UDC 656.225

CRITICAL EXAMINING OF SUPPLY CHAIN SYSTEM IN FOREIGN COMPANIES

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Abstract

Paper considers the supply chains of two unrelated grocery and non-grocery products. Toyota Camry was chosen as a representative of non-grocery product and pizza from Pizza Hut was chosen as a representative of grocery product, because both companies are well-known and successful manufacturers, which may show as good experience of supply chain management. The goal of this paper is to compare and analyze the supply chains of Toyota Camry and Pizza Hut`s pizza. Authors found it interesting to compare products from different areas such a fast food and high-tech industry. Because complexity of industry may affect to supply chains` structure, to its participants and other aspects of functionality of entire supply chain. Findings show that Toyota Camry`s supply chain structure are more complicated, and was built in trustful relations among manufacturer, supplier, dealer and customer. Pizza from Pizza hut uses JIT concept and modern communication technologies that provide cost minimization and faster working process. Research findings show that both products are made from qualitative raw materials in accordance with quality standards, and manufacturers focus on high quality. Moreover, products from different area require different approaches in establishing supply chain.

Keywords: logistics, logistics systems, supply chain, suppliers, structure of supply chain, dealers and client base, Toyota Camry, Pizza Hut, Toyota Production system, JIT.

ШЕТЕЛ КОМПАНИЯЛАРЫНДАҒЫ ЖЕТКІЗУ ТІЗБЕГІ ЖҮЙЕСІН КРИТИКАЛЫҚ ТАЛДАУ

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Аннотация

Мақалада азық-түлік және азық-түлікке жатпайтын тауарларды өндіретін екі шетелдік компанияның жеткізу тізбегінің моделі талқыланды. «Toyota Camry» азық-түлікке жатпайтын тауар өндірушінің өкілі болып тағайындалса, ал «Pizza Hut» азық-түлік өндірісінің өкілі ретінде таңдалды. Өйткені екі компания да өз салаларында танымал және табысты болып табылады. Бұл жеткізу тізбегін басқарудағы жақсы тәжірибені көрсете алады. Осы мақаланың мақсаты «Toyota Camry» және «Pizza Hut» жеткізу тізбектерін салыстыру және талдау болып табылады. Авторлар азық-түлік өндірісі және жоғары технологиялық индустрия сияқты түрлі салалардағы өнімдерді салыстыруды өзекті деп тапты. Өнеркәсіптің күрделілігі жеткізу тізбегінің құрылымына, оның қатысушылары мен бүкіл жеткізілім тізбегінің функционалдық аспектілеріне әсер етуі мүмкін. Нәтижесінде «Toyota Camry» жеткізу тізбегінің құрылымы күрделі екенін және өндіруші, жеткізуші, дилер және тапсырыс беруші арасындағы сенімді қарым-қатынасқа негізделгенін көрсетеді. Өз кезегінде, «Pizza Hut» JIT тұжырымдамасын және шығындарды барынша азайтатын, жұмыс үрдісін жеделдететін заманауи коммуникациялық технологияларды қолданады. Зерттеу нәтижелері екі өнімнің сапа стандарттарына сәйкес жасалғанын және өндірушілердің концепциясы жоғары сапаға бағытталғанын көрсетеді. Сонымен қатар, түрлі салалардағы өнімдер жеткізу тізбегін құрудың әртүрлі тәсілдерін қажет ететінін дәлелдейді.

Түйінді сөздер: логистика, логистикалық сызбалар, жеткізу тізбегі, жабдықтаушылар, жеткізу тізбегінің құрылымы, диллерлер мен клиенттік база, Toyota Camry, Pizza Hut, Toyota Production жүйесі, JIT,

КРИТИЧЕСКАЯ ОЦЕНКА СИСТЕМЫ ЦЕПИ ПОСТАВОК В ИНОСТРАННЫХ КОМПАНИЯХ

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Аннотация

В статье рассматриваются модель цепочки поставок двух несвязанных между собой зарубежных компаний, которые являются производителями продуктовых и непродуктовых товаров. Toyota Camry была выбрана в качестве представителя непродуктового производителя, а Pizza Hut была выбрана в качестве представителя продуктового производителя, потому что обе компании являются известными и успешными компаниями в своей области, которые могут показать хороший опыт управления цепочками поставок. Целью данной работы является сравнение и анализ цепочек поставок Toyota Camry и Pizza Hut. Авторам было интересно сравнить продукты из разных областей, таких как фаст-фуд и индустрия высоких технологий. Потому что сложность отрасли может влиять на структуру цепочек поставок, на ее участников и другие аспекты функциональности всей цепочки поставок. Результаты показывают, что структура цепочки поставок Toyota Camry является более сложной и построена на доверительных отношениях между производителем, поставщиком, дилером и клиентом. В свою очередь, Pizza Hut использует концепцию JIT и

современные коммуникационные технологии, которые обеспечивают минимизацию затрат и ускорение рабочего процесса. Результаты исследований показывают, что оба продукта изготовлены в соответствии со стандартами качества, и производители ориентируются на высокое качество. Кроме того, продукты из разных областей требуют разных подходов в создании цепочки поставок.

Ключевые слова: логистика, логистические схемы, цепочка поставок, поставщики, структура цепей поставок, диллеры и клиентская база, Toyota Camry, Pizza Hut, система Toyota Production, JIT,

Introduction. Market conditions rapidly change and companies have to be ready to quick respond for saving their customers. Manufacturers are looking for new ways of surviving in high competition of products. They may achieve this by perfect supply chain. Optimal Supply Chain – is another key lever to attain Competitive advantage and any sub optimal usage of Supply chain management can be so much devastating to the industry as well as the economy (ASCh, 2018). As per its fundamental nature, the supply chain is formed as an outcome of series of relationships among multiple firms (Cooper, 1999). In a business context, supply chains are generally described as consisting of companies that produce and supply materials, parts, and those that transform them into products (Choi and Hong, 2002).

The performance of a supply chain depends largely on efficient coordination of the activities of the chain members or partners (Lee et al., 1997; Schneeweiss et al., 2004). Good organized supply chain management may decrease expenses. Moreover, a good supply chain relationship has a positive impact on product quality improvement and cost reduction (Fynes, 2005).

The purpose of supply chain management is to efficiently connect the parties in a value chain in order to minimize costs, enhance customer service capabilities, augment the organization's knowledge base, maximize efficiency, and develop barriers to competitors (Vishal Gupta and Naseem Abid, 2017).

This report aimed to compare two products` supply chain structure and detailed analysis of each stages of supply chain. Supply chains may be defined as including all stages involved in producing and delivering a final product or consumer good from the supplier's supplier to the customer's customer, including managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, and warehousing and inventory (Pics, 2016; Seuring and Müller, 2008).

Pizza hut and Toyota Camry was chosen as representatives of grocery and non-grocery products, thus farther part of report is dedicated to literature review related to these products.

Literature review. *Toyota Camry.* People all over the world know Toyota, which was founded in 1937 in the automobile industry (Toyota, Company profile (2016). Nowadays Toyota Motor corporation is one of the main automotive manufacturers, present in over than 160 countries (Lídia Simão and Ana Lisboa, 2017). The net profit of the Japanese automaker Toyota Motor Corporation for the first half of the 2017-2018 fiscal year amounted to 9.4 billion dollars, which is 13.2% higher than the figure for the same period a year earlier, the company said in an official report (Rambler, 2017). Toyota Camry the model produced in factories in Japan, USA, Australia, Russia and China from 1982 (Wikipedia, 2018). The supply chain which was developed by Toyota was one of the premier in Low Cost supply chains (Essays UK, 2018). Supply-chain management of Toyota Camry is thoroughly based on the Toyota Production System (Dudovskiy, 2012).

Supply chain management of Toyota Camry focused on achieving high quality and cost/waste minimization.

Pizza Hut. Eating fast food makes it harder to maintain a healthy diet (Moore et al., 2009), but people from all over the world continue to consume it. Among high consumers, the most commonly cited reasons for eating fast food are convenience and taste (Rydell et al., 2008). One of such convenient and tasty foods is Pizza. Pizza Hut, a subsidiary of "Yum!", is the world largest pizza company with $12 billion in global sales and restaurants in 93 countries worldwide which serves 70000 people every day (Pizza hut company profile, 2018). Pizza Hut has 16,796 restaurants

worldwide as of March 2018, making it the world's largest pizza chain in terms of locations (Tricon global restaurants, 2018).

Pizza hut`s secret of success is reliable supply chain which focuses on quick customer satisfaction and cost minimization. It`s structure depicted in figure 1:
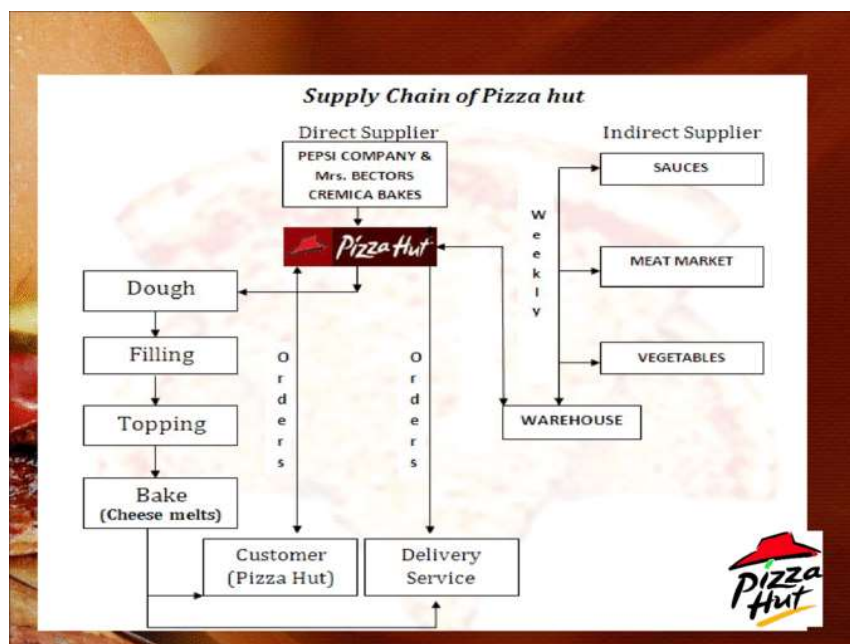

Figure 1. Pizza Hut`s supply chain*
*Source: (https: // vdocuments. net / supply-chain-comparison-mcdonalds-dominos-pizza-hut-india. html)

Supply chain of pizza includes such components as procurement of raw materials, production, warehousing, distribution and delivering a final product to customer through transportation. Farther report focuses on stages of supply chain in both companies and compares the structure and performance of supply chain components by two chosen products.

Materials and methods. Information base of the research consists scientific papers from Sciencedirect, EBSCO, Springer databases. Because they are largest reference and quoted databases of peer-reviewed literature: scientific journals, books and conference materials. The study was conducted at the international level on the basis of foreign practice of supply chain, therefore collected data gathered from foreign sources. Thus, authors consider list of papers from Sciencedirect database related to supply chain concept, proceedings from Springer database, papers from EBSCO database and dissertation works on the topic of supply chain management.

The methodological basis of the study are general scientific methods like classification and comparative analysis. Authors compare two different models of supply chain from different areas of business and critically examine them. Authors use classification as a tool of combining various objects into groups based on common features. They identify common features of both models through classifying their components by different levels.

On the other hand, authors use an analogy that help to prepare conclusion about the similarity of two models in a sign based on their similarity in other signs. Because they found many similarities among supply chain structure of grocery and non-grocery products.

The next method of scientific research used by authors is comparison. They decide that for a comparison to be fruitful, it must satisfy two basic requirements. First claims such phenomena should be compared between subjects or objects where a certain objective community can exist. For cognition of objects, their comparison should be carried out according to the most important, essential (in terms of a specific cognitive task) features. Therefore, authors was concentrated on basic features of both models, that may represent significant distinction among chosen countries.

As the result authors compare procurement, production and storage, distribution and transportation stages in two chosen companies.

In the continuation of the methods of supply chain research that we describe, it is necessary to take into account that theoretically there are two types of supply chain representation: 1) objective and 2) process. Considering that such a division is conditional and serves mainly for methodological purposes, practically the supply chain can be described by using models (Toluyev Yu.I., 2008).

In the general case, the supply chains considered by us in this paper can be represented as a directed graph -G (K, D), where K = {$k_{\mu j}$} is the set of competence units μ of the enterprise performing the j-th operation (in terms of graph theory are vertices); D = {$d_{\mu j}$} is the set of technological connections between competence units (in terms of graph theory, they represent a set of arcs uniting the vertices of the graph). The supply chain consists of a set of B = {B_μ, $\mu \in M$} - manufacturers, suppliers of raw materials and materials, storage terminals, freight forwarding companies and many operations E = {EJ, $j \in L$}. The correlation of the elements of the sets: B = {B_μ} and E = {EJ} defines the competence of $k_{\mu j}$. Each competence is characterized by such properties as the available production capacity $x_{\mu j}$ (t) at each of the time intervals t, the cost of performing the work $c_{\mu j}$, reliability $q_{\mu j}$. The supply function of the enterprise B_μ according to the competence $k_{\mu j}$ will be formulated as $B_\mu = f (x_{\mu j} (t), c_{\mu j}, q_{\mu j})$.

In the supply chains considered in the study, only local criteria for optimization of purchases were optimized, for example, with a pizza. The proposed method of modeling in the context of graph theory with the definition of competence units is necessary, but not sufficient for a comprehensive study of supply chains, because it does not take into account the action of an active person who has his own goals, interests, and individually perceives danger and risk. Since the elements of the graph are active, they act purposefully, autonomously and communicate with other active elements. It is advisable to introduce into consideration the description of the elements of the graph in terms of the theory of organizational management (the theory of active systems) with the construction of open management mechanisms that will naturally increase trust between agents in supply chains (Burkov V., Goubko M., Korgin N., Novikov D., 2015).

If we take into account the reputation of the supplier, the level of trust of the supplier, the reliability of the supplier, then we propose to introduce the function $\varphi\_\mu j = f (W\_\mu j, V\_j)$, where $W_{\mu j}$ is the supplier's knowledge of competence $k_{\mu j}$, V_j is the importance of the operation E_j. Then the function, the offers of the supplier B_μ according to the competence of $k_{\mu j}$, will be formulated as $B_\mu = f (x_{\mu j} (t), c_{\mu j}, q_{\mu j}, \varphi\_\mu j)$.

Results and discussion. *Procurement.* Toyota has a supplier partnership hierarchy in which it develops or builds relations with its suppliers. This is called as supplier partnership hierarchy (Essay UK, 2018). Suppliers of Toyota Camry organized into functional tiers. Suppliers from first tier worked in the direction of product development team, suppliers from the second tier prepare individual parts. First tier suppliers are highly cooperative and there is a relatively strong data exchange between them. Thus, this fact reduces the time costs in new product preparation. Toyota does not a partner with its suppliers just functionally but in operation terms as well, moreover, suppliers are integral elements of Toyota and they are geographically located within 56 miles radius (Essay UK, 2018). I think it is good feature of this company. It helps to build reliable relations with supplier, and close location support cost reduction. Toyota Camry is made of qualitative raw materials, because company`s procurement based on reliability and high-quality. These conditions require a high quality of all raw materials. Communication skills of Japanese professionals help them to establish good relations with all participants of entire supply chain.

What about pizza, pizza`s 95 % of ingredients from local suppliers. They try to minimize their costs through choosing closer suppliers. The second reason is that pizza is glossary that may spoil quickly, therefore, it is important for producers to spend a minimum time for movement of raw materials or final product in general. Figure 2 shows the main suppliers of manufacturer (Fig.2):

Figure 2. Pizza Hut`s suppliers*
*Source: (https: // vdocuments. Net / supply-chain-comparison-mcdonalds-dominos-pizza-hut-india. html)

As depicted in this figure, Pizza hut deals with two groups of suppliers for buying raw materials during pizza production: direct suppliers and indirect suppliers. There are three direct suppliers of Pizza Hut named Pepsi Company, Buns and First mineral water. Indirect supplier are meat market, vegetables market, sauces companies (Supply chain report, 2016). The main ingredients like mozzarella, pepperoni cheese from Australia and Spain. It`s important to deliver raw materials in time for food industry representatives, because such products may spoil faster. Therefore, manufacturers focus on finding ways for procurement optimization. In this way enterprise resource planning (ERP) system helps to manage the movement of raw materials for pizza preparation.

Both companies are good in procurement management, but in my opinion, Toyota is more advanced in professional and trustful relations with suppliers. It may be due to the fact that car production is a complex, risky and requires high quality and technologies accordingly which supported by perfect procurement.

Production and storage. Not only Toyota entire Japanese production is well-known as concentrated on high quality. Since its foundation, Toyota has been defending and using guiding principles in a way to manufacture reliable cars and to develop and launch innovative and high quality products and services, and so, it developed five general principles that are fundamental to its corporate culture (Toyota, Sustainable management report, 2016). Quality control is one of the most important aspects of supply chain management (Martin et al., 2014). Therefore, Toyota Camry produced by using Toyota production system (TPS). This system imagined in the figure 3:
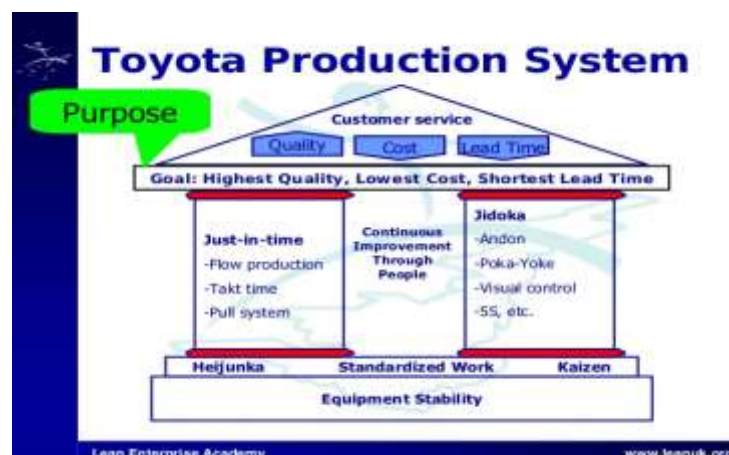

Figure 3. Toyota production system*
*Source: (http://yarus.pro/toyota-manufacturing-plant)

Toyota is often described as the company that invented Lean production (Martin et al., 2014). Toyota Camry prepared through using this concept of production, which ensure high quality and cost optimization. Taiichi Ohno and Shigeo Shingo were the primary creators of the Toyota Production System (TPS) and claimed: "We are reducing the time spent in the value stream removing the non-value-added wastes" (Ohno, 1988). They try to identify non-value-added wastes and delete them for optimal production.

Toyota believes in continuous development by adopting lean production process and is a pioneered in TPS. The system is designed on "Pull strategy" and customer is at the prime focus in the entire production facility (Essay UK, 2018). They use particular amount of inventories for production of particular cars.

Toyota Camry produced by using Jidoka system and Just in time system. JIT system – a system that organizes the resources information flows and decision rules that enable a firm to realize the benefits of JIT principles (Krajewski et al., 2006). Jit system helps to produce right qualitative product in right amount in right conditions. Such product satisfies consumers wants and needs.

The elements of just-in-time system are being pro-active in exposing problems, pull production based in Kanban, Total Quality Management, elimination of waste, reducing inventory through involving suppliers in planning process, continuous improvement, improving machinery and focusing on co-operation (TMC, 2018).

Pizza production based on JIT concept in Pizza Hut. It`s very important to minimize the inventories in food industry. Storage area frozen warehouse for frozen materials Dough preparation, leavening, sizing and filling of pizza are based on strict specification of production (Pizza Napoletana, 2010).

Pizza produced on base of specific concept, which called C.H.A.M.P.S: Cleanliness, Hospitality, accuracy, maintenance, product quality and speed. Cold storage capacity is between 100 tonnes and 1200 tonnes. Pizza Hut uses cardboard box – product packaging for take-away and delivery. Using ERP check daily inventory status control product scheduling. Forecast daily demand through the historic order data. Prepare exactly quantity of product will be served daily.

The similarities of both products in production is using JIT concept. Toyota Camry goes through a complicated manufacturing processuses than Pizza Hut cause of industry type.

Distribution and transportation. Relationship with retailer and dealers has undergone a sea change during the last decade for producer, mainly due to the changing preferences of the customers, who have become more aware and demanding. Therefore, it becomes imperative for the manufacturers to have long term strategic relationships with the retailers and dealers and consider them to be the crucial link in the supply chain (Vishal Gupta and Naseem Abid, 2017).

It applies "Toyota way" to manage dealers based on trust and complete freedom to dealers to make decisions, which helps them invest in right things to improve. Toyota believes in joint development with dealers and focus on organic growth with dealers (Supply chain of Toyota motors, 2018).

Toyota has 4 North American distributors and 30 distributors outside TMNA territory: Hawaii, Guam, Saipan, Europe, Gulf Coast Countries, Australia, South Africa and more. Moreover, Pizza Hut has 13 Vehicle distribution centers, 14 USA parts distribution centers (Toyota's Customer Centric Supply Chain Strategy, 2017). Such trustful relations and wide rank of dealers help to optimize the Toyota Camry production. On the other hand, it requires a high level of responsibility. Because it`s difficult to coordinate and control such big system. Therefore, Toyota focus on trustful and reliable relations with all participants of entire supply chain. Distributers from all over the world help to sale and lunch Toyota Camry with cost optimization and efficiently.

Pizza distribution channels located in big cities from all over the world. Pizza is distributed to 93 cities. CRM system data record helps to connect distribution channels with manufacturer. Through the ERP system and distribution center, their transportation can attain truck load to reduce transportation cost per unit (Pizza hut supply chain, 2016).

Pizza hut has 16 warehouses and 110 trucks (Supply chain comparison, 2014). Refrigerated truck the bases and fresh materials. For delivering Pizza to customer is used the cars/motorbikes and CX system of delivering. They try to deliver faster than competitors and establish reliability status among their customers. Therefore, Pizza Hut team distribute the pizza on three ways. Firstly, pizza is sold to consumers in local or foreign restaurants. Secondly, there are home delivery system in the distribution centers and people may order pizza delivery service. The third is online order according which consumer may order a pizza through internet.

Conclusion

As stated above, Toyota Camry`s supply chain more complicated due to the industry type. Toyota Camry`s supply chain focused on high quality, cost optimization, reliability, trustful relations among manufacturer, suppliers, dealers and customers. Production organized on the base of specific production systems such: TPS, Jidoka, Kanban, Lean production and JIT systems. I think this ensures high qualitative production with minimum costa. On the other hand, pizza production is less complicated process. But supply chain of Pizza deserves respect due to the fact that it implemented through using high technologies like ERP and CRM systems, CX system of delivery and JIT system in production. Therefore, Pizza Hut one of the leaders of market. Grocery production often requires quick movement, law level of inventories and better saving conditions cause of spoils quickly. Supply chain management is the success factor of both products.

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