

THE HYPER-PERSONALIZED SUPPLY CHAINS

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Abstract. *Today's customer has more choices than ever. Customers always have had high expectations about what is in the items they buy. This desire for clarity has heightened the need for supply chains to provide more, and more granular, content. To succeed in today's business environment, companies need to meet consumer demand for in-depth product information across a variety of shopping channels, with greater specificity, than in the past. Excellence in business is driven by consistent information. Today technology and innovation enable a much closer connection between the buyer and seller, paving new paths for experience and sales. Using them to build the hyper-personalized supply chain that delivers exactly what the customer wants, when, where and how they want it will become the paradigm of modern supply chain management. Personalization (creating a progressively better customer experience by using technology and data to meet and anticipate its needs in a way that makes their interactions easier) is a growing challenge, particularly for supply chains strongly influenced by global competitors. Personalization is fueled by new technologies and new data sources, all leading to more impactful customers insights. In this paper we will examine how personalization today is not only a strategic imperative for companies, but also for their supply chain partners in order to reach better profitability and increased customer lifetime value.*

KEY WORDS: SUPPLY CHAIN, CUSTOMIZATION, PERSONALIZATION, MULTICHANNEL ENVIRONMENT, SHOPPING BEHAVIOR, ONLINE CHANNEL.

INTRODUCTION

Personalization is one of the most dominant and fastest growing trends today (9). Personalization is based on the use of consumer data and technologies to better predict and meet their needs, as well as to establish more intimate interactions with them. The level of personalization increasingly determines the success of companies in today's multichannel world.

Supply chains realize the power of personalization and are increasingly resorting to it. Today, their flexibility and competitiveness must be based more on mass customization.

Regardless of the fact that economies of scale encourage supply chains to make each product the same, market circumstances require them to accept a segmented approach in product development. Therefore, for example, supply chain managers in some particular circumstances want to purchase, produce, and deliver products for a single customer. In other circumstances, these "personal" products can be directed at a wider but specific customer segment.

Today, customers function in an *omni-channel* environment. This environment allows overcoming the separation of offline and online sales, marketing and customer service, as all channels are synchronized with each other. In such an environment, customers can simultaneously use all channels to enhance their shopping experience.

Personalization is a way for the customer to gain a positive experience in relationships with companies in the supply chain. The customer experience in the purchasing process is a new brand and requires a strong connection of companies in the supply chain. In order to succeed in this new world of marketing, supply chains need to understand what it is that individual buyers want and why, and to invest in new technologies to provide customers with flawless experiences.

More and more often, customers start their search for preferred products before visiting physical sales facilities. Supply chains are challenged to keep this process flawless, in order to make purchasers and others loyal to their products.

1. PERSONALIZATION AS A FEATURE OF MODERN BUSINESS

Personalization means interacting with customers in an intimate and intuitive way. Personalization is a phenomenon that occurs in various sectors. Deloitte conducted a study on the basis of which he identified three levels of personalization (13). The first level of personalization is *mass personalization*, where products are changed to meet consumer preferences, using existing data without any input from (contributions of) consumers (other than obtaining their permission to use the supplied data). An example would be Amazon's personalized recommendations on its website. The second level of personalization is *mass customization*, which means

that products are massively produced, but the customer is offered a limited adjustment option for the product - such as choosing different colors. An example would be the NikeiD service provided by Nike.¹ Adidas AG also customizes its sneakers. Mass customization emerged almost two decades ago as the primary strategy used by companies in all branches of industry to profit from the heterogeneity of demand and a wide range of other consumer demands (10). The third level of personalization consists of creating completely individually *bespoke products*. In the event of a totally individually bespoke product (such as a particular software, for example), the customer is involved in the process of its creation from the beginning to the end of the process, so that the product is unique. Mass customization is a new paradigm in production and has an increasing implication on supply chains.

Personalization is the strategic imperative of all companies in the supply chain, because it contributes to the increase in their growth, efficiency, profitability and customer lifetime value. The ultimate goal of personalization is to profitably create a better consumer experience in the purchasing process.

Personalization is based on the use of data so that customers can easily find and consume what they want, how and when they want it, not just on the basis of past experiences or Internet searches, but also on the basis of understanding what is behind their preferences. Accenture Interactive has launched Accenture Genome - a personalization technology that uses interactions with customers to create Living Profiles based on unique aspects of customers. These Living Profiles can help guide orchestrated experience through personalization platforms, such as:

¹ *Since 2000, Nike has been offering NIKEiD service to its customers, which enables them to personalize and make shoes and clothes unique before purchasing. Customer becomes a designer while changing and giving some kind of a personal stamp to the selected product. Nike has thereby revolutionized the customer's perspective on shoes and experience related to their purchase. At first, customers were able to use the NIKEiD service in a virtual world - via the company's website. Later, this service was also offered to customers in the real world through more than 100 physical objects called NIKEiD Studios, located in the US, China, Canada, France, England and other European countries. The result is unique products (shoes, clothes, equipment) that the customer, in a fun and easy way, designed for oneself. Such products are to the customer's taste, carry his/her personal stamp and show his/her character. The NIKEiD website allows visitors to easily transform into creators and to choose their favorite model, color, materials, air sole and even to print personal messages. It is a new lifestyle that allows customers to take the power of creation and creation of the brand into their own hands. Nike's experience has shown that many customers want to pay more but to design their own products themselves.*

recommendation engines, data management platforms, rules engines (11) or inference engines – desktop tools for developing expert systems, campaign management platforms and experience optimization tools.

Personalization can be used to reduce customers' discontent and change the way they experience the company. Personalization says a lot about the company. For example, Amazon, although operating in accordance with the guidelines and rules, at the end of the day it keeps the customer at the center of everything.

The common mistake that companies make is that they underestimate the amount of effort to personalize demands from the perspective of logistics, supply chain, technology and costs. Successful personalization requires technology, change of assortment, change of organizational structure and use of appropriate sales channels. At the same time, it is a challenge for customers, because when a company offers too many options, that creates confusion and frustration among customers.

2. OMNICHANNEL ENVIRONMENT

After a *single channel, multichannel* and *cross-channel* sales approach, an *omnichannel* approach appeared on the scene. At the center of this approach is a customer and not a brand.

Today's customers have a greater choice than ever since they live in an omnichannel world. Omnichannel experience is provided to customers by: internet website(s), social media, mobile devices, promotion and advertising, new technologies, software solutions, reports and analytics, payment methods and sales locations. Omnichannel marketing, by coordinating and integrating all channels of customer engagement, provides a consistent experience. Each channel is familiar with the changes that have occurred in other channels, and each one receives valuable information on customer behavior.

Customers in the omnichannel world want to be connected to brands anytime, anywhere, via any device. They value consistent and personalized shopping experience but also transfer interaction from one channel to their next channel. In the omnichannel world, customers have been provided with a consistent experience, regardless of the course of their movement during the purchasing process. The customer can now find products or services through different channels (Google, social media, television, radio, print media, personal recommendations, etc.). So, today's customer is an omnichannel shopper because he/she has many different ways to find the products he/she wants.

3. CONVERGENCE BETWEEN ONLINE AND OFFLINE SALES CHANNELS AS A SIGN OF PERSONALIZATION

The supply chain concept, based on the demand-driven supply chain, has existed for more than a decade. This concept requires companies in the chain to be able to change production on the basis of short-term demand fluctuations.

In order to successfully maneuver in the tsunami of short-term demand fluctuations, supply chain companies, especially retailers, must be ready for hyper-personalization - to provide individual consumers with what they want, when, where and how they want it. More often, consumers want to choose products that reflect their preferences, to get them faster and to not have to pay extra for it. The practice shows that companies cannot meet such consumer preferences without comprehensive changes in their own supply chains.

Customers combine shopping through physical sales facilities and online shopping. This happens, for example, when a customer orders products online, visits a supermarket in his/her neighborhood and picks up these products. Similar possibilities are also offered to customers by Alza – the largest online retailer of consumer electronics in the Czech Republic, which since 2014 has been operating in several other European Union countries (Czech Republic, Slovakia, Hungary and Austria). It allows customers to order products via the website and to take them over in its physical sales facilities. Alza owns 53 stores and 90 AlzaBoxes. During

2017, it served 2.9 million individual customers and realized 7.9 million orders (1).

However, an increasing number of customers, especially young people, buy online, i.e. without going into physical sales facilities. Also, more and more purchases start online. According to research by the Chicago company IRI, about 76% of shopping trips in the United States begin online (4). Nevertheless, surely not all customers will realize all their purchases online.

The desire of buyers to find out information about the products they buy and use gets bigger and bigger. This desire increases the obligation of companies in the supply chain to provide customers with numerous and detailed product data (on environmental impacts, payment options, transport alternatives, etc.). By providing customers with access to product content information, manufacturers and retailers encourage the process of its purchase and use. Confidence of customers in what they buy and where they buy is significantly determined by the scope, accuracy and reliability of the available information.

Although it is clear to company managers that hyper-personalization is long-lasting and, from a standpoint of investment in modern technology, a very demanding process, it is very present in a modern business and changes its look. It is not hard to see that online shopping, which began to develop in 1994 with the online sale of Ten Summoner's Tales, a CD by the English rock singer Gordon Matthew Thomas Sumner, better known as Sting, and then expanded to other products (15), fundamentally changed consumer experience in retail. In order to become and remain competitive, retailers successfully differentiate according to what is most important to consumers - assortment, price, product presentation, inventory replenishment, personalization, delivery time, etc. (12). Some retailers succeeded in it while others are still struggling.

Lately, the rules of the game have changed in online sales and thus the conditions for the personalization of supply chains. In 2017, Amazon bought (acquired) Whole Foods Market for \$13.7 billion, with the intention to increase its participation, in a profitable way, in the online food market where the fastest growing trends in online sales in the United States are manifested (7). Amazon is not unknown on the food market. Since 2007, it has been delivering groceries in the United States, and it has its own food store in Seattle. Amazon is aware of the fact that the Internet offers more and more opportunities to personalize not only the ordering of products, but also many other activities and supply chain processes, and that these chances should be maximized.

Regardless of the fact that there are still irreconcilable differences between the online and offline sales channels, their convergence is more and more pronounced in the markets around the world. At the same time, modern technologies increasingly impose, but also stimulate, the transformation of supply chains, in order to better meet the needs and wishes of individual consumers. The said acquisition provides enough evidence for this. It was expected that, by the acquisition of Whole Foods Market, Amazon would significantly change the way of selling natural and organic food, just as it had changed the way of selling books at one point, and that the sale of these food products would remain in the shadow of selling other products. However, this did not happen. Even the Whole Foods Market continued to operate under its own brand. This acquisition has undoubtedly shown that for effective competition in the food market, there is a need for ever-increasing convergence between the online and offline channels of their sales, as well as a strong local presence in the field. Which is what Amazon has achieved by the acquisition of the Whole Foods Market (2). In addition, this acquisition is a clear invitation to food business managers to quickly transform demand-driven supply chain into consumer-driven supply chain. It is a gold standard for the supply chain. This transformation affects, positively or negatively, all companies - regardless of how they sell their products to customers (online or through classical sales facilities) and the type of products they sell.

4. TECHNOLOGICAL FOUNDATION OF PERSONALIZATION IN RETAIL AND SUPPLY CHAINS

Investments in the supply chain increase the chances of sales growth. However, investments in online sales should be observed in relation to the number of physical sales facilities. Even after the takeover of Whole Foods Market, which was discussed in the previous section, and allowing the delivery of food to customers within two hours, Amazon achieves a modest success in this segment of business. Based on its research, Bricks Meets Clicks concluded that online orders of groceries from physical sales facilities amount to about \$200 per consumer per month, while Amazon's consumers order such goods less often and spend only \$74 per month (14). It turned out that Walmart, Kroger and Target, after having increased their investment in technology, sales facilities and food delivery to customers, each individually gained an advantage over Amazon because of having a large number of physical sales facilities (14).

Creating hyper-personalized supply chains requires increasing investment in a wide range of technologies. A key role is played by investments in technologies that enable:

- ordering by the end user, which is driven by artificial intelligence,
- automated inventory fill-ins,
- efficient inventory control.

Investment is also needed in technology that enables the strengthening of customer-seller relationships, increasing sales and creating new customer experiences. Increasing the level of integration of a number of processes of supply chains (e.g. ordering, production and delivery of products) should enable better satisfaction of everyday needs of individual customers.

Manufacturers and retailers are able to record an increasing number and a wider range of data (location, product characteristics, demographics, psychography, and behavior across individual channels) about almost every customer. By integrating such data, manufacturers and retailers can create more personalized customer experiences in sales facilities and increase their loyalty.

A good example of this is setting up *beacons* into a sales facility. Beacons placed in the sales facility interact with the customer by sending special personalized offers and greetings. The goal of the use of the beacons is to provide customers with hyper locally personalized offers based on their location in the sales facility. Another example is Marc's – a retailer in North East Ohio, which has distributed Allrecipes.com²'s beacons in sales facilities to enable their customers to receive personalized meal-related recommendations via the "Allrecipes Dinner Spinner" mobile app. After entering the Marc's sales facility, users of the "Allrecipes Dinner Spinner" application receive recommendations by local home cooks via their smart phones in relation to meals, together with recipes and products sold in that store. As a result, around 35 million views of Allrecipes.com's recipes are identified every month, made by customers using this application while they are in the Marc's sales facility.

Personalization of the offer is also possible with companies in public transport. In order to make it easier for pregnant women to find a seat in public transport, in 2016, South Korea's second-largest city, Busan, co-operated with Korean company Daehong, which implemented a pilot project called "Pink

Light". Devices with pink lights were placed in subway cars, and women were allowed to use beacons. When a woman with a beacon enters the subway, the pink light on the device turns on, which allows other passengers to find out that there is a pregnant women nearby in need of a seat.

Online customers expect the company to treat them the same as offline customers. Online customers want the company to recognize them upon their arrival, to remember their unique preferences and pay attention to them as well as provide them with recommendations for easier navigation in a particular situation.

Retailers need to choose the appropriate option to refill inventory. Most retailers use more options to fill in inventories, such as distribution centers, retail outlets and deliveries directly from sellers (*drop shipping*).³ Choosing the right option to fill in the inventory is crucial for companies that want to reduce their expenses by meeting the growing consumer expectations.

All the resources of companies in the supply chain should always be in the service of individual customers. The supply chain is not perfect, but its success depends on the application of technologies: for ensuring the visibility of its processes, activities and flows; for predicting potential problems; and for informing individual customers about each stage of the order execution process (fulfillment process - reception, processing and delivery of orders to end consumers).

Any decision in the supply chain, whether it concerns the introduction of new technologies, the employment of workers or the selection of the location of sales facilities, should be based on the wishes and needs of individual consumers. Companies in the supply chain must increasingly take into account the fact that the customer - an individual - is now one market.

5. PROVIDING A FLAWLESS CUSTOMER EXPERIENCE

More often, customers' expectations overcome companies' efforts to adapt the offer to their requirements. Due to the endless number of choices, it is more likely that customers will make bad decisions, be less satisfied, and abandon this experience. In such circumstances, companies need to humanize their digital experience by switching from marketing communications to digital conversations.

Managers of all companies in the supply chain know that their strategic focus must be on the customer. Due to the use of modern technologies, customers are becoming more sophisticated and more powerful. Companies that know the preferences and interests of their customers can benefit more. By analyzing relevant data of MyBuys⁴, whose database contains shopping behaviors and intentions of 250 million customers who use about a billion devices for Internet access and online shopping (8), it can be concluded that customer-focused marketing enables the increase in overall online

² *Allrecipes.com*, the world's largest social network focused on food, annually receives more than 1.3 billion visits from local chefs who interact with and inspire each other through recipes, photos, reviews, collections, videos and customer profiles. Since its launch in 1997, this website based in Seattle serves as a dynamic, irreplaceable resource for chefs of all levels who are looking for reliable recipes, fun ideas, food offers and practical cooking tips. Allrecipes is a global, multi-platform brand with 19 websites and three mobile apps serving 24 countries in 13 languages. It is owned by Meredith Corporation, which has about 73% of millennial women in the US in its portfolio.

³ *A supply chain management method that implies that the retailer does not keep goods in stock, but instead transfers details related to customer orders and shipments to the manufacturer, to another retailer or to a wholesaler who then sends the goods directly to the consumer. De facto, drop shipping is a retail selling method where the seller does not hold the products sold in the warehouse. Instead, a seller who sells a particular product buys it from a third party and sends it directly to the buyer. As a result, the seller never sees or manipulates the product. The biggest difference between drop shipping and standard retail sales is that a trader who sells goods does not have those goods in stock. Instead, that trader buys stocks, if necessary, from a third party (usually from a wholesaler or manufacturer) to carry out orders.*

⁴ *MyBuys provides coordinated personalizing solutions for display ads, e-mails, websites and mobile devices to retailers, manufacturers and agencies. It automates and delivers billions of targeted offers each day using its Active Shopper Database comprised of 250 million consumers. MyBuys is headquartered in Silicon Valley. Since 2009, it has been named the top provider of personalization solutions to the IR500.*

sales by 25% as well as a certain increase in customer lifetime value.

The ultimate goal of personalizing an online offer is to create an impression of the right one-to-one relationship with customers. According to a recent study by Infosys, a global leader in the field of consulting and technology services, 86% of customers and 96% of retailers pointed out that personalizing online offers had at least some impact on purchasing decisions. And a research conducted by Synqera⁵ showed that 85% of customers wanted personalized online offers that reflect their previous purchasing behavior.

However, personalizing online offers is one of the biggest challenges for retailers. Creating a flawless shopping experience through all sales channels is a game that carries high risks. Competition is fierce, and the most valuable customers (in terms of the lifetime value) are those who buy via multiple channels. Online sales are definitely growing. It is therefore not surprising that, in 2018, it was exactly online sales that were responsible for about 50% of the growth of the CPG⁶ (*Consumer Packaged Goods*) industry in the US.

CONCLUSION

Today, buyers buy whenever they want to. In order to serve such customers, supply chains need flexibility, full visibility (insight into all progresses, processes and activities) in real time, use of stores as a warehouse (helps to reduce costs and increase customer service) and a decrease in out-of-stock products by filling them in from all locations. This increases the ability to meet customer expectations, with the optimization of delivery costs, delivery rates, labor costs, and number of executed shipments.

Personalization is an act of dynamically creating unique production lines that provide customers with a collection of experiences not offered by any other traders on the market. Personalization means creating each individual's experience in a flawless way through the channels. This includes all interactions in the supply chain, such as sales, purchases and providing services.

Most companies have made some progress in their personalization path. Efforts of companies on this path are accelerating in all branches.

Mass customization is increasingly supported by supply chains. It can even be said that this is the age of hyper-personalized supply chains. They implement modern customer service technologies, but they also provide a high level of visibility of

⁵ *Develops in-store communication technologies that allow consumers a personalized shopping experience in physical sales facilities.*

⁶ *Retailers sell products to the end user / consumer. Typical CPG retailers are Walmart, Target, Amazon and Costco as well as all stores that we see in shopping malls. CPG refers to a wide range of manufacturers, sellers and marketers (those who promote or sell products) of physical products used by consumers or sold through a retailer. It can be said that CPG companies control the production and distribution of products. Such are, for example, Procter & Gamble, General Mills, Clorox, Nike, Adidas, Johnson & Johnson and Apple. CPG companies often have retail items. For example, Gucci, Prada or Dolce & Gabbana are technically CPG companies, since their primary activity is the design and sale of handbags, often to retailers of high quality products such as Barneys, Saks and Neiman Marcus. However, they also have sales facilities in which they exclusively sell their own products. CPG companies make and sell products to end consumers, and their own brands compete with retailer brands. CPG companies are increasingly entering the retail sector through their own classic sales outlets and via e-commerce, expanding both brand recognition and chances of profit. For example, in 2012, Nike increased its sales by opening its classic sales facilities and via e-commerce. In 2012, Adidas opened more than 2,000 stores and significantly increased sales. In 2001, Apple opened its first store (Apple stores) and in 2012 more than 400 of such facilities made up about 12% of total revenues.*

processes, activities and flows between their members. Increasing investments in technologies that enable the creation of hyper-personalized supply chains (which provide exactly what the consumer wants, when, where and how he/she wants it), becomes a requirement for companies' competitiveness.

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