Figure 3.1,3.2,3.3 Финансовая отчетность АО. (n.d.). Retrieved from https://zachestnyibiznes.ru/company/ul/1045000923967_5003052454_AO-TK-MEGAPOLIS/balance