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## **The use of self-checkouts as an organisational innovation in customer service in the FMCG sector**

### **Wykorzystanie kas samoobsługowych jako innowacji organizacyjnych w obsłudze klienta w sektorze FMCG**

**Abstract.** The aim of the paper is to evaluate the use of self-service checkouts understood as organisational innovations from the perspective of the customer of a shop chain in the FMCG sector. Participatory research was conducted in which a total of 46 observations were made in the Auchan and Biedronka chains shops located in three Polish cities. Traditional checkouts have been found to provide the consumer with a faster shopping experience when queuing times are not taken into account for the consumer. A number of factors influencing the time taken by consumers to make purchases were identified. Among those the knowledge factor was identified as a key element in bringing together the perspectives of the buyer and the company to mutually benefit from organisational innovation.

**Key words:** innovation, FMCG sector, self-checkout

**Synopsis.** Celem artykułu jest ocena wykorzystania kas samoobsługowych rozumianych jako innowacje organizacyjne z perspektywy klienta sieci sklepów z branży FMCG. Przeprowadzono badania uczestniczące, w ramach których dokonano łącznie 46 obserwacji w sieci sklepów Auchan oraz Biedronka mieszczących się w trzech polskich miastach. Stwierdzono, że kasy tradycyjne zapewniają konsumentowi możliwość szybszego dokonania zakupów w przypadku nie uwzględnienia czasu oczekiwania przez konsumenta w kolejce. W trakcie badań wyróżniono wiele czynników wpływających na czas dokonania zakupów przez konsumentów. Określono obszar wiedzy jako kluczowego elementu w łącznie perspektyw nabywcy i przedsiębiorstwa w celu obopólnego czerpania korzyści z innowacyjnych rozwiązań organizacyjnych.

**Słowa kluczowe:** innowacje, sektor FMCG, kasy samoobsługowe

**JEL codes:** O32, D12

## **Introduction**

Companies operate in a socio-economic environment and there is competition between them, both for available resources and for the ultimate buyers of the products or services produced. Competition between enterprises is an immanent feature of the economy [Walczak 2010] inextricably linked with their functioning. Nowadays, in view of the increasing specialisation of individual sectors of the economy, competition for resources and consumers increases, particularly during crises which are an inevitable element of the business cycle

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occurring in a market economy. Recessions, which appear at periodic intervals, force companies to organise work better than before and to allocate the organisation's resources more efficiently so that, despite the downturn, they can gain an advantage over their competitors. One of the ways of gaining competitive advantage are innovations, as well as technologies which, being carriers of new solutions, create new competitive opportunities [Sołoducho-Pelc 2017]. Depending on the economic sector, the nature of business rivalry differs in many aspects due to the specifics of the area. Companies can compete both through pressure for lower prices and by specialising in high quality customer service. In the case of the FMCG sector, one of the areas in which companies compete is the customer service that ensures both a high consumer shopping experience and, from a firm perspective, an efficient customer flow. Particularly significant in this regard is the final stage of purchasing products in a shop, during which payment for the products occurs. At this point in the sales process, delays can appear in the form of the customer having to wait for service and the opportunity to pay, which consequently affects the ultimate satisfaction of the buyer. Due to architectural and personnel constraints, retail chains are forced to look for solutions to ensure a smooth customer flow. Innovations such as self-checkouts enable retail chains to streamline the flow of customers through the final stage of their purchases, while also allowing efficient time management for the staff employed, as well as maintaining a sufficient sense of comfort for the consumer. However, do the perspectives of the company and the customer overlap, and does the consumer actually purchase more efficiently and quickly using self-checkout compared to checkouts operated by staff employed in the shop.

## **Materials and methods**

The primary objective of this paper is to evaluate the use of self-checkout as an organisational innovation from the perspective of the customer in the FMCG chain shops. Due to the growing competition in the sector, as well as the occurrence of an additional factor in the form of a crisis situation related to the SARS-CoV-2 pandemic, retail chains are looking for innovative solutions allowing them to simultaneously build sustainable competitive advantage and maintain high quality customer service.

Participatory research was conducted, where data was collected from April 25, 2020 to December 31, 2020 in FMCG retail shop chains such as Auchan and Biedronka located in Warsaw, Olsztyn and Janów Lubelski. The selection of the research sample was purposively random. As part of the research, time measured occurred during the final stage of the purchasing process. A stopwatch was used to achieve this and the measurement of time started when, in the case of a self-checkout, the customer started scanning the first product from his own shopping basket, or in the case of a traditional checkout, the employee started scanning the first product from the customer's shopping basket. Time stopped at the moment when the buyer made a payment for the purchased products. In order to make the collected data easier to compare, the waiting time in the queue was not taken into account. Due to the possibility of speeding up the shopping process by scanning several identical products by a staff member, each product was counted separately. During the participatory research made 46 measurements. In the case of self-checkout made 20 observations, during which a customer paid for products on each occasion by a payment card. In the case of traditional checkouts, 26

observations made, in which the purchaser paid by cash on 4 occasions. Each individual time measurement had a assigned number corresponding to the amount of products in the consumer's shopping basket. The number of products in the shopping basket was divided by the obtained time measurement. Following the calculations made, a coefficient was obtained to enable comparison between the types of checkouts on the speed of purchases. The data obtained from the participatory research used as the main source of data. On their basis made a comparison of the speed of the consumer's purchases depending on the type of checkouts selected and made an analysis of the factors influencing the results obtained. A detailed review of the literature on the subject allowed the conclusion that there are no available studies in the analysed area. Due to the non-representative research sample, the conducted study is a pilot research.

### **Innovation as a source of competitive advantage**

The essence and ways of building a competitive advantage have always been of interest to researchers. One of the concepts presented by Hamel and Prahalad [1990], where they considered the basis of a competitive advantage to be company's key competences, is recognised as skills that significantly affect the results achieved by a company. An organisation's possession of unique knowledge resources provides opportunities for sustainable competitive advantage [Beyer 2012]. A different perspective on the issue of competitive advantage is presented by Porter [2001], who stated that competitive advantage stems directly from the value created by the company for the customer. Competitive advantage is a condition that enables a company to obtain multiple benefits, which is an essential element in the long-term success of an organisation [Stankiewicz and Prochorowicz 2016].

Creating competitive advantage is determined by many factors, and innovation is always in the group of conditions of major relevance to the growth of an enterprise [Kokot-Stępień 2017]. At the same time it is an instrument that raises the efficiency of managing the resources of an organisation as well as increasing the effectiveness of competing in a given sector of the economy. As Lahovnik and Breznik [2014] point out, innovation is an engine for economic development, being at the same time a core process of the enterprise, and changes in the socio-economic environment can generate more and more new opportunities for companies. Innovation is the basis of competitive advantage and plays a dominant role in a company's success. And the ability to continuously generate innovation is one of the most critical capabilities in today's business environment [Lahovnik and Breznik 2013]. As Monika Inków [2020] points out, organisations that are strategically oriented towards innovation and the search for new development opportunities are more likely to achieve sustainable competitive advantage than companies that focus on quality and costs. At the same time, Sławińska [2011] emphasises that when considering innovations from the point of view of a company's competitiveness, it is important how quickly the market accepts innovations. Through the effective use of available resources by organisations and by creating innovation, competitive advantage can be achieved.

In the case of building a sustainable competitive advantage, organisational and process innovations have particular relevance. Process innovations make it possible to increase productivity and efficiency in a given organisation by lowering production costs or improv-

ing the quality of goods sold by the company [Pałucha 2015]. On the other hand, organisational innovation contributes to increasing productivity at the same time as improving a company's or organisation's ability to learn and use acquired information or technology. Indeed, when an entity is a technological imitator, the problem may be the relatively lower sustainability of competitive advantage therefore it is important from the perspective of the organisation to create new ideas [Godlewska-Majkowska et al. 2016]. The company's unique offer makes it possible to reach the final customers in a more effective way and at the same time distinguishes the company from its competitors. Contemporary enterprises, through constant development and implementation of innovations, create new markets and customer needs, at the same time making it possible to create competitive advantage [Włodarczyk 2013].

As Urbancová [2013] highlighted, organisational learning and knowledge management directly influence organisational innovation, which in turn affects organisational performance, reflected in the company's position in a given economic sector. Also other researchers indicate that the source of competitive advantage is the ability to create innovation as a result of the organisation's key knowledge assets [Kuźniarska 2018]. On the other hand, Pałucha [2014] stressed that each enterprise striving to build a strong position on the market must undertake innovative activity, which requires appropriate information resources and specific knowledge, and therefore uses intangible assets of the organisation.

### **Characteristics of the FMCG sector in an increasingly competitive environment**

One of the segments in the economy is the sector of FMCG (fast moving consumer goods), which includes products such as food including alcoholic and non-alcoholic beverages, tobacco products, domestic detergents, cosmetics, clothing [Ciechomski 2010]. The characteristics of fast-moving products affect where consumers can buy them. In the case of stationary retail, places such as hypermarkets, supermarkets, discount stores, convenience stores and specialty shops are available for customers [Sławińska 2016]. Despite the enormous diversity of markets and trading formats across the sector, competition is increasing both globally and regionally and the level of competitiveness of a retailer depends critically on the scale of its operations [Kondej 2019]. Therefore, companies willing to develop and be successful on the market have to constantly improve the offered products or services, constantly searching for and implementing solutions characterised by high innovativeness [Kokot-Stępień 2017]. The specific nature of the FMCG sector influences the character of competition by putting particular pressure on sales revenue growth and competing within the segment with low prices.

In Poland, the FMCG sector has gone through a number of transformations since the political transformation, with discount stores gaining particular popularity in the first decades of the 21st century. By offering consumers private label articles characterised by significantly lower prices with an acceptable level of quality of these products allowed the development of chains such as Biedronka, owned by the Portuguese consortium Jerónimo Martins [Kondej 2019]. Due to the changes that are taking place in the Polish FMCG market, convenience stores, whose number is constantly increasing year by year [Momot et al. 2016], characterised

by their close location in relation to places and routes used by consumers on a daily basis, are currently gaining importance [Kubacka 2006].

However, in terms of sales revenues, the market leader in Poland is still the discount retail chain Biedronka (Figure 1), whose revenues in 2019 amounted to nearly PLN 56 billion. Second on the list is German discount chain Lidl with a much smaller sales revenue of PLN 19 billion in 2019. The largest discount retail chains operating in Poland between 2006 and 2019 have significantly multiplied their sales revenues, the Portuguese consortium Biedronka by nearly 8 times and Lidl by over 6 times. At the same time, the growth rate of the most important competitors in the sector isn't as significant, which allows discount stores to continue maintaining a major position in the market, as well as devoting more resources to further development.

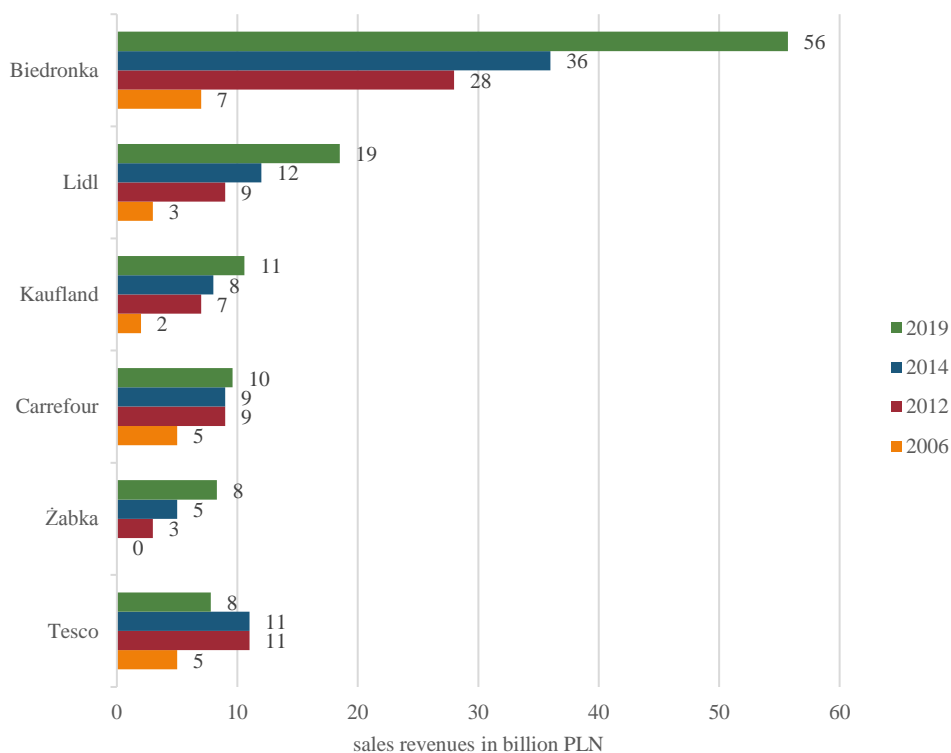


Figure 1. Sales revenues of selected FMCG retail chains from 2006 to 2019 (in billion PLN)

Rysunek 1. Przychody ze sprzedaży wybranych sieci handlowych FMCG w latach 2006–2019 (w miliardach PLN)

Source: own research based on [Polska Izba Handlu 2016, dlahandlu.pl 2020].

For modern companies, the customer has become a value that is worth and should be sought [Liczmańska 2017]. As Matic et al. [2019] state, today's consumers are willing to spend less time in the shop, and for that short time they require more information about the products they want to buy. Therefore, in order to meet the growing demands of customers,

FMCG retail chains are focusing more and more attention on customer service. Simultaneously, Hsieh [2005] points out that the implementation of self-service technology can improve the services that enterprises provide to their customers, making it easier and more affordable to make purchases. By introducing self-checkouts in their shops, companies are reorganising the existing workspace of staff and changing the existing flow of customers through the checkout stands located in the store. Self-checkouts force the consumer to take over part of the worker's role during the transaction, which is beneficial from a business perspective, representing a source of potential savings and efficiency gains [Fernandes and Pedroso 2017]. Shim et al. [2021] note, self-service capabilities are able to reduce labour costs and attract more customers. With self-checkouts, companies are able to shift some of the work from employees to consumers, creating an environment where the purchaser is an active participant in the process that they ultimately consume [Johnson et al. 2020]. Modifications to checkout stands through the implementation of self-service solutions in FMCG retail chains reduces interactions between staff and shopping customers, which as Beatson et al. [2007] points out can affect to a consumer satisfaction. At the same time, Lee and Leonas [2020] argue that self-checkouts have great potential, particularly in relation to the shopping experience of young consumers, who have increasing purchasing power and who prioritise convenience in the purchasing process.

As Sławińska [2016] notes, innovation in retail should be considered from two perspectives, i.e. the potential benefits for the customer and for the company. This is particularly important because self-checkout technologies can benefit both consumers and organisations. At the same time, they present challenges that may cause purchaser reluctance [Johnson et al. 2020].

## Research results and discussion

The results of the research indicate that the buyer's choice of payment method is an important factor in the time at which the customer of an FMCG chain purchases. The way in which the consumer pays for products also has an impact on minimising mistakes made by shop staff. A detailed summary of the selected payment methods for purchases made during the research can be found in Table 1.

Table 1. Chosen payment methods for purchases made during the research  
Tabela 1. Wybrane metody płatności za zakupy dokonane podczas badania

Name of the shop	Self-checkout (no. of items)		Checkout (no. of items)	
	card payment	cash payment	card payment	cash payment
Auchan	12	0	9	1
Biedronka	8	0	13	3
Total	20	0	22	4

Source: own research.

The number of products scanned in one checkout could be used as an indicator that allow to compare the specified types of checkouts effectiveness. The obtained results, presented in Table 2, clearly show that the traditional checkouts are the quicker way for an FMCG customer to make a purchase. In one minute, the employee is able to scan more than twice as many products as the purchaser in the case of cashless payment.

Table 2. Number of articles scanned in 1 minute in the researched checkouts  
Tabela 2. Liczba artykułów zeskanowanych w ciągu 1 minuty w badanych kasach

	Self-checkout (no. of items)			Checkout (no. of items)					
	only card payments			only card payments			card and cash payments		
	mean	max	min	mean	max	min	mean	max	min
Auchan	8.35	11.46	4.14	18.98	25.89	10.91	18.49	25.89	10.91
Biedronka	6.66	8.57	5.00	14.01	15.00	5.90	11.38	15.00	5.90
Total	7.68	11.46	4.14	16.68	25.89	5.90	14.11	25.89	5.90

Source: own research.

There are many factors that affect how quickly a customer makes a purchase, and one of them in the case of a self-checkout is the software installed on the device. As Orel and Kara [2014] note in their study, the most common consumer objections to self-service checkouts were related to the difficulty of operating. Proper design of this element will enable more efficient customer service and translate into more effective product scanning. At the same time, Djelassi et al. [2018] highlight the relevance of interactive technologies when consumers self-scan products. It is very important to know how to use the self-checkout software that the customer has. Knowledge in this sense means not only faster purchases, but also greater satisfaction with making them. Simultaneously, Bulmer et al. [2018] draws a similar conclusion from their studies, pointing to the role of familiarity with self-service technologies, as well as the very high significance of shop employees in supporting customers.

Shop employees provide efficient customer service not only at traditional checkout stands, but also at self-checkouts. Similar conclusions have been reached by Sharma et al. [2021], who found that despite the increasing use of self-service technologies, frontline checkout staff are still important in the overall evaluation of the shopping process made by purchasers. Efficient service has a positive impact on final consumer satisfaction. As indicated by Collier et al. [2015] the presence of staff is one of the most important factors influencing customers' decisions to choose self-checkouts. At the same time, Hassan et al. [2014] emphasise the relevance of the staff management element at the checkout stand, as inadequate management can lead to consumer dissatisfaction, especially when the queue is long and service is slow.

## Conclusions

Retailers focusing on providing quality customer service are trying to develop additional services to facilitate the consumer shopping experience. One solution that fits this trend is self-checkouts, which, as an organisational innovation, modify the final stage of the purchas-

ing process, enabling FMCG retailers to speed up the final sales stage. However, from a consumer perspective, self-checkouts don't speed up the purchasing process. The software installed in the self-checkout has a major influence in this aspect, which, through the proper design of the handling system, can significantly speed up the process. As the authors of the publication emphasise, the familiarity with self-service technologies is not only important in terms of the speed of the shopping process itself, but also has a significant impact on the satisfaction of customers.

Companies using innovative solutions in the form of self-checkouts should also focus their efforts on proper queue management for both self-service and traditional checkouts. Long waiting times in checkout queues have a negative impact on consumers sense of comfort with their purchases. The convenience of the purchaser during the sales process is crucial to their positive feelings and ability to build a relationship with a particular FMCG retailer.

By choosing self-checkouts, consumers reduce the need to interact with in-store personnel, which, during the SARS-CoV-2 pandemic, is key to reducing the risk of infection for both customer and staff. At the same time, purchasers can be confident that they have bought exactly what they expected, minimising the possibility of an employee making the mistake of scanning a single product twice. Combining the perspectives of businesses and consumers, an important element is the increased relevance of the factor of purchasers' knowledge in the use of self-checkouts, creating opportunities for mutual benefits.

Due to the complexity of the phenomenon and the number of factors influencing the final outcome of the study, a sufficiently large amount of data is required to be able to analyse the processes occurring in this area with much greater accuracy. It is important to continue research efforts in the future to evaluate self-checkout technology both from a consumer and a business perspective..

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