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Understanding the importance of purchasing operations and identification of opportunities to increase their sustainability through process mapping[6]

Abstract

The modern concept of doing business requires every company that wants to be successful to have connected and integrated operations with other companies. The concept of the supply chain enables efficient integration of all included members to fulfil customer demand. An essential element in overcoming business challenges is purchasing, the primary purpose of which is to provide the company with the optimal quantities of goods necessary for smooth and effective functioning. The fundamental goal of the present paper is to draw attention to the importance of effective purchasing operations – with an emphasis on the spare parts business – through mapping business processes. Doing so, it would become apparent to the management of firms how to enhance information flow, and improve process visibility, hence getting a better understanding of the need to improve the efficiency and sustainability of purchasing processes.

Keywords: purchasing, sustainability, process mapping, spare parts

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Introduction

The importance of cost-, and sustainable-effective process and flow management in modern supply chain management cannot be stressed enough. The profitability and competitiveness of companies in all industries are judged by how well they manage to provide their customers, who have increasing demands, with products (Vuorinen 2013). Therefore, as the cited author concluded, the challenge for each company is to provide a product at a sustainable price while also following up with a competitive purchasing and delivery service organisation. An essential element in overcoming this challenge in the company, or group of companies that make up a supply chain, is purchasing, the primary purpose of which is to provide the company with the optimal quantities of goods necessary for smooth and effective functioning. Purchasing has changed through the years, as well as logistics generally, by moving from administrative to more strategic and logistics functions. The vital importance of purchasing has received increasing attention over the years, and it has been argued that purchasing must ultimately become part of supply management (Asikainen 2013). The level of purchasing development also has an impact on after-sales business (Asikainen 2013; Wagner et al. 2012), which represents a relevant source of profit and competitive advantage. By focusing on the after-sales services (including maintenance and spare parts sales), as a means to achieve customer satisfaction and retention, companies can gain a strategic advantage.

Efficiently managing the purchasing process is difficult, especially in the field of spare parts. For example, there is the obligation for delivering spare parts even after the actual production of the primary products has ended; demand planning is problematic because it is difficult to forecast; service requirements are higher as the stocks have a much more significant effect (Asikainen 2013). Also, customers are very time-sensitive, and their purchasing behaviour is increasingly demanding towards lead times (Romppanen 2014). In many situations, problems have emerged as the information and process flow are not visible enough. The process of purchasing management has become even harder in the last decades with a significant shift towards greener practices. Many companies strove to improve their environmental performances, and green purchasing has been a logical extension of this effort. Sustainable purchasing activities often rely on established product standards, labels and certification that declare the environmental attributes or performance of the products or services (Lacroix et al. 2010). The requirements for greener and sustainable business practices put additional pressure on purchasing activities in the supply chain.

The fundamental goal of the present paper is to draw attention to the importance of effective purchasing operations – with an emphasis on the spare parts business – through mapping business processes. Doing so, it would become apparent to the management of firms how to enhance information flow, and improve process visibility, hence getting a better understanding of the need to improve the efficiency and sustainability of purchasing processes. Therefore, the main objective of this paper is to illustrate the importance of increasing visibility of purchasing operations by demonstrating with the help of a case study how process mapping could be used to reach the stated objective. The created process maps and the conclusions of this paper could support the decision-making process in the company of our case study.

Basic theoretical framework

Supply chain management and the principle of sustainability

All actors involved, directly or indirectly, in fulfilling customers' needs are parts of a supply chain (Chopra–Meindl 2012). The number of linked organisations and different operations within the supply chain involve many opportunities to gain various kinds of benefits (Maslaric et al. 2013). The most common actors are raw material producers, manufacturers, warehouses, retailers, third-party logistics suppliers, and the end customers. The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer (Lummus–Vokurka 1999). Such a group of actors strives to act based on well-coordinated and integrated organisations with the final goal of being more efficient than the competitive supply chains. The function of the supply chain is to support the organisation in achieving its business goals (Vuorinen 2013). Four basic processes – purchasing, production, delivery, and planning – broadly define the functions, which include managing supply and demand, purchasing raw materials and parts, manufacturing and assembly, warehousing, order management, and delivery to the final customer. Supply chain management coordinates and integrates all of these activities into a seamless process (Lummus–Vokurka 1999).

Sustainable development, generally speaking, has to meet the needs of the present generation without claiming to have the ability to meet the needs of future generations (Schonewille 2016; Todorovic et al. 2018). It can involve many factors: a new way of energy consumption, a better understanding of climate change, and increased transparency of environmental and social actions of the organisation (Wateau–Cam-

pos 2015). Sustainable development is based on three dimensions: economic, social and environmental, which means that business success is no longer defined only by monetary gain but also by the impact that the activities of businesses have on society and the environment (Wateau–Campos 2015). Sustainable logistics is a process for the planning and implementation of sustainability as a part of business activities that involve purchasing and production processes, as well as transport operations. Hence, the main challenge in supply chains is to organise logistics activities as efficiently as possible, while considering requirements from both the supply and the demand side, with regards to sustainability as well.

Purchasing management

Purchasing is one of the essential logistics functions, or as Bowen (2018) put it, one of the three key functional areas that make the supply chain up. Purchasing is responsible for supplying the organisation with all the necessary raw materials, semi-finished products, and materials. Purchasing provides a mechanism to initiate and control the flow of materials through the supply chain. Purchasing is a term that is very commonly used interchangeably with the terms procurement and sourcing. However, Asikainen (2013) made a distinction among them in a way that is justified and logical. Procurement refers to operational purchasing activities, such as releasing purchase orders, monitoring supplier performance and managing the daily order fulfilment process in general. Sourcing, which is more strategically oriented than operative procurement, refers to the broadened scope of supply management, and it includes areas such as the formation of supplier structures and development of supplier capabilities, among others. Purchasing is a general term used to cover both sourcing and procurement (Asikainen 2013). Purchasing consists of a number of connected activities that help the organisation to source materials from different suppliers. On a broad level, purchasing includes five subcategories:

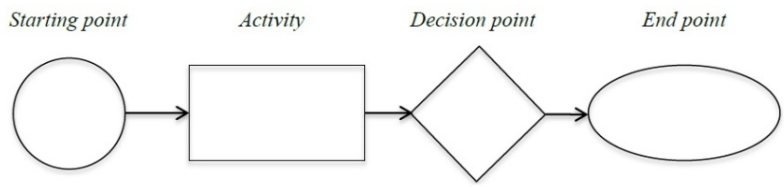
- Supplier relationship management
- Supplier contracts
- Processes, systems, and sourcing approach
- Data analytics
- Organisation and people (Bowen 2018).

In most situations, purchasing is not in charge of the physical movement of materials, but rather it provides information and to covers all organisational issues. Therefore, purchasing is much more about information processing than the physical movement of the goods. Purchasing collects data from different sources which, following analysis, are transferred to the whole supply chain. This is why enhancing the information flow and improving process visibility is so important if a company wants to approach the issue of improving efficiency and sustainability of the purchasing processes.

Process mapping

The tool that can be used when a company is altering its way of working towards enhanced information flow and increased process visibility, which could lead to improved efficiency, lower level of inventory, and increased sustainability, is process mapping. Process mapping is a visualisation of all the processes and steps that products are taking (Larsson–Sjostrand 2015). It is created with basic symbols shown in Figure 1. It can be used in different areas in a company or supply chain, from developing a new product to revising information flow, which is the case in this paper.

Figure 1: *Basic symbols used to map a process*



Adapted from Larsson–Sjostrand (2015)

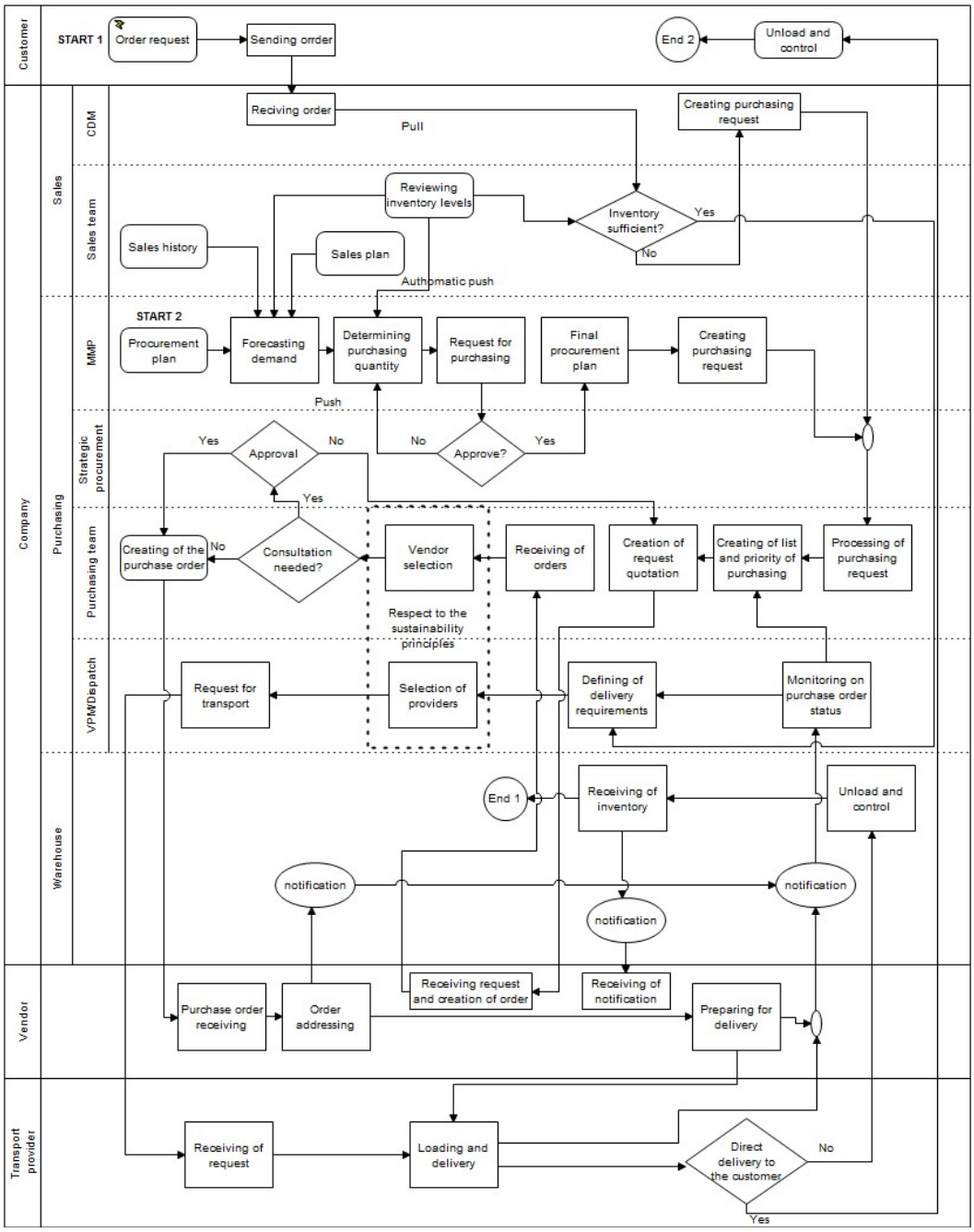
There are different types of visual mapping techniques that can be used when mapping processes, such as value stream mapping, block diagrams, standard flowchart, functional flowchart, swimline diagrams. Each of these methods is suitable for different situations. The process map is usually first drawn on a paper, and then a digital process map can be created using graphic applications and programs (Frankin–Johannesson 2013). When the map is drawn, it should be reviewed, validated, and approved as a single and shared understanding of the process by all actors included in the process.

Case study

Knowledge about the flows (both information and physical), is critical if a company is striving for improvement. We wish to demonstrate the above statement in this part of the paper through a case study. The company in our case study (hereafter "Company"), is a global company in MRO business (maintenance, repair, and overhaul). The company has more than 50.000 different spare part units offered for their clients. For most of these units, the company also provides maintenance and repair services. The primary purpose of the purchasing department within the company is to provide the optimal quantities of goods necessary for satisfying the demand of their customers. The purchasing department is positioned between the sales department and the central warehouses, with which it participates jointly in the realisation of customer demands.

When a sold equipment needs repairs or maintenance, the customer contacts the company for spare parts. Some stocks of spare parts are kept at the company so that they can be delivered in a push manner. On the other hand, for providing spare parts which are not held in stock, the company uses the pull operational model in satisfying customers' requests (see *Figure 2*). Functioning on a push basis relies on an assessment and forecasting of customer needs, based on which a sourcing plan of the necessary spare parts is drawn up. In our company, this is the responsibility of the MMP (material master planners) sector within the purchasing department, which based on the sales history, analysis and planning of the spare part sales (obtained from the sales department), makes a particular forecast and procurement plan for a given period. For some spare parts, a system with an automatic reorder point is applied. It means that whenever the amount of a particular spare part is less than the predefined reorder point in the stock-keeping register, an automatically generated purchase order request is placed (automatic push). After determining the purchased quantity the MMP puts in a request for purchasing, which is reviewed by the strategic purchasing sector (in charge of strategic sourcing issues), and if accepted, it's transferred via the SAP system to the Procurement team (in charge of operative procurement issue), as a final purchasing plan. After examining the purchasing plan, the procurement team places an order to the suppliers (vendors). However, ordering based on a direct customer request (pull process) is also very frequent, which is processed by the customer demand management (CDM) sector first, but then the purchasing process is continued according to the described procedure.

Figure 2: *Process map of purchasing processes in the company studied*



Whether the purchasing request arrives at the procurement team as a result of a pull or push process, it is examined and checked there, as it has been already mentioned, and a request for quotation is formed accordingly. A request for quotation is placed to the suppliers, who will send an order confirmation, including the sales condition, upon receipt of the quotation. Selecting a supplier is the first of two aspects in which a company adopts sustainability criteria when making a final decision (see *Figure 2*). The strategic purchasing sector is also consulted when the supplier is selected. A shortlist of the offers of the best three suppliers is submitted to the purchasing supervisor, who makes the final decision. Then a purchase order is initiated and sent to the selected supplier.

The activities of the procurement team shall end after receiving confirmation from the supplier concerning the purchase order, including their agreement to all order conditions. The VMP (vendor performance management) team is in charge of the order from here on. They communicate with the supplier regarding the delivery and its status. The VPM is also responsible for selecting the appropriate logistic service provider (LSP) to perform the delivery service. This is the second aspect of the purchasing process, where the company considers sustainability criteria during the decision-making process. LSP handles transportation from the supplier to the company. The delivery of spare parts to the company is followed by their control and testing, then they are entered into the company's inventory system (warehouse), from where they are delivered to the customer. Delivery can also be made directly to the customer's address.

The management could use such process maps to increase information flow and process visibility, with the final goal of assisting decision making. The company could also use the process maps for identification of customer value so that they can eliminate activities that are non-value-adding (creating a value stream map). Furthermore, process maps could serve as a base for process modelling as an abstraction of a business that shows how business components are related to each other, how they operate, and how they could be redesigned for better functioning.

Conclusion

In today's global market, companies have to work on improving their business daily to keep their customers. To succeed, they have to live up to customer expectations on delivering goods at the right time, to the right place and so on. Companies have to do this, or they will lose out on their competitiveness. An essential element of overcoming this

challenge the company or supply chain is facing is purchasing. Efficiently managing the purchasing process is difficult, especially in the field of spare parts. In many situations, the leading cause of purchasing process inefficiency is the low level of visibility of information and process flow. The process of purchasing management has become even harder in the last decades with a significant shift towards greener practices. The main goal of this paper was to promote a deep understanding of the importance of effective purchasing operations through process mapping so that the management can see the steps enhancing information flow and improving process visibility. By observing the purchasing process of the Company and creating the related process map displaying the purchasing process and all corresponding activities, we accomplished the above goal. Process maps could act as supporting tools in the decision-making process of the Company.

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