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**The transformation of food retail: Analysing the influence of automated commerce on traditional stores, supermarkets, and e-commerce platforms**

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# 1. Introduction

## 1.1. The background and significance of the research

The transformation of food retail has been a topic of interest, particularly in the context of the COVID-19 pandemic. Traditional stores, supermarkets, and e-commerce platforms have all experienced changes in their roles and consumer behavior (Lu & Reardon, 2018). The growth of e-commerce, in particular, has had a significant impact on the food retail industry. Consumers have increasingly turned to online platforms for their grocery shopping needs, driven by factors such as perceived risk, convenience, and the availability of advanced technologies (Habib & Hamadneh, 2021). The COVID-19 pandemic has further accelerated this trend, with lockdowns and safety concerns leading to an increase in online grocery shopping (Habib & Hamadneh, 2021). The years I spent in traditional food retail gave me intention to further research on this topic and expand it to e-commerce too as I realized the significant technological evolution on this market. I find it crucial to investigate the trends in consumer behaviour as I interacted with them on a daily basis and experienced the importance of customer satisfaction.

The popularity of digital food shopping has increased during the pandemic, and there is a hypothesis that this trend will persist beyond the pandemic, potentially replacing physical shopping in our lives (Lu & Reardon, 2018). However, it is important to understand how consumers perceive and navigate the integration of offline and online channels in their purchase decision processes (Voorveld, et al., 2016). Factors such as e-service quality, consumer satisfaction, attitudes towards websites, and behavioral intentions play a crucial role in shaping consumer behavior in the context of e-commerce (Carlson & O'Cass, 2010).

The integration of digital technologies and digitalization has blurred the boundary between offline and online retail channels (Lu & Reardon, 2018). This integration has implications for both traditional retailers and e-commerce platforms. Traditional retailers considering entering e-commerce platforms need to consider factors such as consumer returns, referral fees, and the higher return rate of online sales channels (Cao, et al., 2020). On the other hand, e-commerce platforms need to ensure e-service quality and allocate resources to drive positive consumer satisfaction, attitudes, and behavioral intentions (Carlson & O'Cass, 2010).

## 1.2. Research questions

- How has the role of traditional and e-commerce changed after the crisis?
- Has the growth of e-commerce changed consumer behaviour after the covid?

- How has the popularity of digital food shopping changed in response to COVID-19, and does this trend, as hypothesized, persist beyond the pandemic, potentially replacing physical shopping in our lives?
- How will e-commerce be welcomed in the future?
- How has the integration of digital technologies and digitalization influenced the boundary between offline and online retail channels?
- How does the integration of offline and online channels in the retail industry impact customer satisfaction and loyalty?

To analyze these changes and understand consumer behavior, a combination of qualitative and quantitative research methods will be employed. Qualitative data collection through semi-structured interviews with a directors of supermarket chains can provide insights into the operational aspects and strategic perspectives of these stores. On the other hand, quantitative data collection through questionnaire surveys can help understand consumer behaviors, perceptions, and preferences within the context of food retail.

### 1.3. Structure of the thesis

In the first part of the thesis, the main objective is to introduce the main expressions related to the topic of e-commerce and provide an overview of the trends in e-commerce before and after the COVID-19 pandemic. The scientific goal of the research is a comprehensive examination of the role and characteristics of e-commerce and traditional retail in the light of the effects of the COVID-19 pandemic. Answering the research questions will help to understand the transformation of the retail sector and to analyze consumer preferences and behavior patterns. This section will explore the growth and evolution of e-commerce, highlighting key factors that have influenced consumer behavior in online shopping. The introduction will also discuss the significance of studying the impact of e-commerce on consumer behavior, particularly in the context of the COVID-19 pandemic.

The second part of the thesis will focus on conducting a comprehensive literature review to draw conclusions from secondary research. This section will involve an in-depth analysis of existing books, research articles, and industry reports related to e-commerce and consumer behavior. The literature review will explore various aspects such as consumer motivations for online shopping, factors influencing online purchase decisions, and the impact of the COVID-19 pandemic on e-commerce trends. It will also introduce the background of

automated shopping. By evaluating the existing literature, this section will provide a theoretical framework for understanding the relationship between e-commerce and consumer behavior.

The third part of the thesis will outline the research methodology employed to investigate the impact of e-commerce on consumer behavior. This section will describe the research design, including the selection of participants, data collection methods, and data analysis techniques. The methodology may involve both qualitative and quantitative approaches, such as surveys, interviews to gather primary data from consumers.

In the fourth part of the thesis, the collected data will be analyzed and the findings will be presented. This section will involve the interpretation and synthesis of the primary data collected from both consumers and companies. The data analysis will aim to identify patterns, trends, and correlations between e-commerce and consumer behavior. The findings will be presented in a clear manner, supported by relevant charts, graphs, or tables.

The fifth part of the thesis will focus on the discussion of the findings and their implications. This section will provide a critical analysis of the results, comparing them with the existing literature and theoretical frameworks. The discussion will explore the implications of the findings for both the customer side and the corporate side in the field of e-commerce and consumer behavior. It will also highlight any limitations or areas for further research.

The final part of the thesis will present a conclusion that summarizes the main findings, discusses their implications, and provides recommendations for future research and practical applications. This section will take a look back to the research objectives and research questions, highlighting how they have been addressed through the study. The conclusion will also reflect on the overall research process and its contribution to the understanding of the impact of e-commerce on consumer behavior.

## 2. Covid-19 and e-commerce, automated commerce rising

### 2.1 The Covid-19 epidemic

#### 2.1.1. The impact of Covid-19 on the world economy

The coronavirus epidemic, which originated at the end of 2019, rapidly spread globally by spring 2020. This resulted in a significant downturn in economic and social processes. The impact was not limited to services, but also extended to foreign trade. This global crisis has had a major impact on the entire trade sector. It led to the shutdown of air transport and tourism, which had previously been resistant to previous crises. There was a significant fall in global trade, as well as in economic activity. (ksh.hu, 2020)

New regulations came into force in the 1st quarter of 2020 and new measures to contain and to prevent the spread of epidemic. This has led to a significant economic downturn for market participants worldwide. The two largest players in the economy (US, China) have also experienced economic slowdown. (ksh.hu, 2020)

The economic problems caused by Covid have had a completely different impact on the market than those experienced in previous crises. Services outperformed products in the market in the early days. However, this sector was later also significantly affected by the changes in consumer habits resulting from the epidemic. Among the activities that suffered the most were construction and installation services, the automotive industry, film production, cultural services, passenger transport, tourism and tourism, transport and labour services. In addition, imports of government services have increased. More money was spent on virus protection and the purchase of various protective equipment. (hepa.hu, 2020)

#### 2.1.2. The impact of Covid-19 on Hungary

The beginning of the first wave of the coronavirus epidemic dates back to the first domestic outbreak of the disease, the first case of coronavirus registered in Hungary. The epidemic hit the country in several waves, the first wave of which, of course, triggered the restrictions that still partially exist in economic and social areas, and it is this period that I will focus on in detail with regard to epidemiological restrictions.

The first wave started in early March and lasted until early June. During this period, a number of measures were taken to control the epidemic, which had an indirect and direct impact on consumer purchasing patterns and thus on the e-commerce market. The first epidemic

measure came into force on 11th March, banning entry from the four most infected foreign countries at the time and reintroducing border controls at the Slovenian and Austrian borders. Shortly afterwards, on 16 March, a decree was introduced requiring education to be switched from traditional to digital, affecting not only university students, secondary and primary school students, but also their parents in large numbers. At the same time, restrictions on the number of participants in events were introduced, with indoor events being limited to 100 people and outdoor events to 500. In addition to the digital education decree, 22 measures prohibiting the entry of non-Hungarian citizens into Hungary and shortening the opening hours of restaurants, cafés and catering establishments to 3pm also came into force on 16 March. (Koronavírus Tájékoztató Oldal, 2020)

Perhaps the most radical of these measures came into force on 27 March allowing people to leave their place of residence only for good cause, for work or to buy basic necessities such as food, household goods and medicines. This order meant the temporary closure of most commercial establishments and service providers in other sectors, including hospitality and catering establishments. In addition, it has set a 9-12 hour shopping window in shops selling food and other basic household items, and in pharmacies, to protect the elderly. These initial measures alone have brought changes to people's daily lives that most generations have not experienced in their lifetime. Looking ahead to the second and third waves, not much has changed in terms of restrictions. The most important restrictions that remained or were reimposed included: alternating curfews during the waves, usually lasting several months, permanent closure of catering establishments and periodic closure of services requiring physical contact, permanent ban on events, temporary introduction of digital education and strict rules on entry and exit for both nationals and foreigners. (Koronavírus Tájékoztató Oldal, 2020)

People have had to face not only a reduction in freedom of movement and entertainment, but also the consequences of regulations that affect their regular lifestyles. The first to experience a more significant change in their lives were the families whose primary and secondary school children were forced to stay at home after the transition to digital education. This has also meant that in most families at least one parent has also had to stay at home or look after the child. In households where working from home was not feasible, parents were faced with a heavy burden, and could even be forced to take long-term leave or, in more extreme cases, quit their jobs. Computers and internet access were essential tools for digital education, and may have required additional financial capacity to finance them, thereby contributing to the rise in demand for computing devices. (Népszava, 2020) The sector which was the most



affected by the epidemic is still considered to be the hospitality sector, where most workers were forced to take temporary unpaid leave and then to resign and change sectors, but in the following I note this as well. (Portfolio, 2020) Most of the first wave restrictions were ended on 4 May in the countryside and on 25 May in Budapest, with the exception of the entry and exit regulations. (Koronavírus Tájékoztató Oldal, 2020)

Most economic sectors have been negatively affected by the impact of the epidemic. The main reasons for the downturn were factory closures, the change in the EU budget cycle and postponed investments. According to experts, these were the 5 most serious economic impacts in Hungary: (Portfolio, 2020)

1. Tourism has suffered a huge loss. The whole sector has been affected by the lack of demand, accommodation providers, restaurants, nightclubs, short and long term property rental market and other cultural and tourist entities.

2. Reduction of employment. Companies have been challenged by fluctuating order numbers and new rules and measures. As a result, many companies have set up new strategies for their employees, such as making working from home popular and eliminating redundant positions. This was more cost effective and easier to adapt to comply with the new regulations.

3. The automotive industry (Audi, Suzuki, Mercedes) accounts for a large part of Hungary's turnover. Subcontractors supplying factories have also been deeply affected by the fall in production. Many jobs have been lost. These 3 factories now employ nearly 25 000 people.

4. HUF exchange rate. Before the dramatic fall of the forint, before the epidemic began, the EUR was around 340 HUF, while today's price of one euro is close to 400 HUF.

5. The status of the construction industry. Shortages of raw materials, obstructed deliveries and imported/exported products have led to the halting of several projects, which later resulted in further delays and a pile-up of unfinished works.

### 2.1.3. The impact of Covid on the food industry

The coronavirus has not only changed industries, but also people's consumption habits. This can also be seen in food shopping. In the first wave, people got scared, which led to a drop in the number of shoppers and sales. Consumers went to stores where almost everything was available and started to panic buy long-lasting food. They favoured products with a greater expiry date, such as canned goods, rice, flour, yeast, etc. They avoided fresh products (dairy,

bakery, meat products). Time limits and shopping periods (shopping periods for the elderly) also had a significant impact on the drastic change in shopping habits and methods. These measures have had an impact on communication and generational issues, but have also played a major role in shaping economic outcomes.

In the second wave, shopping became more planned and targeted, thus shortening the time spent in the shop, thanks to the factors mentioned in the previous point. In order to avoid uncertainty, risk avoidance became the main concern, so the consumer basket was consciously put together. They feared not only the risk of infection, but also the uncertainty and difficulties of making a living as a result of the epidemic. They spent more time in their homes and their preferences changed. Demand for hygienic and healthy products increased. Price increases were also felt for these products. In many cases, prices for certain products were several times higher than the legal and legitimate profit margin. Prices often increased several times over (masks, hand sanitisers). In the second wave, people stopped buying long-lasting foods and preferred to buy products with the best value for the price and the ingredients. Demand for premium products fell. Alcohol consumption patterns also changed. Although people stopped going to restaurants and bars, many people increased their consumption of alcoholic beverages because they had to be locked at home. Home delivery of these products also became popular. Those who could, ordered food, ready-made meals and even various clothing, electronics and household items from home, thus reducing the risk of personal encounters and contamination. (Mezei & Gombkötő, 2022)

There was a spectacular increase in demand for domestic products, with people finding it safer to buy food from local food chains. Small producers were able to respond more flexibly to the challenges. Domestic products were used to fill the gap in the shops. The impact of the epidemic has highlighted the gaps and weaknesses in global food supply chains. The Hungarian

economy, and the Hungarian food industry in particular, responded well, recognising the potential for improvement. (Mezei & Gombkötő, 2022)

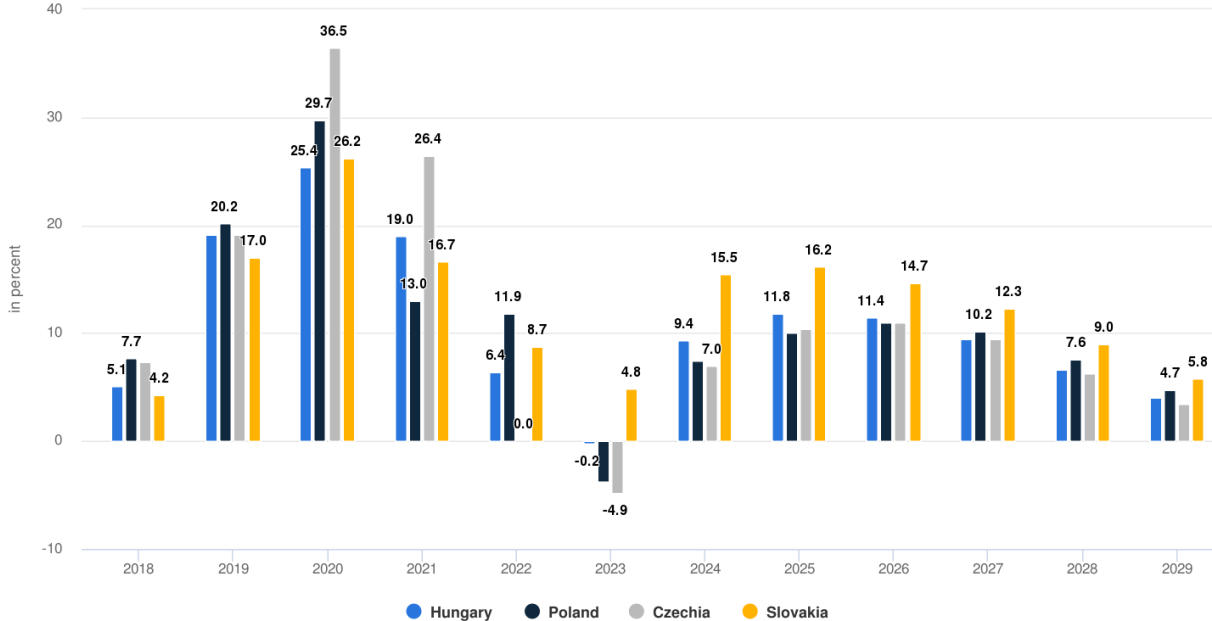


Figure 1: Food Revenue Change in Visegrad Group countries

The revenue change in the food market across the Visegrad Group countries (Hungary, Slovakia, Czechia, Poland) shows fluctuations over the years from 2018 to 2024. During the COVID-19 pandemic in 2020, there was a significant increase in revenue for all four countries: Hungary saw a 25.4% increase, Poland experienced a 29.7% rise, Czechia had a notable 36.5% surge, and Slovakia witnessed a 26.2% growth as well. This was due to factors like panic buying and increased consumption at home lockdowns. However, in the following years, the growth rates slowed down. For instance, Hungary's growth rate fell to -0.2%, Poland's to -3.8%, Czechia's to -4.9%, and Slovakia's to 4.8%, by 2023. These trends suggest a return to pre-pandemic shopping habits as the initial need for food shopping decreased. (Statista, 2024)

Overall, the outbreak has been an excellent illustration of the weaknesses of the food economy. This sector, apart from the catering industry, could not be shut down during the epidemic, as people needed their demands to be met. The biggest losers from the epidemic were poultry producers and producers of alcoholic beverages, due to the closure of restaurants and bars. These were among the units that were closed in the first stage due to the high risk of infection. The positive aspect of this period is the success of domestic products. Online shopping remains popular, but a significant part of the customers changed back to traditional shopping as before the Covid-19, and producers need to develop their own digital systems.

Shopping from home is more convenient, more cost-effective and can save a lot of time and energy. (Mezei & Gombkötő, 2022)

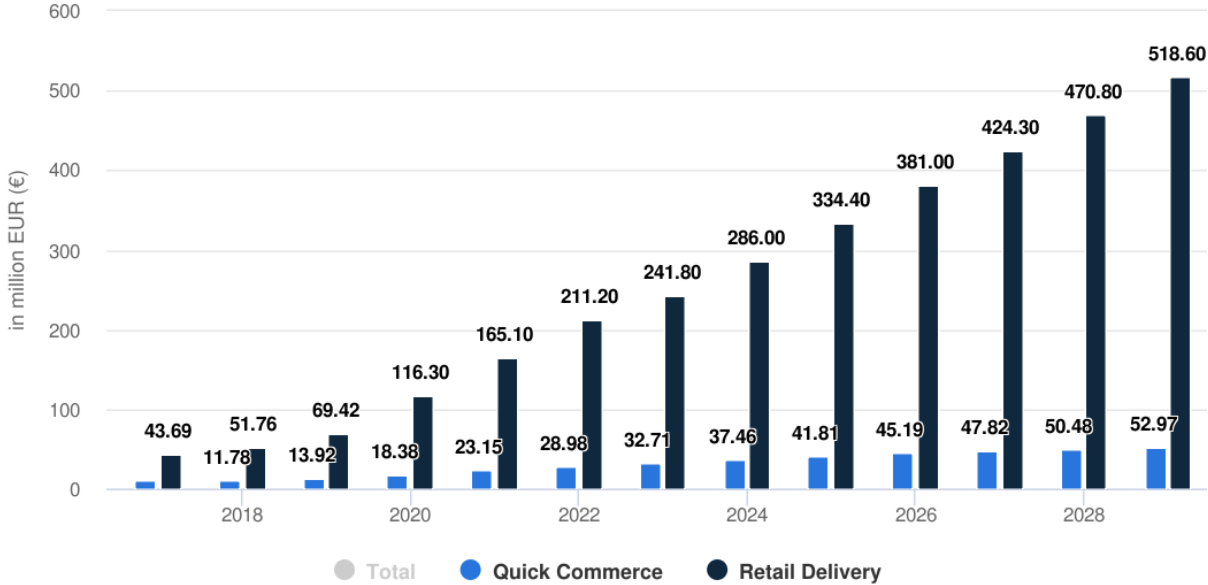


Figure 2: Grocery delivery revenue in Hungary (source: (Statista, 2024))

According to the datas from Statista, Hungarian customers are increasingly turning to online grocery shopping and delivery services due to the convenience and time-saving benefits they offer. With the rise of e-commerce and digitalization, customers are looking for ways to shop for groceries from the comfort of their own homes. Additionally, the COVID-19 pandemic has accelerated the shift towards online shopping, as more customers are opting for contactless delivery options. (Statista, 2024) The revenue of retail delivery almost doubled from 2019 to 2020, so it shows that the Covid-19 created an enormous need for food delivery, which may caused an unexpected change in the retail sector and their participants like Tesco and CBA had to adabt to the increased need in their online purchases. The projections for the following years enable us to see the huge potential that this market is yet to achive.

## 2.2. Trends in the digitization of food trade

The use of digital technologies is now common for both companies and consumers. Digitalization includes the display of objects displayed in analog form (number, image, text, film) and in digital form (binary codes). (Merriam-Webster, 2023)

The application of digital technologies changes the business model of a company, which opens up new revenue-increasing and value-creating opportunities through the creation of new functions by combining the existing functionalities. (Henfridsson, et al., 2018)

Digitization is not a new phenomenon in retail either as the use of barcodes has made it possible to digitize many retail processes (purchasing, logistics and sales). As the popularity of using the internet and smartphones grew, the consumers have also become an active shapers of digitalization. As a result, the previously independent digital processes controlled by retailers and consumers have become connectable and new areas of application have opened up in the retail sector. Furthermore, the intermixing of human actors and digital technologies in the retailing process has become common and this resulted empowering the consumers as the firms started involving them in their creation of value. (Nicolai & Grange, 2020)

Explained in more detail, it enabled them to handle activities such as collaborative co-production, social commerce and self-service. In addition to the changes of the actors, digitalization is transforming the retail settings such as physical stores and the homes of the consumers, by introducing new forms of settings enabled by mobile devices such as at the bus or at the tram while commuting. Many products are being digitalized, leading to new ways of extending offerings and pricing strategies. These enabled customized promotions, dynamic pricing and individualized communication. The most important conclusion of this is that digitalization has blurred the lines between offline and online channels, retailer and consumer as well as products and services. (Hagberg, 2016)

Digital tools are creating a new retail environment that includes online, mobile channels and retail stores. Verhoef and co-authors (2007) state that offline and online stores represent different offers and appeals to consumers, which can be integrated by the retailer to increase the consumer experience. However, the real driver of channel integration is that consumers combine multiple channels within a single purchase decision process. As a result, physical and digital channels merge during the purchase process. In stores, digital devices primarily help to search for information about products (interactive terminals, digital showcases or the smart mirror), to find your way around the sales area (intelligent shopping cart, radio

frequency identification, bluetooth and beacon), and to make payments. (Pantano & Viassone, 2015)

Digital solutions used in physical stores create value for customers by increasing the functional and hedonic experience associated with shopping. The digital applications appearing in the store are also able to strengthen the role of the physical channel. Because by visiting the store more often, the consumer can establish a personal relationship with the retailer, which increases customer satisfaction and loyalty. (Huré, et al., 2017)

In many cases, the online channel is intertwined with the physical channel in the form of click-and-collect or click-and-drive. (Hagberg, 2016) In this case, a significant part of the purchase decision process takes place online and only the transaction and the receipt of goods are carried out in physical channels. Tesco for example, has set up stores where you can't shop, only pick up goods and leave and the payment will be done. With the spread of online sales, retail companies have created additional new collection points, which are already leaving the store environment and the ordered products can be accessed at frequent traffic junctions. (Hagberg , et al., 2016)

## 2.3 Automated commerce and its impact on retail

### 2.3.1.: Transformation of customer experiences

Customer experiences are no longer static, they have become dynamic, constantly evolving, deeply intertwined with several factors such as shopping situations and gender dynamics. There is a multi-dimensional impact on customer experiences as they are no longer confined to one-dimensional interactions. Instead of that, they encompass a multifaceted spectrum which includes staff service, shopping environment, product experience and shopping procedure. These aspects contribute to customer satisfaction in both online and physical store shopping. (Pei, et al., 2020)

The significance of customer experience is a key factor which is affecting the customer satisfaction in the current retail market. Despite the influence of new information technologies and Internet on the shopping process, traditional customer experience elements remain relevant. Customer satisfaction is a core indicator of a retailer's success and long-term sustainable competitiveness, it is a vital source of competitive advantage for them, whether they operate in physical stores or online. In physical stores customer satisfaction is more significantly impacted by product experience and shopping environment, on the contrary online shopping emphasizes the importance of the shopping procedure. For both of cases the influence of customer services remain constant and needed. (Pei, et al., 2020)

Gender is an inevitable factor in the relationship between customer satisfaction and customer experience as for example women tend to focus more on their experience with the shopping environment and the product than men. Retailers should consider the moderating role of gender and invest in enhancing the customer experience with the shopping environment, product, and service procedure to boost customer satisfaction, particularly for these targeted female customers. As they craft unique and differentiated customer experience they will obtain sustainable competitive advantage in several shopping situations. (Pei, et al., 2020).

Automated shopping technologies such as self-checkout kiosks and autonomous shopping carts, have redefined the customer experience by providing unparalleled convenience and efficiency. They streamline the payment process, significantly reducing waiting times and enhancing the overall shopping experience of the customer. Personalization have become a key aspect in retail and with the many data analytics tools and artificial intelligence it has become easier for the retailers to make highly personalized product recommendations and promotional offers. (Orel & Kara, 2014) This can not just raise customer satisfaction but also give the retailers invaluable insights into consumer behavior and preferences. The appearance of cashierless stores, where customers can select items and exit without going through the traditional checkout process, made it possible to build frictionless shopping environments. These innovations led those stores to the point where they eliminated long queues and transformed the whole customer experience, which resulted increased customer loyalty. (Gazzola, et al., 2022)

### 2.3.2.: Advancements in operational efficiency and cost management

Smart retail stores are also proving to be pioneers in innovation of operational efficiency and cost management, in addition to offering customers convenient shopping experiences Many firms are deploying a range of technologies and strategies to optimize their operations. One of the most visible improvements in operational performance is the deployment of robots and automation systems within smart retail shops. These robots can carry out various tasks like restocking the shelves, managing the inventory and even assisting customers. (Guha & Grewal, 2022)

The automated shopping carts are equipped with cameras, sensors and machine learning algorithms – these can guide customers through the store, offer them personalized recommendations and their exit from the store is simplified as well as the traditional checkouts have disappeared. Smart stores use the advanced technologies like Radio Frequency Identification (RFID) and Internet of Things (IoT) sensors to track products in real time. Each

of the products in the store are equipped with an IoT sensor or tagged with an RFID tag. (Landaluce, et al., 2020) RFID technology is already being widely adopted across the retail sector. RFID tags can identify every product in a store with a unique identifying number; they reduce the need for human resources, and eradicate human error by automating processes; they enable simultaneous product scanning; offer real-time stock information; provide new ways of advertising; and increase the security of the staff, equipment, and stock. Thus, adding sensors in those tags can provide additional features, such as information about the room temperature, moisture, and product degradation. (Landaluce, et al., 2020)

These sensors and tags are able to continuously communicate with the store's central system, this way it is providing real-time information on the product's location, quantity and even its condition. Tracking these data, smart retail stores can make highly accurate demand forecasts as they analyze historical sales data, monitor current inventory levels and predict future customer demand. (Roussos, 2006). The problems called overstocking and understocking, which could lead to lost sales, have been solved as this forecasting capability helps retailers to avoid them.

With the above mentioned technological background, retailers can prevent shrinkage. Shrinkage in this context is the loss of inventory which can be related to factors such as shoplifting, employee theft, administrative error, vendor fraud, damage or cashier error. The smart stores use their real-time tracking systems to identify and address these issues. Efficient supply chain management is crucial for these stores consequently they use data analytics and blockchain technology to create their transparent and responsive supply chains. Blockchain allows them to ensure the product's traceability and authenticity this way reducing the risk of counterfeit goods and enhancing customer trust. Labor cost reduction has always been a critical factor for retail stores but with the improved technological background they minimized the need for human labor in routine tasks. (Dirican, 2015)

In a traditional retail store, cashiers are required to scan products, handle payments, and provide customer service compared to the smart retail stores where the store is equipped with sensors and cameras to automate the checkout process. This led to the elimination of the need for human cashiers and also speeded up the process, improving the customer's shopping experience. Another way of reducing labor costs is using autonomous cleaning robots. The robots are cleaning the store navigating by themselves so the need for human janitors to manually clean the store has been also eliminated. Similar to these, there are inventory management robots as well. (Dirican, 2015)



These robots can navigate store aisles, scan shelves to check product availability and pricing, and even alert staff when restocking is needed. By automating these tasks, the stores reduce the labor required for stock management. (Casamayor-Pujol, et al., 2020) Without the constant presence of human labor in the smart retail stores it enabled to implement energy-efficient technologies such as smart lighting and HVAC systems. As follows utility bills are reduced as well as the store's environmental footprint. Automation not only lowers costs but reduces human mistake when it comes to tasks like order fulfillment, inventory tracking or pricing.

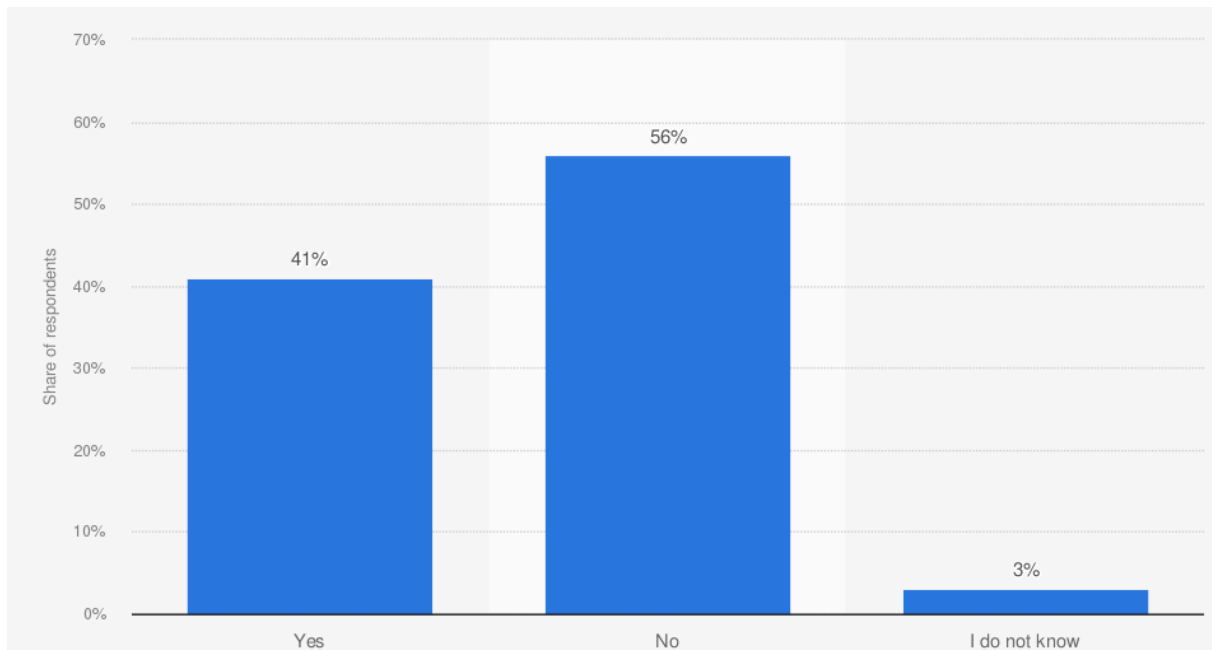
### 2.2.3.: Evolving roles of human employees

The deployment of artificial intelligence, robotics and data analytics improved various aspects of the operations in retail. To explore the dynamic landscape of human employment within the smart stores, we start focusing on the roles which have disappeared and then analyze the roles that have evolved to make a conclusion of the directions in which these transformations are taking place. One of the roles which is probably the most notable shift in smart stores and even in regular retail stores is the cashier. Most of the big supermarket chains introduced self-checkout kiosks, which enabled the customers to scan all of their product, pay for them and eventually leave the store scanning the proof of their transaction, to prove their purchase at the store. (Autor & Salomons, 2018)

The rise of smart retail stores made it possible for the customers to speed up the transaction process and reduce waiting times. They introduced frictionless payment options which basically simplifies the payment with mobile and digital wallets and in-app payments. These transformations led to the reduced need for cashiers. As mentioned above, managing the inventory is no longer a task which can not be done by the robots, which are constantly communicating with the smart shelves and RFID systems. (West, 2018)

Based on these datas, the AI is capable to manage the inventory, make orders for needed products for the suppliers. The basic customer service inquiries and the routine tasks connected to them took a major role in the customer service in the past, but we have reached the point where these tasks can be handled by AI-powered chatbots and virtual assistants. These automated systems freeing up customer service employees to address more complex customer needs, as these systems can only provide instant responses mostly to frequently asked questions. With this transformation, customer experience specialists can provide more personalized, empathic interactions also they can use their expertise to enhance the shopping experience and

build long-lasting customer relationships to increase the sustainable competitive advantage of the stores. (Madakam, et al., 2019)



*Figure 3: Main findings of the survey (source: (Statista, 2021))*

According to data from Statista, survey result from individuals in Hungary who participated in face-to-face interviews, found that a significant portion 40% of the participants, express fear about losing their jobs due to increasing automation. This concern comes from the potential that automation could replace human workers in different fields, leading to unemployment. These findings highlight the growing dissatisfaction among workers regarding the potential effects of technological progress on their jobs. As automation becomes more common in various sectors, it's essential to address these worries and ensure a smooth transition for workers. It is crucial to avoid any negative consequences on employment numbers to protect the living opportunities for people. (Statista, 2021)

Since retail stores are existing it has been a major problem to monitor thefts and inventory losses and to solve them the smart stores introduced automated security systems. These systems and cameras can help monitor for theft and unauthorized activities and make an alert while the employed loss prevention specialists can assess situations in real-time and then use their judgement to identify if it is really suspicious behavior and intervene if necessary. The physical presence of these employees can be a deterrent to potential shoplifters and they can

handle more complex security situations which may rise with the spread of smart retail stores. (Hagberg, 2016)

AI-driven technologies offer valuable insights for retailers enabling them to navigate economic challenges and make data-driven decisions to optimize their businesses, but it also increased the need for employing data analysts. These professionals are able to analyze the data recorded by the AI to track visitor activity, demographics and even sentiment data to build a customer profile. (Zhang, et al., 2016)

The role which never existed in retail stores is the AI system manager. These employees can oversee and optimize the technologies in relation with the automated shopping and inventory management. The managers ensure that those AI algorithms function effectively, if not they fine-tune systems to meet the evolving customer needs. One of their tasks is to provide training data for the AI as they are not static, they need continuous updates and retraining as new data becomes available. (Zhang, et al., 2016)

While the traditional roles in employment are fading away, the new positions emphasize the need for creativity, data analysis and customer-centricity. “I wouldn’t say these technologies ultimately add jobs, but the impact of robots often evolves over time from replacing human workers to augmenting them,” says Lee, a professor of technology and economy at University of Notre Dame. (Stowe, 2023) As smart stores continue to spread across the globe, the ability of human employees to harness the power of AI and automated solutions will be key in shaping the future of retail.

#### 2.4 The relationship between automated shopping processes and consumer behavior

A research paper from University of Bristol explores various aspects of consumer interactions with digital and human touchpoints in retail contexts. Results reveal motivations, preferences and discouraging factors leading consumers’ interactions with digital or human touchpoints when the both touchpoints typologies are simultaneously available. (Vannucci & Pantano, 2019)

	Sales personnel service	Digital service
Quality of service and interaction	Slow service delivery (discouraging service) Affected by number of consumers in the store.	Faster service (encouraging element) Not affected by number of consumers in the store
Trust perception	Sales personnel suggestions are influenced by the need to sell (certain products) (discouraging element)	Technology provides honest suggestions/recommendations (encouraging element)

*Table 1: Main findings of the research paper  
(source: (Vannucci & Pantano, 2019))*

Firstly, it offers a comprehensive exploration of the factors that influence consumer interactions with digital and human touchpoints in retail environments where both options are available simultaneously. Notably, it identifies the utility value as a primary driver for the adoption of digital touchpoints, particularly for expediting checkout processes and saving time compared to human-operated systems. Additionally, the research sheds light on the substantial impact of store crowding on consumer behavior, extending previous studies on this topic. By examining the effects of actual touchpoints - both digital and human - the study suggests avenues for mitigating the negative effects of crowding in stores. (Vannucci & Pantano, 2019)

Secondly, the research extends prior investigations into the role of sales personnel in retail settings. Contrary to expectations, the study reveals that consumers often prefer digital touchpoints over human interactions, especially when seeking faster service. However, when digital technology is challenging to use or malfunctioning, consumers may still opt for human assistance. This finding prompts a reconsideration of the role of sales personnel, suggesting a shift towards a facilitator role rather than controllers of consumer behavior. (Vannucci & Pantano, 2019)

Thirdly, the study goes into the simultaneous presence of digital and human service providers, addressing concerns about technology replacing traditional employee tasks. Despite initial concerns about trust in technology hindering its adoption, the research indicates a higher level of trust in digital touchpoints over human personnel when both options are available. This suggests that the role of digital technology is less critical when evaluating services in comparison to human interactions. (Vannucci & Pantano, 2019)

## 2.5 Trends and consumer preferences

### 2.5.1 Trends and changes in traditional food trade

According to Larry Hochman, consumers now have four key elements that have changed the balance of power in all kinds of business relationships: information, choice, power and control. Through collaboration and participation, they use each to create a form of unique value that suits them. You must share all legally disclosable information about who you are and what you do. If this is not done, a competitor will share the information, putting you at a distinct disadvantage. Choice gives consumers the freedom to pick their favorites: they can always leave you for a competitor. What people think and say about you matters more today than ever before. Word of mouth and your company's reputation are more important than advertising. Testimonials from consumers everywhere will provide unprecedented accuracy to all your existing and prospective customers, from people who have had real experiences with your products or services. In a world of unlimited choices, relationships are the only attraction that can keep consumers coming back to you again and again. In these revolutionary times, consumer associations will shortly hold enormous power, even greater than they have today, and they will know how to use it. The question is how to transfer some of that power to consumers before they take it away. (Hochman, 2010)

The new generation of consumers has grown up with the internet as a fact of life, a natural part of their world, and they take all these choices and this power for granted. The exercise of control is related to power, but it is far from being the same as power. Some businesses believe that they have more money and more resources at their disposal than any of their consumers, but when consumers come together and realize how much control they have, the true balance of power becomes very clear. In the long term, it will be how you can empower consumers and help them to create the value you share with them that will determine the fate of your business. (Hochman, 2010)

### 2.4.3 Consumer preferences

To understand consumer preferences, we need to look at the purchasing decision process. The process consists of five steps: problem identification, information gathering, evaluation of alternatives, purchase decision, post-purchase behaviour. During problem identification, the consumer becomes aware that there is a discrepancy between the current and the desired situation. For example, when hunger reaches a certain level, it becomes a stimulus,

in this case the need is triggered by an internal stimulus. However, if the individual enters Lidl, the smell of freshly baked pastries may also arouse the need, in which case the need is triggered by an external stimulus. In seeking information, the consumer may rely on four sources of information: personal (family, friends), commercial (sales, packaging, advertising), public (rating, inspection authorities), experiential (trial, testing). (Kotler, 2001)

Commercial sources are generally informative, while personal sources are confirmatory, evaluative. In evaluating alternatives, the consumer seeks to maximise the value to the customer. The customer value is the difference (Kotler, 2001) or ratio (Lehota, 2001) of the benefits and costs that the product provides to the customer. The components of benefits are perceived quality, product attributes, purchase process (convenience), possession (prestige), use and after-use. The input elements are price, time and energy spent on the purchase, consumer risk. There are six types of risks perceived by consumers: physical (toxic, spoiled food), functional (product not fit for purpose), financial (inappropriate price/quality ratio), social (not fitting in with reference groups, buying gifts), psychological (remorse when eating sweets during a diet) and time risk (lengthy purchase process). The purchase decision comes after the purchase intention, but there are two factors in between. (Kotler, 2001) One is the attitudes of others: how intense the attitudes are towards the brand and how important it is for the consumer to comply with the wishes of others. The other factor is the role of unexpected situations, for example a consumer loses his job, buying another product becomes more important. At this stage, the consumer may also make five minor decisions (brand choice, choice of retailer, decision on quantity, time of purchase, method of payment).

### 3. Research methodology

I needed statistical, quantitative data to answer my main research questions, but after I realized that I need qualitative data as well to answer some of my questions. So after collecting secondary data, I combined the elements of qualitative and quantitative research approach. I considered to make a structured questionnaire and semi-structured interviews to result the appropriate technique for my primary research. Certain phenomena and contexts can be explored in a better, deeper and more comprehensive way through the knowledge, understanding and analysis of the personal experiences, feelings and experiences of the selected interviewees. My selected interviewees were all directors at major supermarket chains in Hungary, this way their answers were more reliable than asking smaller retailers. In my

questions I asked them about the changes in retail after Covid, e-commerce and also the role of innovation and automation at their companies.

As my research is interested in the Hungarian context, it was not feasible to survey the whole population from a cost and technical point of view, so I used sampling. I spread my questionnaire research electronically (social media, sending it to friends and asking them to forward it), thus the snowball sampling method is the most identifiable among the non-random selection methods in my case. For my sample, I did not need to set any particular sampling frame in terms of the method used and the research questions, basically I wanted to gain insight into consumer behaviours, perceptions, and preferences within the context of food retail in the Hungarian population over 18 years of age. I used Google Drive Form to design the online questionnaire. The sampling was carried out on Facebook's news feed and various groups, where the snowball sampling procedure proved to be the most efficient, resulting in a total of 131 anonymous responses being received as a result of users spreading the survey among themselves. The questionnaire contains a total of 21 questions, of which 5 questions at the beginning of the questionnaire are related to the provision of background variable data. The remaining set of questions thematically covers shopping habits before and after the outbreak of the coronavirus epidemic, asking about the frequency of online purchases, online shop and product preferences, delivery method preferences and customer satisfaction. For most of the quantifiable closed questions, a multiple-choice response option was used. A 5-point Likert scale was used to measure individual decision factors and shopping habits.

In terms of background variables, I defined gender, age, educational level, place of residence and financial situation, and analysed the results along these lines. In the following, I will briefly present the basic statistics of the background variables of the sample.

<b>Gender, %</b>		<b>Type of municipality, %</b>	
Man	31	Budapest	24
Woman	69	Town	27
		Village	45
<b>Age group, %</b>		Other	4
18-25	21		
26-35	31	<b>Income situation, %</b>	
36-50	25	I can't live from my monthly income.	4
51-65	22	I can live from my monthly income, but can't save any.	25
66+	1	I can live from my monthly income.	12
<b>Highest education level, %</b>		I can make a living and can save a little-	43
Primary education	4	I have regular savings.	16
Secondary education without a school leaving certificate	4		
High school graduation	23		
Higher education with diploma	58		
Higher education without diploma	11		

*Table 2 The composition of the sample  
(own source)*

The ratio of the gender of the respondents is 69 % woman and 31% man, already with this data, the representativeness factor fails, since in the case of questionnaires distributed online, women are generally more willing to fill in questionnaires, which is also clear from the statistics I have made. In the case of age groups, it is much wider range of people that I could reach out to. Respondents aged 18-25 were 21%, 26-35 were 31%, 36-50 were 25% and 51-65 were 22%. Also there was 1% above 66.

Most of the respondents had some higher education with diploma with 58% and 23% of the respondents had high school graduation. There is a small rate of people with 11% who haven't got their diploma but went to higher education. The people with only primary school education and secondary education without school leaving certificate were only 4-4% each.



Respondents from villages were 45%, which is in my opinion good, because I expected this number to be more as I am from the countryside. It seems I could reach people in towns as well, because 27% are from the towns and 22% are from Budapest.

According to the results, 43% of the respondents said that they can make a living and also can save a little from their income. On the other hand, 25% said that they can make a living, but can't save any which indicates a significant number of people living month-to-month in Hungary. 12% of them just lives from their monthly income and 4% of them admitted that they can't live from their monthly income. Only 16% of the respondents have regular savings, which indicates that they save money above their monthly spendings.

### 3.1. Limitations of the research

The one-month interval for data collection proved insufficient to achieve a larger sample size, resulting in a total of only 131 completions. Looking at the composition of the survey, I can state that the survey is not representative and therefore the results cannot be generalised to the Hungarian population. Due to the composition of the Facebook groups chosen and my own circle of contacts, a higher proportion of women completed the questionnaire, and the results obtained from the responses are not sufficiently accurate in terms of the overall gender distribution of the population. There were some limitations in the snowball sampling procedure, as the rules of each social media group meant that the questionnaire could only be published once, so it did not reach a sufficient number of people.

## 4. The interviews with representatives of supermarkets in Hungary

### 4.1. Purpose and preparation of the interviews

For the first part, I interviewed Alex Laffan, an individual with extensive experience in the retail industry, particularly within the Tesco corporation. Alex has served within Tesco for over 11 years, holding various key positions that have given him valuable insights into the market. Currently, he holds the position of Director - Central Europe and Customer & Product at Tesco Business Services, a role he has held since February 2020. Prior to this, he had international experience, having worked in locations such as Bengaluru, Karnataka, India. Given his extensive background within Tesco and the retail sector, Alex's answers in the interview will provide invaluable and accurate insights into the market dynamics within the industry.

For the second part, I interviewed Attila Fodor, the Communication Director of CBA Hungarian Supermarket Chain, whose huge experience and media presence proves that he is accountable for insights into the industry. He has been over numerous interviews for national media channels, showcasing his accountability and expertise in providing transparent answers for questions related to retail. I decided to interview him because, through his interactions with the media, Attila brought a deep understanding of market trends, consumer behaviour and the retail sector. We discussed the challenges and the opportunities facing the supermarket industry in Hungary as well.

For the third part, I interviewed Árpád Varga, he is the Store and Area Manager at Metro Kereskedelmi Kft., a German wholesaler store famous for its significant range of products and services. Árpád has much experience in the retail sector, and gave answers to the questions with knowledge of overseeing store operations and strategic management within his designated area.

I cannot say that I only and exclusively learned new information about the life of the companies, or even about the difficulties caused by the Covid-19 epidemic. However, most of the participants were happy to talk and tell stories, and thus shared a lot of information with me that partly, if not completely, overwrote some of the assumptions of my thesis. During the conversation while the interviews were taking place, I saw beyond the economic information, the emotional background of the business. That if you put your heart and soul into it and want your business to succeed, you will literally do anything to make it happen. Sleepless nights,

difficult decisions, saving money and making improvements at the same time to keep your life's work even if it involves health risks during the epidemic season.

I split up the questions and the interview analysis to three parts: Covid-19 and its effects on retail, e-commerce, automation and innovation.

## 4.2. Content of the interview, key observations and results

### 4.2.1 Covid-19 and its effects on retail

"In the first round, when the epidemic started shops started to handle multiple times the turnover of the usual normal period," Árpád said, emphasizing the huge increase in demand and Attila agreed, noting that "panic buying started and the shops handled significantly increased turnover." Alex also confirmed that supermarket sales increased during the epidemic, stating that "in some ways, supermarkets benefited from COVID because people needed to buy food." Before I interviewed the participants, I haven't realized how much struggles they had to face to ensure the customers that there is enough stock from any product category. Disruptions in the supply chain became a problem that all of the participants faced. Árpád emphasized the shortages of hygienic items and durable food products followed by rising demand. According to Attila, "there were shortages of these durable food products in more and more places." Árpád emphasized the significance of Hungarian suppliers in ensuring ongoing supply and it was true for the CBA director as well. Attila also mentioned that it was kind of a competitive advantage to Tesco and Lidl as they both focused on their market at their home country. The shift to internet-based shopping became a trend between the customers through the pandemic period. According to Alex, who mentioned an increase in online sales, "online retail really grew during COVID." Attila also told me about a shift in consumer behavior from offline to online shopping, which required quick adaptations to meet the growing need for online sales channels from the customers. This shift emphasized how crucial it is to adjust to the ever changing customer behaviour. As both Árpád and Attila emphasized the need for strict policies to be implemented to protect both customers and employees in response to health and safety issues. They all told me about that they made similar efforts for suitable distance-keeping measures and disinfecting high-contact locations in businesses, Árpád stated that "extra measures had to be introduced, we disinfected the areas in the store that customers could touch several times a day." Attila and Alex agreed, stating that store employees were committed to keep supplies steady during those chaotic times. In summary of this part, although every participant had different challenges, they

all agreed on the sudden increase in demands that caused disturbances in the supply chain, transitions to e-commerce, and created the need of actions to provide health and safety protocols.

Árpád highlighted the importance of customer satisfaction which was resulted by several measures at Metro. „Being wholesalers we managed to execute strategic stockpiling and also in-store hygiene measures were applied.” This was also the same for Attila, who highlighted the significance of maintaining safety protocols and continuous supply chains to meet evolving consumer demands. On the other hand, Alex provided a wider perspective on shifting consumer behaviors, particularly in response to economic fluctuations. Alex mentioned that in the early stage safety concerns were the priority of the customers and they started bulk buying online, but then it shifted to price sensitiveness as food inflation hit a 40% level in Hungary, but also predicted that it might change in the near future: „, but you're seeing people have some I think a bit more money maybe in a bit more confidence”. According to Attila, "basic food products...began to be sold out to an unprecedented extent and this resulted a change in needs," highlighting the food panic buying, but he also expressed the high food prices after Covid-19. Interestingly, Attila also pointed out that while physical stores saw a decrease in the number of customers visiting the store but an increase in basket sizes, this resulted online platforms experiencing unique challenges.

At Metro they experienced rapid adoption of digital communication channels, noting, "the number of e-mails increased and the Metro app was rapidly developed." This response was needed regarding the shifting consumer preferences towards digital platforms. From Alex's point of view, the continuity of core value propositions across both online and offline channels were in the focus alongside with price competitiveness and loyalty programs. Alex noted, "the key to marketing is really around our price propositions and Clubcard," highlighting the consistency in connecting and communicating across online and offline platforms. However, he also said that there is need for more targeted marketing efforts. Attila emphasized the importance of promoting the continuity of food supply, that they had as they were having much more local food suppliers than their competitors, through various communication channels, including press statements and in-store messaging. "we tried to reassure the population that the supply of food products is continuous and uninterrupted," he said emphasizing the trust that customers gave them in those uncertain times.

In the context of Metro's response, Árpád detailed that digital solutions and redesigning the stores play a crucial part in meeting client expectations. He stated to me, "What

served to satisfy customers and helped efficient sales were only cash registers with credit cards, digital solutions, pallet displays." This statement emphasizes Metro's dedication to using technology and effective sales solutions to quickly adjust to changing conditions. Alex, on the other hand, told me insights into Tesco's pandemic strategy, emphasizing the company's quick reaction and relentless dedication to the welfare of its customers and employees. Alex said, "we can do stuff really really fast when we need to." With this statement he was praising the effectiveness Tesco had when the crisis hit. Furthermore, Alex highlighted Tesco's customer-centric culture, "There was never any attempt to kind of make extra profit," he explained me in details that the company's preference is to meet the demands of its customers and employees rather than trying to make some extra profit.

Attila provided information about CBA's flexible tactics and the already changed market conditions following the pandemic. He emphasized that the market has almost restructured back to the covid before period while acknowledging lot of difficulties they met during the crisis period. According to Attila, "After all, it should also be known that after the end of the coronavirus epidemic, a significant reorganization of the market has practically begun." While Alex emphasized Tesco's customer-centric decision-making and focus on their employees' well-being, Árpád highlighted Metro's dedication to adapt digital solutions and sales tactics and Attila provided information about the changing market dynamics seen after Covid-19.

#### 4.2.2 E-commerce

According to Alex, he shared with me the details regarding the organization's continuous investment in technology upgrades both in-store and online. He emphasized that Tesco is always focusing on improving the customer experience by improving the speed and efficiency of the online shopping process. Alex noted, "We constantly doing upgrades to various bits of technology both in store and online,". Furthermore, he provided insights into the relative significance of online sales within Tesco's revenue streams, stating, "online contributes about 3 or 4% of sales... in central Europe," and also mentioning that in the UK for instance this number is 10-12%. Alex also said that the profitability is a challenge associated with e-commerce, noting, "online is a less profitable part of the business than stores," due to the higher operational costs. On the other hand, Attila focused on the organization's response to the increased e-commerce demand, particularly in terms of expanding product offerings and payment options. He highlighted CBA has made all efforts to meet increased demand for essential products through their online platform, noting, "the demand for daily products... has

also increased significantly." he also emphasized CBA's commitment to improve their online shopping experience by offering a wider range of products and payment options to customers. Furthermore, he highlighted the organization's approach to handle logistical challenges, stating, "we have increased the number of colleagues in this area, as well as transport vehicles," highlighting CBA's investment in human resources and infrastructure to support e-commerce.

For the question where I asked about the challenges between maintaining the balance between online and offline, Alex answered that, „how are you growing online as a kind of sustainable part of your business so that's kind of improving the customer experience but also you know you're creating a profitable online business”. He explains the challenges they faced when the online sales became less profitable again. “ when people spend €15 or €20 on the basket it's much less profitable”. Attila simply just answered, „We sensed from the market that customers were diverted back to the offline platform.” and he meant that after Covid they reduced the spendings on improving their online side.

The data that Árpád shared with me regarding Metro's online sales performance provide insights to the company's growth. He stated, "Nearly 400 delivery units in Budapest and between 50 and 100 in rural stores handle online orders on average per day," highlighting the number of online transactions processed by Metro. Moreover, Árpád emphasized Metro's remarkable growth in online sales, revealing that it was for "40% of the total annual revenue last year" and is predicted to increase to "up to 70% this year" which is quite significant comparing to other chains. Regarding the average basket value for online purchases, Árpád told me it's "237,000 HUF gross," highlighting that the shopping basket is quite big as well.

Attila, on the other hand, said that their online share is just few percents, so their opportunities for online growth are also limited. He said, „In online sales, the basket values are typically higher”, but also mentioned that because of the convenience people buy cheap products with large mass, comparing to the covid times, where every product category was popular. „During covid, as I mentioned, cold meats, fruit and vegetables, and baked goods were also added to the lists. But in the current period, they have decreased significantly.”

#### 4.2.3 Automation and innovation

Árpád emphasized Metro's commitment on creating innovative solutions as he mentioned them to me, automated checkout processes and scan-and-go technologies to improve consumers' shopping experiences. "We are developing the automated checkout share, scan-and-go, where a scale checks the products entered into the system before payment in the cart," he

said, confirming Metro's aim to use automation to raise their efficiency and speed up the checkout procedures. Metro's efforts to improve its mobile app and web platform is serious, providing exclusive deals and information to meet the demands of both regular customers and traders in the retail business.

From Alex's point of view, we discussed Tesco's attempts with new automated checkout technologies, particularly the "get go" concept, which meant to speed up the in-store purchasing process. "If I have a club card and it's registered, they can walk straight in, do their shopping, and walk out" highlights Tesco's attempts to introduce new technology into physical retail locations in an effort to blur the lines between online and offline channels. Alex also talked about the difficulties in implementing these new ideas, like lot of customers who doesn't have club card, would prefer to pay at normal checkouts, so for this reason they created hybrid stores, which are half automated and half regular stores, although these projects seem promising, they are still in the early phases of development.

Attila gave me more details about the place that these checkouts have in the market: "Self-service checkouts have their place in the market, especially in stores where the number of customers is higher but the basket values are low," he said, stressing that CBA has a strategy for accommodating a range of consumer preferences and introducing automated checkouts. Attila also noted „We see that it is a slow process, but more and more people are open to it” which suggest a slow adaptation of these new technologies at the stores, which is important, because they received positive customer feedback after introducing these checkouts, but they had to take these steps proportionately without making explosive changes from one day to another.

I interviewed the participants regarding the future plans of automation. Arpad said „Digital inventory management, stock management and in-store logistics are now being developed, and electronic invoicing has been introduced for some business partners.”, which reveals the diverse improvements Metro has in order to keep up with the competition. He also said that they digitalise their quality records as well. In the case of Tesco, they have been leaders in the market regarding innovation: „ I love about Tesco is we have been quite often at the forefront of some of the innovations in retail” said Alex, and he also explained that they have various innovation teams through the world and they have a „red door” where anybody can come and introduce their innovation idea to Tesco, what they might consider to implement in their business. Their direction towards innovation is to reduce carbon footprint and automate technologies. Attila agreed with Alex on the fact that a lot of business come to CBA to introduce

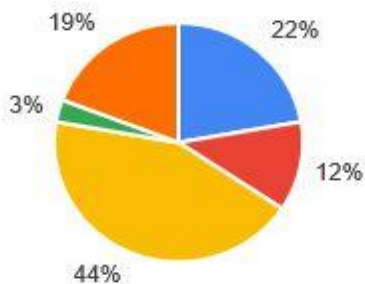
new solutions. „we also take Western European examples into account, when we make decisions regarding future development” said Attila, and he meant that they are constantly monitoring the possibilities for future development to improve the customer experience in the stores.

All things considered, Árpád, Alex, and Attila's interview answers emphasize that how crucial innovation and automation are. Even though, they approach innovation differently, they all aim to use technology to increase profitability, improve customer satisfaction, and maintain an advantage in a market.

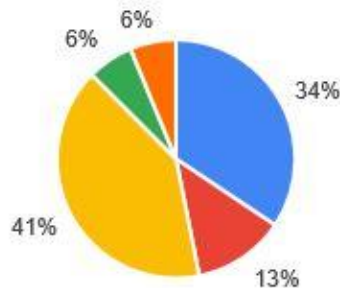
## 5. Survey regarding consumer habits in Hungary

### 5.1. Key findings of the survey

For the first question I asked the respondents whether they made more purchases online or traditionally in the last month, the majority of the respondents 85% said that they were shopping mostly traditionally in the last month, while 15% of them said that they tend to prefer online platforms still. Based on this statistics, customer behaviors appear to have significantly recovered after the COVID-19 pandemic. It was a tendency for people to shop more online during the pandemic to avoid contacts and maintain social distancing, but as the crisis ended and the government regulations started to disappear, a noticeable return can be seen to typical buying habits of customers before COVID-19. This result indicates that the popularity of digital food shopping didn't persist after the pandemic, potentially replacing physical shopping in our lives, which answers one of the research questions.



- I can live from my monthly income, but I can't save any.
- I can live from my monthly income.
- I can make a living and I can save a little.
- I can't live from my monthly income.
- I have regular savings.



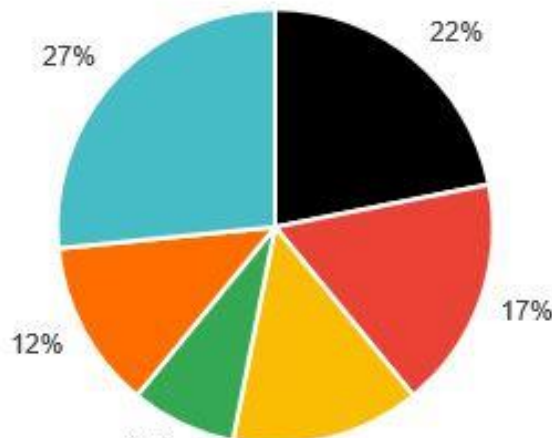
- I can live from my monthly income, but I can't save any.
- I can live from my monthly income.
- I can make a living and I can save a little.
- I can't live from my monthly income.
- I have regular savings.



*Figure 4 People who bought online food never, once a month or less then a month(own source)*

*Figure 5 People who bought online 2-3 times a month, 2-3 times a week, once a week or daily (own source)*

For the second question, I made a comparison between people who bought online rarely and people who bought online more often. Among the respondents who mostly bought online, 34% of them can live from their monthly income but can't save any, while it's 22% of the people who rarely bought online. It is interesting that only 6% of mostly online shoppers reported having regular savings, suggesting that a relatively small percentage of this group actively saves money, while a higher percentage (19%) of rarely online shoppers reported having regular savings. Also 3% of them said that they can't live from their monthly income but they still bought online regularly. Based on these result, people who have more money don't tend to spend it online, while people having less money tend to shop online more. The majority of both (41% and 44%) groups can live from their income and even save a little, indicating a moderate level of financial stability among them.



*Figure 6 Customer preferences of online shops (including only people who have bought food online) (own source)*

According to the answers for question related to the customer preferences of online shops, 51.1% of the respondents didn't buy groceries online, which indicates a huge potential for the future growth of this number. At this point, I have mention that there might be errors or controversial answers from the respondents in the survey results. For the previous question

50.4% of the respondents said that they never buy online, but for this question 51.1% of the respondents said that they didn't shop online. This indicates that different results can be expected for similar questions, because of the respondents' fault. Those who bought groceries online preferred to use online platforms in the „Other” category (27%) which means that the smaller online grocery stores' popularity is growing. Kifli.hu, a well-known online grocery store in Hungary, had a notable share of respondents' preferences with its wide range of grocery products and delivery services. Tesco and Auchan maintain their presence in the online grocery market, having moderate shares of respondents' preferences (12% and 8%), but they are facing competition from Foodora (22%) and Wolt (17%), therefore they have to focus on improving their convenient mobile apps, because Foodora and Wolt offers a different customer experience.



Figure 7 Changes between online and offline shopping preferences (own source)



Figure 8 Changes in shopping frequencies after Covid-19 (own source)

After investigating their favourite retailers, I wanted to find out how their behaviour changed after the Covid-19. For the questions related to the changes online-offline shopping preferences and in the frequency of their shopping, the respondents answered that mostly their habits didn't change.. As I mentioned in my secondary research changes in the food industry, my sample is not representative, because a lot of customers moved back to their pre-covid shopping habits, so their overall preferences didn't change. Still, a small change appears to be from the pre-covid preferences, 11% of the respondents said that they do more shopping both online and in person which indicates a growth in shopping frequency and 5% of the respondents for the other question said that they completely switched to online shopping, which also leaves space for growth in the online market.

To find out their delivery method preferences, I found it crucial after exploring their changes after Covid-19. I compared their method preferences to their type of municipality in order to prove that pick-up points are mostly popular in towns and home delivery has more significance at the villages. Despite having improvements on pick-up points and store pick-up solutions, home delivery remains the most popular delivery method in Hungary. Especially in villages it is the most common because from those who are from the villages, 76% of the people said that they prefer home delivery. Also the store pick-up options and pick-up points appear to have a small popularity as well. In towns and in Budapest home delivery is the most preferred method with , but respondents from towns and Budapest together answered they prefer pick-up points, although this percentage was only 28 %, probably because of their wider availability in the towns and Budapest.

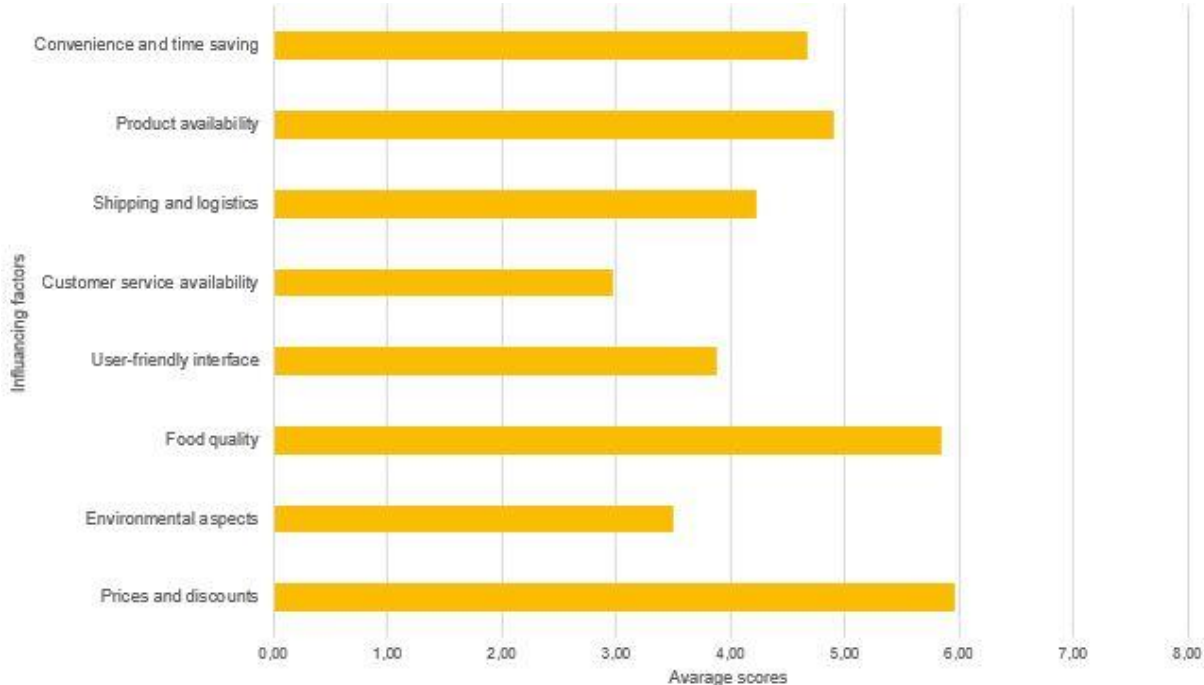


Figure 9 Average of the received scores for each category (own source)

I started to explore the factors which influence the customer decision making when shopping online, after I finished the delivery method part. The respondents had to select a number from a scale 1-8 how these aspects impact their decision making. Score 1 was that it doesn't impact at all, score 8 was it really impacts. The majority of the respondents said that their online buying decision is mostly influenced by prices and discount with an average score of 5.97 also food quality with an average score of 5.85. Product availability remains to be important for them, but environmental aspects with a score of 3.5 and customer service

availability with a score of 2.98 appears to be the least important for them. These results suggest that online stores should stay focusing on the quality and price proposition.

I also went further, when I asked the participants regarding their willingness to look for special dietary products online. 24% of them answered only that they never look for these special products online. The majority responded with a less than once month frequency, 44% of the respondents, from these responses 34% of them were aged between 26-35. 31% of the answers said that they look for these at least once a month or more and 27% of the were aged between 51-65 which indicates that every age group has the need to look for products that they can only find online.

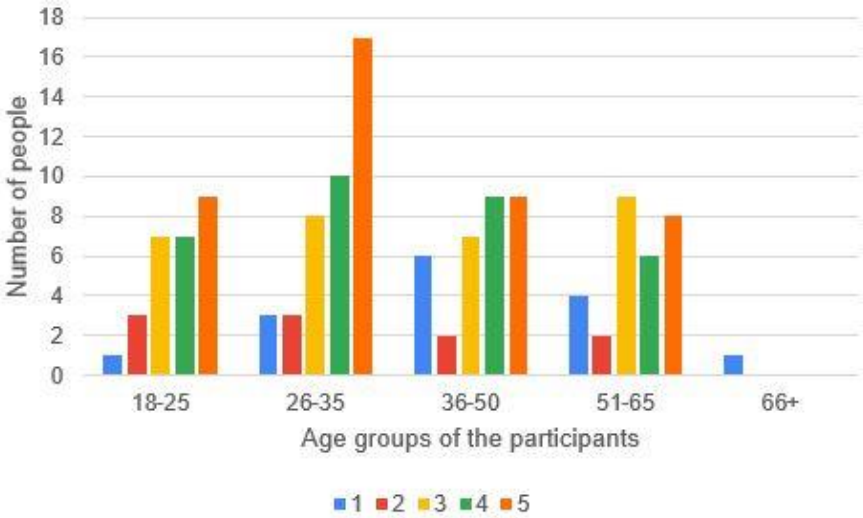


Figure 10 Customers' assessments on how likely it is that they will refer retailers with both online and offline channels by age groups (own source)

As one of my research question is related, I made a diagram for representing customers' assessments on how likely it is that they will refer retailers with both online and offline channels by their age groups. In this diagram I analyzed the relationship between age groups and the willingness to refer retailers with both online and offline channels. I assumed that as the age rises the responses with a score 1 would increase, and as the age decreases the score 5 would be given more. According to the diagram, most of the people feel positively about referring a retailer who offers both online and offline channels, also in the age group 26-35 people were outstandingly open to this: 41% of the them gave a score 5. The rising score 1 in the elderly age groups indicates that it is not a buying decision factor for them if the retailer offers both channels. For instance, 7% of the age group 26-35 gave a score 1 and it is 18% in the age group 36-50.

To stay at the the topic, I asked the respondents about how important they think the use of digital technologies in businesses. I wanted to find out if there is relationship between customer satisfaction and the use of digital technologies. Only 7% of the respondents gave the lowest score (1), according to them the use of self-service kiosks and smart shopping carts made the general shopping experience worse. On the other hand, 25% of them gave the highest score (5) and proved that the use of these technologies do have an impact on general shopping experience. It is clear that in the young generation the customer satisfaction is increasing as more digital technologies are integrated at the retailer. In the age group of 26-35 customers are more neutral to the digital technologies, but still there is a significant number of score 4 and 5 responses as well. Surprisingly, in the age group 51-65, 41% of respondents gave a score of 4 which indicates that the use of digital technologies is good for their general shopping experience.

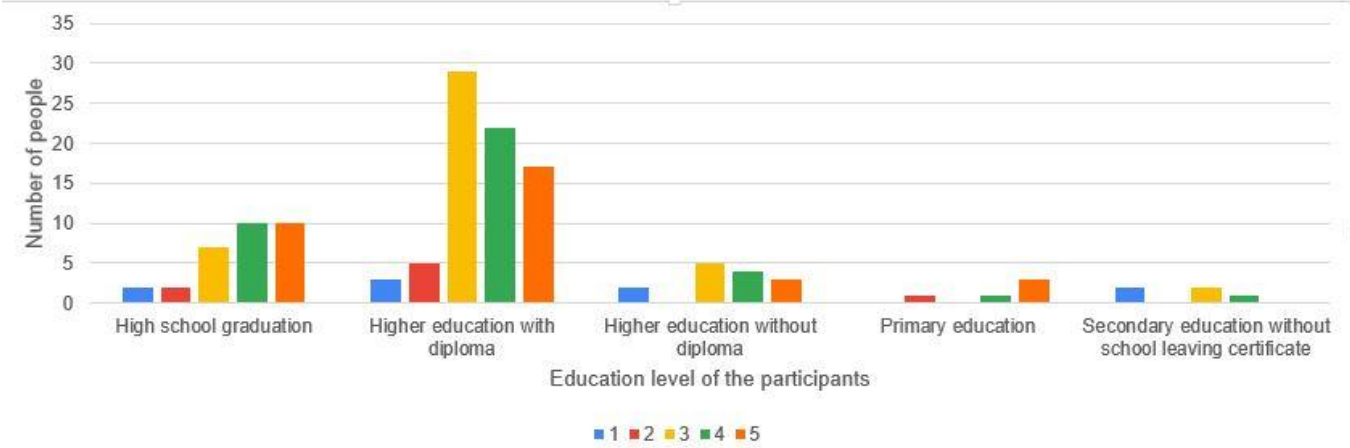


Figure 11 Customers' assessments on how important they think the use of digital technologies regarding the general shopping experience by education level (own source)

The relationship between the use of digital technologies importance and education level was initially hypothesized as the education level increases the customer satisfaction with the use of digital technologies will increase as well. Partly it is true, because most of the people gave score 3, 4 or 5 and there is a tendency in growing by the education groups, but there are not enough answers in each category to be this diagram representative. Most of the people have high school graduation or higher education with diploma, 32 respondents gave a score of 4 and 27 respondents gave a score of 5 from these two groups together.

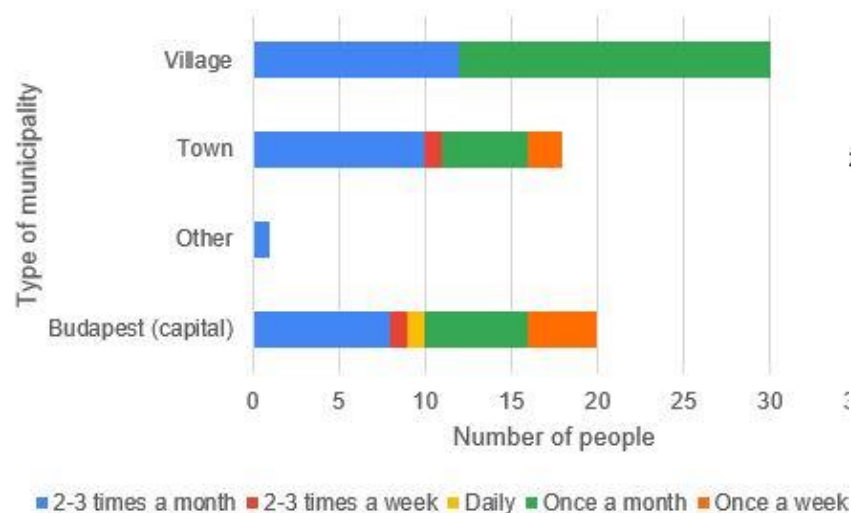


Figure 12 Customers' online shopping frequency by habitation (own source)

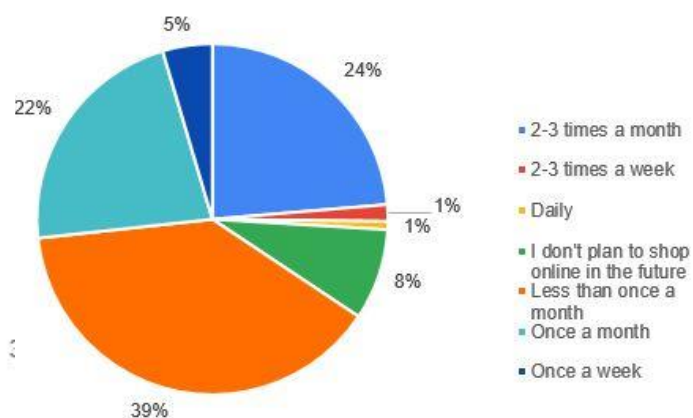


Figure 13 Customers' online shopping frequency (own source)

For the question regarding online shopping frequency, I intended to find out how often people will shop in the future, potentially finding out how e-commerce will be welcomed in the future. People who will shop online less than once a month were 39% and 8% who won't shop at all. The rest 53% is considered to shop online in the future regularly, but from this 53%, 22% is just people who will shop only once a month. The habitational diagram represents only this 53% who shop more. Respondents from towns were 29% and from the capital city 33%, but from the villages there 49% of the respondents as well. From the villages people will mostly buy once a month, on the other hand from the towns and the capital people will shop more regularly. This also proves that e-commerce is more popular in the towns than in the villages.

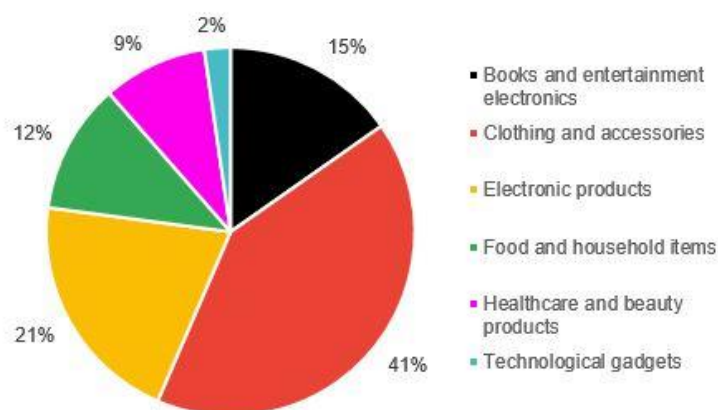


Figure 14 Customer preferences of products when shopping online (own source)

After determining how often people will shop, I was interested in their product preferences. The survey data reveals that clothing and accessories are the most popular products among the respondents with 41%, followed by electronic products with 21% and books/entertainment electronics with 15%, indicating a strong demand for fashion, technology, and entertainment-related items when shopping online. There has been a decrease in the popularity of food and household items (12%), while they still maintain a significant share of the preferences compared to pre-COVID-19 levels, suggesting a return to traditional shopping habits for their grocery needs. Healthcare and beauty products, along with technological gadgets are not popular among consumers in online shopping significantly, but for this the reason also can be that when buying these products the in-store experience is important for the customers.

## 6. Analysis of the interview and survey results and conclusion

### 6.1. Conclusions

Summarising the results of the primary and secondary research, it can be said that consumer habits have changed significantly as a result of the coronavirus epidemic, but these changes appeared to be not sustainable, although there is a good tendency that more and more people will be open to shop online. In the first part of the literature review, I looked at the consequences of the emergence of the coronavirus epidemic on the e-commerce market. I also analysed relevant research on not only the rise of e-commerce but also the difficulties encountered. The coronavirus epidemic has undoubtedly shaken both the economy and society, but it also represents a new revolution in development for e-commerce. In the second section of it, I was able to collect data on the current trends digital technologies and automated commerce. The new emerging technologies have a huge potential in the future of retail and those, who implement it in their business in the early stage and step by step, can expect a potential growth. In the third part, I discovered the trends and consumer preferences and how customer decision process works. I also mentioned the six types of risks perceived by consumers, which proved to be useful when analyzing the survey results: one of the perceived risk is inappropriate price and quality which was in line with the customer preferences impacting their decisions. The most remarkable and unexpected change is in consumer product preferences, both according to the secondary research and the responses of respondents, to which market players have had to react quickly. According to the interviews, people started buying food online during Covid-19, products like cold meats, fruit and vegetables, and baked goods during the pandemic, but they returned to their normal shopping habits. The survey proves this as well, the most common products that people prefer to shop online are the clothing

and electronics and the popularity of food category went back to 11.5%. The majority of people have shifted to online shopping platforms due to restrictions or convenience and security.

Although the resolution of the problems caused by the epidemic has gone relatively smoothly, it is worth starting now to identify areas for improvement. I believe that one of the most important aspects for e-commerce operators is to keep the technology they use up to date, so that they can keep up with changing consumer needs much more easily and quickly if they have the technical background to support their online store. Another area, which is also responsible for the ability to react quickly, is logistics, which should be an even higher priority for online shops in the future. Webshops that so far only have their own courier service or pick-up point should consider diversifying their delivery solutions and use the services of large courier companies, so that delivery to the customer is guaranteed even with increased demand. The primary research also included that Tesco could react to changes really quickly including their logistics and CBA considered to use the services of larger courier companies this way offering the expected or better customer experience and leaving space to focus on different areas at the company. One of the big lessons of the epidemic is the importance of continuously measuring the user-friendly aspects of an online shop and improving it according to the high level of user experience it can deliver.

In my opinion, I slight increase is expected in online shopping, but according to the survey results, only 16% of the respondents said that they have regular savings. They also said that prices and discounts are serious factors impacting their buying decision. 59.54% of the respondents gave a score 7 or 8 regarding the question on the most influencing factors during their decision making on shopping food online. This leads to the understanding that most of the Hungarians have moderate income leveles, therefore price and discounts impact their decision making mostly. Until these two factors change, there is a serious limitation in the growth rate in online shopping. The interview gave insights in the decision making processes in major supermarket chains in Hungary. When the popularity of online food shopping and the shopping baskets increased, the companies reacted to this with quick investments in their online channels for instance, buying new delivery vans and widening the range of products offered online. Both the interview and the survey proves that this peak in increased demand returned to the pre-covid levels almost. In consequence, the companies started to lower their budget on the improvements of their online channels. These data suggest that online purchasing will just slowly increase, and that customer preferences won't change unless similar crisis happens.



According to the interview results, the integration of digital technologies and digitalization blurred the boundary between offline and online retail channels. Both Tesco's and Metro's response proved that introducing new technologies in the physical stores had an impact on both channels, but also they emphasized that it is a slow process, because they have to take in consideration the customer willingness towards adaptation to these new technologies. In the survey, the majority (87%) of the respondents said that introducing digital technologies increases the general shopping experience, therefore the overall customer experience. Based on these results, customers are open to new solutions and it also impacts their customer satisfaction as well as they would start to come to those stores more often which offer them these unique experiences. The insights from the interviews with Árpád, Alex, and Attila resulted the understanding of the significance of automation and innovation in shaping the retail landscape, particularly in the context of Metro, Tesco, and CBA. Metro puts a strong emphasis on the commitment to innovative solutions such as automated checkout processes and scan-and-go technologies. The company aims to improve their efficiency and make their checkout procedures more convenient, while they also invest in the improvement of mobile app and the web platform to serve the needs of the customers and traders alike. Tesco highlighted their „get go” concept, which is currently only operating in the UK. As I previously mentioned, their efforts are to improve in-store purchasing processes and bridge the gap between online and offline channels. Although there have been implementation issues, such as customer preferences regarding traditional checkout procedures, Tesco is still dedicated to seek innovative approaches to improve the whole shopping experience. Alex told me an excellent example of Tesco's flexible approach to innovation, the creation of hybrid stores, which combine automated and conventional checkout choices. According to Attila, the implementation of solutions regarding automation went successfully at CBA, but slowly and only at the stores which had a lot of customers with a low shopping basket value. He also said that using automated technologies are becoming more and more important at the retailers. At Metro they intend to improve their digital inventory management and their in-store logistics, while at CBA they will keep monitoring global trends and will adopt the best practises. Tesco's future approach to innovation is represented by their „red door”, which is always open for both individuals and companies to introduce their new technology and this way Tesco is not just able to keep up with the competition, but get ahead of them by introducing a new digital solution first.

## 6.2. Suggestions for future research

An unexplored area in e-commerce is observing the impacts of chatbot interaction with customers on these retail platforms. They serve as virtual assistants to guide the users through their shopping experience, but there is still much to be understood about if these chatbots have an impact on consumer behaviour. The following questions could be asked in these researches:

How do consumers perceive and respond to interactions with chatbots during their online shopping journey?

Do these interactions evoke feelings of trust, satisfaction, or frustration?

What ethical considerations may appear after the deployment of chatbots in e-commerce, particularly concerning issues of privacy and data security?

These questions leaves space for future studies and with their help retailers would get a clear picture on how effective is using chatbots in their business.

## 7. Summary

The main objective of my thesis was to provide a comprehensive picture of the ongoing transformation of e-commerce and to describe the changes in consumer behaviour in response to the coronavirus outbreak. I feel that I have been able to present in detail the factors surrounding the phenomenon. In the introduction I expressed my objectives in this research and highlighted the significance of it. I also introduced my research questions.

In the literature review part, I covered three main topics: coronavirus and its impact on retail, automated commerce and also I discovered trends and consumer preferences. Some of the key Covid-19 datas were presented by the world and by Hungary as well. I highlighted the potential that digital technologies have in reshaping the future.

In the research methodology part, I mentioned the reason why I need to do both qualitative and quantitative research and I discussed the topics covered with the interviewed directors. I addressed my survey and that the data is collected with snowball sampling method. I analyzed the background variable results from the survey and in short I mentioned the limitations of the research as the survey is not representative and can't be generalized to Hungary.

In the interview part, I highlighted that the people I asked professionals in retail and I also split the discussion about results part into three topics: Covid-19 and its effects on retail, E-commerce, Automation and innovation. I have learnt a lot from the participants, they all expressed the difficulties they had to face during the pandemic and what conclusions they have after it. They agreed that the use of digital technologies are important in their companies and also expressed how the integration of digital solutions in their offline and online channels increased customer satisfaction and loyalty. The director of Tesco said their club card promotion focusing on low prices for their loyal customers is a huge success and also how they plan to integrate automated technologies in their business.

In the survey part, I covered 10 questions and their results. I analyzed them one by one to give a clear picture of these results for instance, I found that people returned to their normal pre-covid shopping habits and this result is in line with the interview answers as well. The respondents mostly agreed on that the use of digital technologies increases their customer satisfaction. The survey results also suggests that the retailers should focus on the group of people who will plan to shop less than once a month in the future (39% of the respondents), because they already have the willingness to shop online, but they need more motivation, like discounts - special offers offered from the retailers.

I have covered several aspects of the consumer preferences of the respondents in the conclusion section. I compared the results from the primary and the secondary research and I also made predictions for the future growth of e-commerce. I also suggested that retailers should consider diversifying their delivery solutions and use the services of large courier companies following the example of CBA to adapt to the changing online shopping habits of the people, but still offering them the general shopping experience.

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