XIV. Customer Perception of Technologies for New-Generation Web Shops – Preliminary Study

Tamara Križnjak, Simona Sternad Zabukovšek, Samo Bobek
University of Maribor, Faculty of Economics and Business, Maribor, Slovenia
tamara.kriznjak@student.si, simona.sternad@um.si, samo.bobek@um.si

This paper investigates emerging technological trends in web commerce and examines user perceptions through a pilot survey. Key innovations include IoT, AI, ML, chatbots, social and voice commerce, as well as immersive technologies like AR and VR. These tools enhance personalization, automate services, and support better consumer decision-making. The pilot study, based on an online questionnaire, explores user behaviour, expectations, and attitudes toward these developments. Results show that while users are familiar with technologies like chatbots and personalization, awareness of AR and VR remains low. Concerns about security and data privacy significantly influence user trust. The findings highlight the need for seamless technological integration, increased user education, and transparent communication to build trust and improve the digital shopping experience.

DOI
https://doi.org/10.18690/um.epf.7.2025.14

ISBN
978-961-299-010-7

Keywords:
web commerce, e-commerce trends, internet of things (IoT), artificial intelligence (AI), machine learning (ML), chatbots, augmented reality (AR), virtual reality (VR), voice commerce, user perception, digital transformation, data privacy

University of Maribor Press

1 Introduction

The advent of the internet has enabled the rise of e-commerce, introducing transformative changes to global goods circulation. Online commerce has broken down time and space constraints, reshaped commercial patterns, and accelerated the flow of goods, capital, and information. These developments have led to increased productivity, enhanced economic efficiency, and lower transaction costs. Moreover, e-commerce has influenced consumer lifestyles and social behaviour, contributing to a shift in how people perceive and interact with the world. Current and emerging trends in online commerce continue to drive innovation and improvement. By leveraging technologies to collect and analyse customer data, e-commerce platforms can now tailor marketing strategies and customize product offerings more effectively.

In recent years, e-commerce has become an integral component of global retail. Like in many other industries, the Internet has fundamentally reshaped the buying and selling of goods. As digitalization continues to penetrate all areas of modern life, consumers across the globe benefit from the convenience and accessibility of online transactions. With the rapid expansion of internet access and usage worldwide, the volume of online purchases continues to rise (Pasquali, 2023). Today, a consumer's first point of contact with a company often occurs online. In Slovenia, for instance, 1,562,370 individuals aged 16 to 74 used the Internet in 2022, representing 74% of the total population (Statistical Office of the Republic of Slovenia, 2023). In the global e-commerce revenue rankings, Slovenia holds the 90th position, with projected earnings of USD 927.9 million for 2023 (ECDB, 2023).

As consumers are presented with an ever-increasing variety of choices, making purchasing decisions has become more complex. Consequently, the influence of emerging information technology trends and developments in online commerce has become more pronounced. These digital trends make it easier and faster to guide consumers toward purchase decisions, thereby reshaping the dynamics of digital consumer behaviour.

2 Web commerce

Electronic commerce (e-commerce), a product of the internet, is one of the most transformative technological and societal advancements of the modern era. It has revolutionized global trade by eliminating the traditional barriers of time and space, reshaping commercial patterns, and significantly improving the flow of goods, capital, and information. E-commerce enables businesses to gain competitive advantages by streamlining operations and reducing production and transaction costs. In essence, it empowers traditional businesses to operate faster, more efficiently, and more cost-effectively (Zheng, 2010).

The influence of online commerce extends far beyond retail. It influences key aspects of society, including employment, industrial production, legal frameworks, education, and public administration. Moreover, it permeates virtually all sectors, including manufacturing, logistics, finance, media, government services, research institutions, and even traditional agriculture (Zheng, 2010).

At its core, e-commerce can be succinctly defined as: "the buying and selling of goods or services over the Internet." These transactions occur electronically, without physical interaction between the buyer and the seller.

The increasing demand for convenience, speed, and privacy is among the primary factors driving consumers toward e-commerce. Technological advancements, particularly in information and communication technologies (ICT), have further reinforced this trend. Additionally, globalization has intensified market competition and heightened consumer expectations, accelerating innovation and adoption in e-commerce. A key driver of this transformation is the widespread availability of mobile internet access through smartphones and tablets. These devices enable consumers to compare prices, read product reviews, and access information instantaneously. Increasingly, shoppers visit physical stores merely to inspect products in person, only to finalize their purchases online where better deals are often available (Santos et al., 2017).

E-commerce platforms serve as the technological backbone of online stores. They facilitate essential functions such as catalogue management, order processing, payment integration, customer support, and logistics coordination. Platforms such

as Magento, WooCommerce, Shopify, PrestaShop, and BigCommerce provide comprehensive toolsets that support the efficient management of digital retail environments and enable scalability.

Marketing tools are crucial to the success of e-commerce ventures. As multi-channel strategies become more prevalent, digital marketing in e-commerce has evolved into a complex, data-driven discipline. To maintain competitiveness, businesses must manage diverse sales and communication channels—including social media, email, search engines, and influencer networks—with precision and consistency. Modern marketing tools facilitate automation, real-time analytics, personalization, and targeted advertising, ultimately enhancing campaign effectiveness, customer engagement, and conversion rates.

Looking ahead, e-commerce is set to undergo significant transformation. Its future will be increasingly digital, consumer-centric, and sustainability-oriented. Artificial intelligence (AI) is expected to play a critical role, particularly in areas such as personalization, product recommendations, inventory management, and customer service. By analysing large volumes of user data through machine learning, businesses can deliver tailored experiences that enhance customer satisfaction while improving operational efficiency. This not only increases revenue potential but also optimises resource utilization.

E-commerce businesses that recognize and proactively adapt to these emerging trends will be better positioned for success in an increasingly competitive digital marketplace. The following section will explore key trends shaping the future of online commerce.

3 New developments in web commerce

3.1 Internet of Things (IoT)

The Internet of Things (IoT) refers to billions of physical devices around the world that are connected to the internet, collecting and sharing data (Ranger, 2020). In recent years, IoT has become one of the most transformative technologies of the 21st century. Everyday objects—such as kitchen appliances, cars, thermostats, and

baby monitors–can now be embedded with smart technology, enabling seamless communication between people, systems, and things.

By leveraging low-cost computing, cloud infrastructure, big data, analytics, and mobile technologies, physical devices can collect and transmit data with minimal human intervention. The widespread availability of affordable microchips and wireless networks has facilitated the transformation of virtually any object—from small tablets to large aircraft–into a component of the IoT ecosystem. By equipping these objects with sensors and connectivity features they gain a degree of digital intelligence, allowing them to communicate real-time data autonomously. In doing so, IoT bridges the physical and digital worlds, making them more intelligent, efficient, and responsive (Ranger, 2020).

The increasing integration of IoT in e-commerce has significantly altered how both consumers and retailers interact and conduct transactions. Online stores can now send personalized promotions and recommendations based on a customer's location, preferences, or purchasing history–enabled by data collected from smart devices such as smartphones, fitness bands, and smartwatches. Additionally, smart home devices (e.g., thermostats, smart refrigerators, lighting systems, and speakers) contribute to the e-commerce ecosystem by enabling automated replenishment of household goods.

From a business perspective, IoT enhances operations by improving supply chain visibility and enabling real-time order tracking via smart devices. This integration of IoT not only optimizes but also elevates the overall user experience and operational efficiency, changing the way e-commerce functions.

According to Koteshov (2024), the most prominent applications of IoT in online commerce include:

- Eliminating logistical bottlenecks
- Enhancing user experience
- Inventory management
- Troubleshooting and failure detection
- Improving security
- Performance analytics

Eliminating logistical bottlenecks. IoT plays a crucial role in addressing inefficiencies throughout the supply chain. Businesses can monitor, automate, and optimize logistics through connected sensors and tracking devices. Technologies such as autonomous delivery vehicles, automated warehouses, and smart packaging solutions are driven by IoT. Real-time tracking and predictive analytics enable companies to forecast demand more accurately, streamline inventory levels, and minimize costs associated with overstocking or understocking.

Enhancing user experience (UX). IoT facilitates the personalization of the customer journey by collecting behavioural data from connected devices. These insights allow businesses to deliver tailored recommendations, dynamic content, and targeted advertising while refining their service offerings. For example, if IoT sensors detect a product malfunction, the system can automatically notify the customer and initiate a service request, thereby enhancing user satisfaction and retention.

Inventory management. Through IoT-enabled sensors and Radio Frequency Identification (RFID) technology, retailers can monitor inventory in real-time. Inventory databases are automatically updated when items are shipped, received, or sold. This automation supports efficient restocking and ensures better synchronization between e-commerce platforms and supply chain networks. Additionally, direct integration with suppliers enables a more responsive and transparent supply chain, ultimately improving delivery accuracy and fulfilment speed.

Troubleshooting and Problem Detection. IoT facilitates the proactive identification and resolution of common e-commerce, including lost shipments, cart abandonment, high return rates, and low customer engagement. By analysing behavioural patterns and device-generated data, businesses can address potential issues before they escalate, improving customer satisfaction and operational performance.

Improved Security. IoT contributes to enhanced e-commerce security for both retailers and consumers. Smart surveillance systems, motion sensors and access control mechanisms can detect unauthorized activity, security breaches or theft in warehouses and fulfilment centres, allowing businesses to take immediate action.

Performance Analytics. Monitoring key metrics such as goods movement, delivery times, customer location data, and usage patterns provides businesses with valuable performance insights. IoT-generated data helps determine whether key performance indicators (KPIs) are being met and identify areas for improvement or strategic intervention.

In summary, IoT is not only reshaping the technological infrastructure of online commerce but also offering new levels of intelligence, automation, and personalization that benefit businesses and consumers alike.

3.2 Artificial intelligence and machine learning

Artificial Intelligence (AI) has attracted significant attention for decades, yet it remains one of the most transformative emerging technologies. Its full impact on how we live, work, and interact is only beginning to unfold. AI is already recognized for its remarkable capabilities in image and speech recognition, and it is widely used in navigation systems, virtual assistants on smartphones, ride-sharing services, and many other applications (Duggal, 2023).

Recently, AI and its subfield, Machine Learning (ML), have become central to innovation in information technology. Many leading companies implement AI and ML solutions to enhance user experience, streamline operations, reduce production issues, and increase revenue (Sakovich, 2023).

In e-commerce, machine learning plays a key role in utilizing self-learning algorithms to forecast sales trends, optimize marketing strategies, manage inventory and delivery, personalize the shopping experience, and mitigate retail risks (Vekony, 2023).

According to Davidov (2022), ML significantly impacts e-commerce through the following areas:

– Product Recommendations. Machine learning powers advanced recommendation engines by analysing past customer behaviour and interactions on the website. It suggests relevant products likely to interest each user,

increasing conversion rates and average cart values. For instance, eBay displays laptops to users who previously browsed similar items.

- Personalization. E-commerce platforms can use ML to tailor the entire shopping experience. This includes customising product displays, special offers, messages, and recommendations based on individual customer interests and purchasing history. (Further explored in Section 3.5.)
- Customer Behaviour Monitoring and Analytics. ML enables tracking and analysis of customer behaviour on e-commerce sites. By understanding browsing patterns, navigation flows, and abandonment points, businesses can make data-driven improvements to the user experience.
- Inventory Management. Machine learning is used to forecast product demand, enabling better inventory planning. Retailers can determine how many products to order or produce to meet customer needs while avoiding overstocking or stockouts.
- Fraud Detection. ML algorithms analyze transaction data and detect unusual or suspicious activities, helping to prevent fraudulent behaviour such as identity theft or credit card misuse.
- Advanced Identity Verification. AI technologies can support robust user authentication through biometric data, facial recognition, voice recognition, and other tools, ensuring that legitimate users carry out transactions.
- Dynamic Pricing. Machine learning enables e-commerce businesses to adjust prices dynamically based on demand, competition, seasonality, and other variables. This approach allows real-time pricing strategies that attract more customers and boost profitability while maintaining competitiveness.
- Content and Ad Customization. AI can analyse user behaviour across websites, social media, and other platforms to tailor content and advertisements more effectively to specific audience segments.
- Product Distribution Optimization. ML supports logistics and distribution optimisation by analysing delivery history to recommend the most effective shipping methods (e.g., free shipping or same-day delivery). It can also improve route planning by factoring in real-time traffic, weather conditions, and driver capacity.
- Demand Forecasting. AI and ML can develop predictive models to estimate future demand for specific products or categories by analysing historical sales

data and external influences. These insights help in planning inventory levels, marketing campaigns, and operational decisions.

– Website and Conversion Optimization. AI and ML can analyze user experience data—such as page load times, navigation flow, and responsiveness—and suggest improvements to boost conversions and reduce cart abandonment rates.

3.3 Chatbots

Chatbots, defined as "web-based conversational systems between humans and computers using natural language" (Cahn, 2017), have become essential in modern e-commerce. These intelligent software agents simulate human conversation and serve as digital assistants, guiding users through various stages of their online shopping journey. In recent years, chatbots have become a key component of modern e-commerce platforms, offering businesses an efficient, scalable way to enhance customer interaction, automate services, and streamline operations.

A key advantage of chatbots in e-commerce is their 24/7 availability, offering instant assistance regardless of time zones. They handle a wide range of inquiries, from answering product-related questions and processing orders to offering support on payment and shipping. This instant availability not only improves customer satisfaction but also reduces the workload of human support agents, allowing businesses to allocate resources more strategically.

Beyond basic customer service, chatbots serve as powerful tools for collecting and analysing valuable customer data. When a visitor lands on an e-commerce website, a chatbot can proactively start a conversation, asking questions about the shopper's preferences, product interests, or preferred communication channels. This interaction generates rich data that companies can use to personalize marketing campaigns, suggest relevant products, and optimize user experiences. Personalized recommendations based on chatbot interactions often lead to increased conversion rates and stronger customer loyalty (Bhargava, 2023).

A significant challenge in e-commerce is the issue of abandoned shopping carts. Many users add products to their cart but leave the site before completing the purchase, resulting in lost sales. Chatbots can address this issue in several proactive ways. For example, if a customer lingers too long on a checkout page, a chatbot can

initiate a supportive message, helping or even a small incentive to complete the transaction. These timely interventions often resolve customer concerns or hesitation in the moment. Additionally, if a customer exits the site without completing the purchase, a chatbot integrated with messaging apps or social media platforms can follow up with reminders or exclusive offers. These interactions not only help recover abandoned carts but also provide insights into the reasons behind cart abandonment (Bhargava, 2023).

Another noteworthy advantage of chatbots is their capacity to support multilingual communication. By using natural language processing (NLP) technologies, chatbots can understand and respond in various languages, making them particularly useful for international e-commerce operations. This linguistic flexibility broadens the company's reach and improves customer service for diverse user groups.

Moreover, chatbots are increasingly integrated with AI and machine learning capabilities, allowing them to learn from past interactions and continuously improve their responses. Over time, they become better at understanding customer intent, identifying patterns, and offering more precise support. This adaptability contributes to long-term customer engagement and helps businesses remain competitive in a fast-evolving digital marketplace.

In conclusion, chatbots represent a transformative force in e-commerce. Their ability to personalize the shopping experience, reduce cart abandonment, gather actionable insights, and provide round-the-clock assistance makes them an asset for online retailers. As AI evolves, chatbots are expected to become even more sophisticated, further enhancing their role in shaping the future of digital commerce.

3.4 Web commerce on social media

Today, social media platforms rank among the most powerful digital communication tools, exerting far-reaching influence on the global economy—especially the digital economy. In the modern digital age, simply establishing an online store is no longer sufficient to guarantee success. Businesses must go beyond transactional interactions and actively engage customers, nurture relationships, and cultivate digital communities. This shift has spurred the rapid emergence of social commerce, a

growing subfield of e-commerce that blends social media platforms and digital content into the buying and selling process.

Unlike traditional e-commerce, which typically relies on direct website-based transactions, social commerce integrates commercial activity directly into the fabric of social media interactions. This includes features such as customer reviews and ratings, peer recommendations and referrals, shoppable posts, influencer endorsements, livestream shopping events, and online communities built around shared interests (Linda, 2010; LaFleur, 2023). These elements create a more interactive and participatory shopping experience, where consumer behaviour is shaped by trust, engagement, and real-time social interaction.

The rise of social commerce has been fuelled by both technological advancements and evolving consumer behaviour. Chief among these factors is the widespread adoption of smartphones and the ever-increasing popularity of social networks such as Facebook, YouTube, TikTok and Instagram. These platforms have evolved far beyond their original purpose of personal communication and entertainment. Today, they function as hybrid environments where users can discover products, engage with brands, and complete purchases—all without leaving the app.

According to a McKinsey report, global sales through social commerce channels reached approximately $37 billion in 2021 and are projected to nearly double to $80 billion by 2025. This exponential rise is driven by growing consumer demand and continuous platform innovation. Social media companies are investing heavily in commerce-enabling features such as in-app checkouts, AI-powered product recommendations, and integrated payment systems to streamline the shopping journey (LaFleur, 2023).

For businesses, social commerce offers new opportunities to reach target audiences through personalized, data-driven strategies. Retail giants like Amazon combine user data from website visits with insights from social media interactions—such as likes, shares, and comments—to identify trends and tailor product offerings. This information is then used to deliver highly targeted advertisements, including sponsored posts, influencer campaigns, and display ads across search engines and social feeds.

One of the most powerful aspects of social commerce is user-generated content. Shoppers often rely on peer opinions when making purchasing decisions. Reviews, unboxing videos, and product tutorials shared by other users or influencers play a critical role in building trust and influencing prospective buyers. This peer-to-peer dynamic not only boosts brand credibility but also creates a sense of community around products and services.

In conclusion, social commerce represents a fundamental shift in how e-commerce operates. It merges the connectivity of social media with the utility of digital marketplaces, creating a dynamic and engaging shopping experience. As consumer behaviour continues to evolve, and digital platforms become more sophisticated, social commerce is poised to become a dominant force in the future of online retail.

3.5 Voice commerce

Voice commerce, or V-commerce, refers to the interaction between a customer and a computer system through spoken language, eliminating the need for physical interfaces such as a keyboard, touchscreen, or mouse. This interaction is powered by smart speakers and AI-based voice assistants, which interpret human speech to perform tasks (Vozza, 2023). As an emerging channel within digital commerce, voice commerce is redefining how consumers search for products, place orders, and engage with brands in a more convenient, hands-free manner.

Leading voice assistants such as Amazon's Alexa, Google Assistant, and Apple's Siri are at the forefront of this development. These AI-driven systems enable users to carry out a variety of everyday tasks—from managing smart homes to making online purchases—using only their voice. While still in its early stages, voice commerce is steadily gaining traction worldwide. Although it accounted for just 0.2% of total e-commerce transactions in 2023, analysts project a sharp increase in both adoption and transaction volume in the coming years as the technology matures and users grow more comfortable with voice interactions (Vozza, 2023).

One of voice commerce's greatest strengths lies in its user-centric design. It enables a frictionless shopping experience, particularly for routine or repeat purchases like groceries or household supplies. A customer can simply say, "Order more coffee," and the system will place an order based on their previous buying behaviour. This

level of automation not only simplifies transactions but also enhances personalization and convenience.

In addition to convenience, voice commerce offers retailers valuable data insights. By analysing customer voice queries, businesses can identify trends in consumer demand, detect frequently requested products, and optimize their inventory accordingly. These insights also allow for more targeted marketing campaigns and personalized product recommendations (Davidov, 2022). In this way, voice commerce supports data-driven decision-making and enhances overall customer engagement.

The scope of voice commerce is rapidly expanding. Originally limited to simple tasks such as placing grocery orders or checking delivery statuses, it now includes more complex transactions like booking travel arrangements, managing finances, and requesting services. Retailers are increasingly investing in developing voice-activated applications, or "skills," to enable users to interact with their online stores through smart speakers. These custom voice applications aim to create a more intuitive and responsive shopping journey.

Smart speakers themselves have evolved into multifunctional devices. Aside from enabling voice shopping, they serve as hubs for managing connected smart home devices such as lighting systems, thermostats, and appliances. They can also provide real-time information like weather updates, news briefings, reminders, and calendar management. As these devices become more integrated into daily life, the potential for voice commerce continues to expand (Davies, 2024).

In conclusion, voice commerce represents a promising frontier in the evolution of e-commerce. It offers convenience, personalisation, and innovation by enabling hands-free, conversational interaction between consumers and digital platforms. As technology advances and consumer trust in voice systems grows is expected to become a standard feature of the online shopping experience

3.6 Augmented reality and virtual reality

Augmented reality (AR) and virtual reality (VR) are emerging as transformative technologies in e-commerce, revolutionizing how customers interact with products and make purchasing decisions. These immersive technologies bridge the gap between online and physical retail by creating dynamic, interactive experiences. (Hanak, 2024).

AR enriches the physical world by overlaying digital elements onto real environments. This allows consumers to visualize how a product will look or function in their actual space—such as seeing furniture in their living room or previewing how a pair of shoes fits with their outfit. In contrast, VR provides a fully simulated environment where users can explore virtual stores or product worlds, offering a unique and engaging online shopping experience (Hanak, 2024).

With AR and VR, customers can browse and purchase products online through highly engaging interfaces that simulate physical settings. Virtual try-ons enable shoppers to assess clothing, accessories, or makeup before deciding. In contrast, virtual showrooms replicate retail environments, allowing consumers to walk through store layouts or view how items would appear in their homes. These innovations provide a solution for one of the key limitations of online shopping—the lack of tactile interaction—and allow businesses to present their products in a more comprehensive, user-friendly manner. As a result, these technologies can significantly boost customer satisfaction, strengthen brand loyalty, and increase conversion rates (Thakkar, 2018).

According to Hanak (2024), AR and VR technologies enable the following advancements in e-commerce:

- Virtual Try-Ons: Customers can try on clothes, accessories, or cosmetics virtually before making a purchase decision.
- Virtual Showrooms: Products can be displayed in virtual spaces that mimic real-life store layouts or home settings.
- Interactive Product Visualization: Shoppers can explore product details from every angle, enhancing product understanding and reducing return rates.

– Virtual Events and Experiences: Retailers can organise online events such as product launches, fashion shows, or immersive brand experiences to engage consumers more deeply.

These technological advancements do not exist in isolation. Modern e-commerce is being reshaped by a broader wave of digital transformation, where AR and VR are joined by other innovations that collectively redefine how e-commerce operates. The Internet of Things (IoT) facilitates seamless connectivity between devices, automating operations and enhancing logistics. Artificial Intelligence (AI) and Machine Learning (ML) enable data-driven personalization, allowing online platforms to recommend products, adjust pricing dynamically, and detect fraud in real-time. These smart technologies also help in forecasting demand, managing inventory, and optimizing the overall supply chain.

Together, these innovations are transforming the digital shopping experience from a static, one-dimensional process into a dynamic, responsive, and user-centric journey. As AR and VR become more accessible and affordable, their adoption across the e-commerce industry is expected to rise, offering retailers a powerful competitive advantage in an increasingly experience-driven marketplace.

4 Pilot research study and its findings

The research data was collected using an online questionnaire designed with the Google Forms platform and distributed via a personal profile on the social media network Facebook. The study follows a cross-sectional design, as participants were contacted only once. It combines both retrospective and prospective elements—participants were asked to reflect on their past online shopping experiences as well as to share their expectations regarding next-generation online stores.

A total of 71 respondents (N = 71) participated in the survey published on Facebook. Of these, 62% (44 respondents) identify as female and 38% (27 respondents) as male.

Respondents were categorized into four age groups: under 18 (1.4%), 18 to 30 (23%), 30 to 50 (45%), and over 50 years (31%).

In the next section of the questionnaire, participants were asked to reflect on their previous experience with online shopping and identify what they considered the most important feature of an online store. The response options included:

- better access to information across multiple pages,
- the ability to place orders 24/7,
- access to customer feedback,
- discount codes,
- the ability to order without geographical limitations and
- a wide selection of products and services.

Figure 1 shows that the majority of respondents (32%) considered a wide selection of products and services to be the most important feature. This finding indicates that consumers highly value diversity and choice when shopping online. Other notable features included the ability to place orders at any time (24/7), selected by 20% of participants, highlighting the need for accessibility and flexibility. Another notable feature was better access to information across websites, chosen by 18%, which highlights the importance of clear, detailed, and easily accessible product information.

Discount codes, selected by 16% of respondents, reflect a desire for favourable pricing and promotional offers, while only 10% valued the ability to place orders without geographic restrictions. The least valued feature was access to customer feedback, which was selected by just 4% of participants as the most important.

These results suggest that when choosing online stores, consumers prioritize the variety of products and services offered, which may indicate a preference for more personalized and versatile shopping experiences.

Figure 2 presents the results of the survey question: "How do you most often find the products you order?", providing insight into participants' shopping habits and preferences when searching for products online. Respondents could choose among several options: via social media platforms (Facebook, Instagram, TikTok, etc.), through search engines and websites, using voice assistants such as Siri or Alexa, or via email messages.

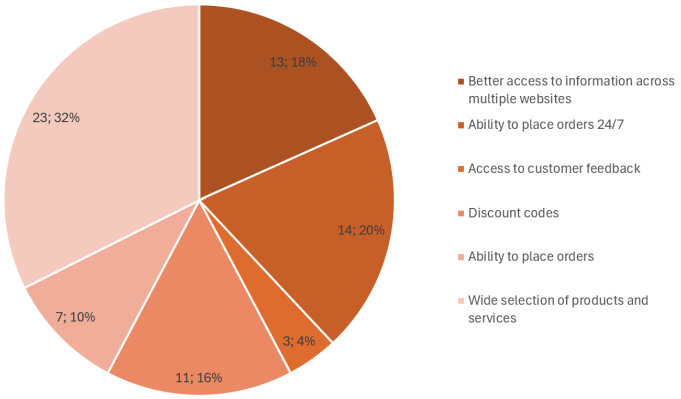


Figure 1: Most Important Features of Online Stores

The results indicate that consumers most frequently (54%) use search engines to independently browse websites and find the products they intend to purchase. Additionally, 45% of respondents reported that they typically order products discovered on social media platforms such as Facebook, TikTok, and Instagram. Only 1% of participants stated that they most often find products through promotional emails, while none of the respondents indicated using voice commerce via Siri or Alexa to discover products.

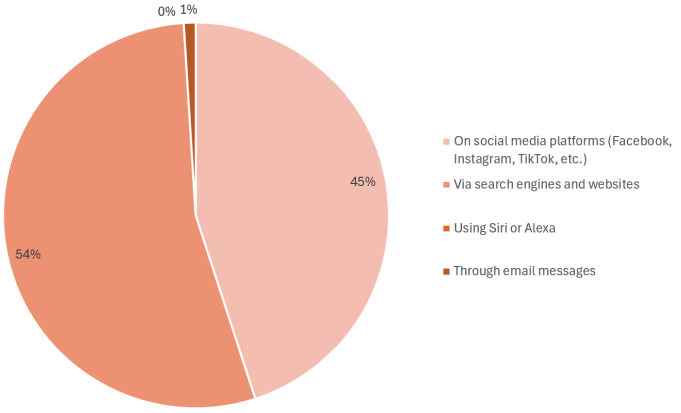


Figure 2: A most common method for finding products ordered online

Figure 3 presents the results of the survey question: "What is the main reason you most often do not complete an online purchase?" Respondents were able to choose from a range of reasons, such as high delivery costs, a complicated payment process, lack of trust in website security, insufficient product information, long estimated delivery times, or unclear return policies. The purpose of this question was to identify the main obstacles consumers face when shopping online and to understand which factors online retailers should improve to increase their cart completion rates.

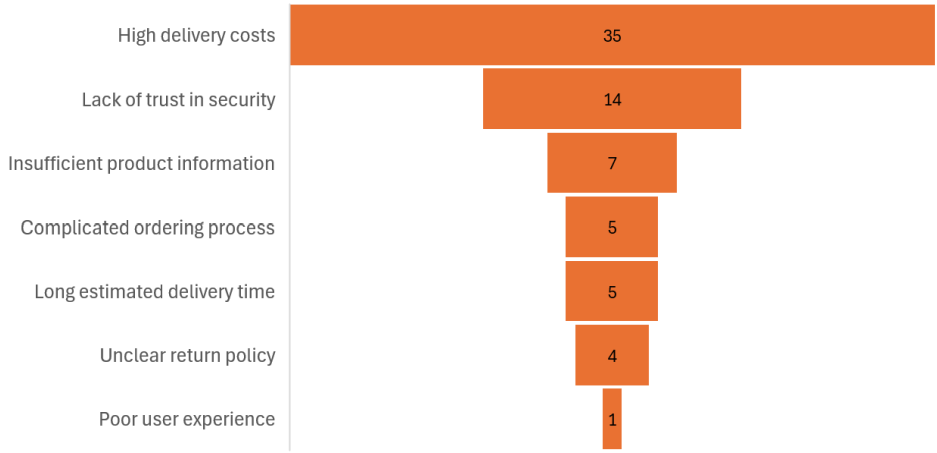


Figure 3: Reasons for Incomplete Online Purchases

The data reveals that the most common reason for abandoning an online purchase is high delivery costs, selected by more than half of the respondents (35). This was followed by a lack of trust in the security of online transactions, chosen by 14 respondents. On the other hand, the factor with the least influence on purchase abandonment appears to be a poor user experience, with only one respondent indicating this as their primary reason for not completing a transaction.

Figure 4 displays the results of the survey question: "Do you check multiple websites offering the same product before completing an online purchase?" The objective of this question was to determine the extent to which consumers compare prices and offers across different online platforms. Such behaviour may reflect a desire to find the best deal, compare service quality, evaluate delivery options, or assess the trustworthiness of sellers.

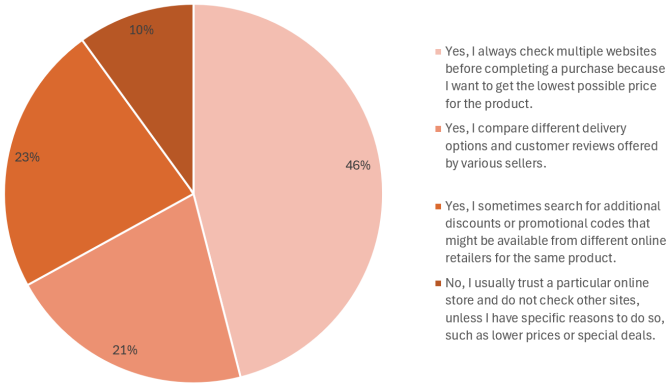


Figure 4: Comparison of Multiple Websites Before Completing an Online Purchase

The results provide insights into how consumers conduct pre-purchase research and the key factors influencing their decision-making process. As shown, 46% of respondents reported that they check multiple websites to ensure they get the lowest possible price for a given product. Additionally, 23% search for discounts or promotional codes across different websites. Another 21% compare various delivery options and read customer reviews from different retailers before making a purchase decision. Only 10% of respondents reported that they do not compare websites, indicating a high level of trust in a single, preferred online store.

Figure 5 presents the trends in web commerce and the number of respondents who have already encountered them.

As shown, the most common trend experienced by 73% of participants (52 respondents) is the use of website cookies. Additionally, 45% (32 respondents) reported having interacted with a chatbot during online shopping. The third most recognized trend is personalization, which was encountered by 18% of the respondents (13). Furthermore, 17% (12 respondents) answered negatively, indicating they had not knowingly encountered any of the listed trends.

Other trends appeared to be less familiar to the respondents; however, it is likely that many of them have, at some point, experienced multichannel web commerce or augmented and virtual reality without being fully aware of it. To address this, the

following section of the survey assessed whether participants actually recognize and distinguish between the concepts of augmented reality and virtual reality.

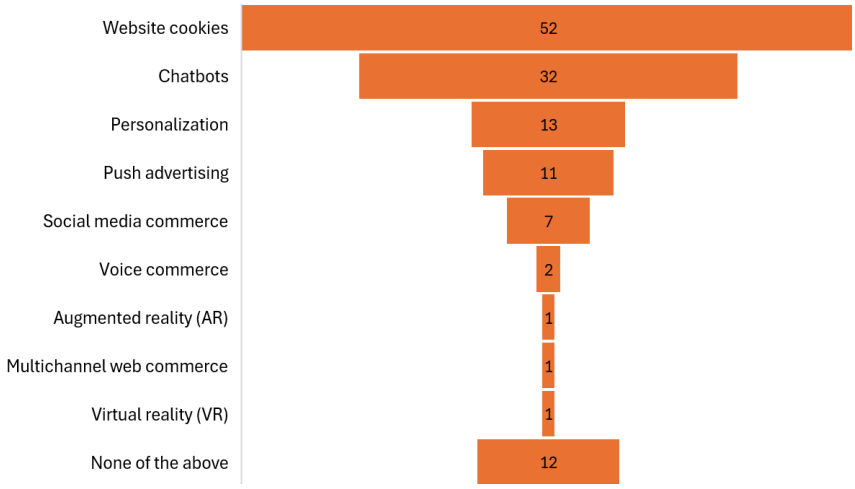


Figure 5: Overview of Web Commerce Trends Encountered by Respondents

Figure 6 shows the responses to the question regarding the importance of chatbots and their impact on user experience.

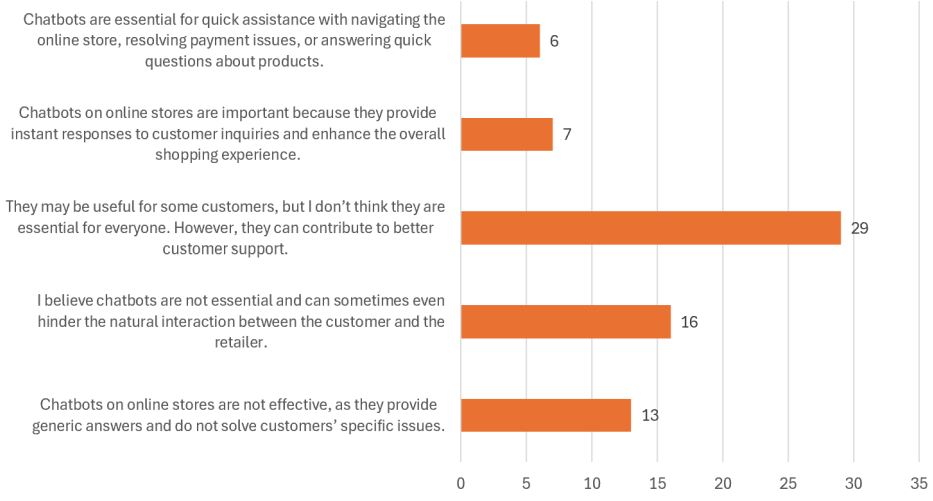


Figure 6: The Importance of Chatbots and Their Impact on User Experience

Most of the respondents, 41% (29), believe that chatbots are not essential for all customers but can contribute to improved customer support. Only 9% (6) consider chatbots to be crucial for providing quick assistance with website navigation, payment issues, and general product inquiries. Additionally, 10% (7) view chatbots as important for delivering instant answers to customer questions, thus enhancing the overall shopping experience.

Conversely, 18% (13) of respondents believe that chatbots are ineffective because they provide only generic responses and fail to address customers' specific problems. Furthermore, 23% (16) agree with the statement that chatbots are not essential and may sometimes hinder the natural interaction between the customer and the online store.

These findings highlight a divided perspective on the effectiveness of chatbots in e-commerce. While many respondents recognize their value as tools to improve customer support, a significant portion remains sceptical about their effectiveness due to the impersonal and limited nature of their responses. Some also feel that chatbots may disrupt the natural communication flow between customers and retailers. For online businesses, these insights suggest the importance of implementing a balanced strategy, one that supplements rather than replaces human customer service. A hybrid model, combining automated efficiency with personalized human interaction, may be the most effective approach to improving customer satisfaction and enhancing the overall user experience.

A simple question was posed in the survey: whether respondents can distinguish between virtual reality (VR) and augmented reality (AR) (Figure 7).

Survey results indicate that 62% (44 respondents) are unable to differentiate between theaugmented reality (AR) and virtual reality (VR), which is significantly higher proportion compared to the 38% (27 respondents) who recognize the difference. This indicates a relatively low level of awareness and understanding of these technologies, which could pose a challenge for businesses aiming to implement AR and VR features in their online shopping experiences.

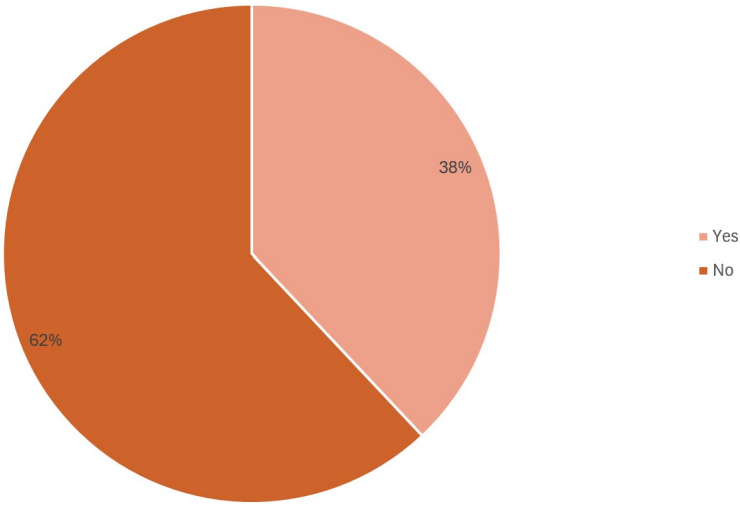


Figure 7: Differentiation between Virtual Reality (VR) and Augmented Reality (AR)

The survey then aimed to assess how well respondents could distinguish between augmented and virtual reality by using two images (Figure 8). The upper image depicts IKEA's mobile application, which allows customers to shop using augmented reality (AR). The application overlays virtual furniture into real-life spaces, enabling customers to see how items would fit and complement their existing home décor. 49% (35 respondents) correctly identified this example as AR.

In the lower part of Figure 8, a scenario of a vehicle prototype configuration in a simulated showroom environment, which represents virtual reality (VR), is presented. However, 20% (15 respondents) incorrectly identified this image as augmented reality. In addition, 31% (22 respondents) were unable to determine which of the two images illustrated augmented reality.

These findings confirm a significant lack of understanding among respondents regarding the difference between AR and VR, reinforcing previous results. This suggests that online retailers should invest more in educating and informing their customers about these emerging technologies—especially those that are already being integrated into the shopping experience.

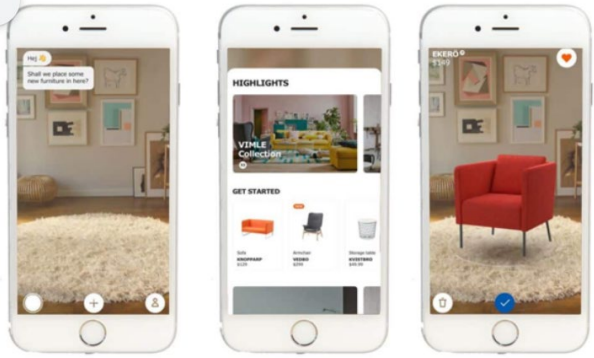
Which of the images represents augmented reality?	N=71 Frequency	%
 Top image	35	49 %
I don't know	22	31 %
Bottom image 	15	20 %

Figure 8: Differentiation between augmented and virtual reality based on visual examples

Figure 9 presents the results of a survey question exploring whether the ability to try products in augmented reality (AR) would influence participants' willingness to overlook delivery costs during online purchases.

According to the results, 14% (10 respondents) stated that they would be more likely to disregard delivery fees if an online store offered the option to preview products using AR. Additionally, 45% (32 respondents) indicated that they would only be willing to overlook delivery costs if the AR experience was highly convincing and significantly reduced the risk of making an incorrect purchase. This finding suggests

that AR has the potential to positively influence purchase decisions by providing consumers with a more accurate and immersive product experience. By minimizing the uncertainty and dissatisfaction associated with online shopping, AR may help retailers enhance customer, ultimately leading to higher conversion rates and reduced return rates.

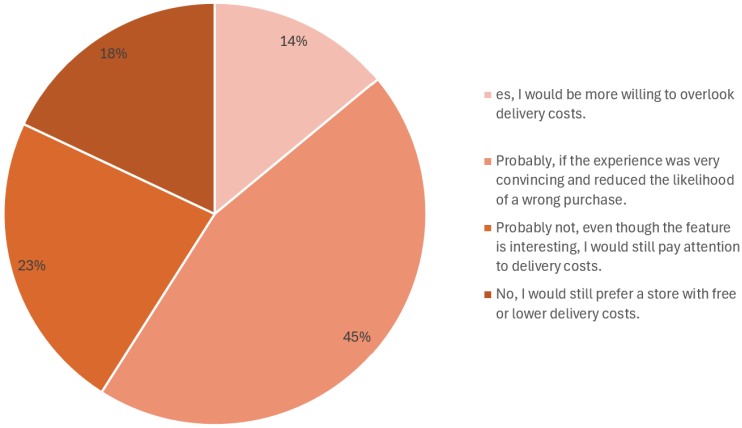


Figure 9: The impact of AR product trials on overlooking delivery costs in online shopping

On the other hand, 23% (16 respondents) indicated that even though AR product trials are a compelling feature, it would not be enough to ignore delivery fees. Meanwhile, 18% (13 respondents) believed that the option to try products in AR is not important at all and would still prefer stores that offer free or lower-cost shipping.

Overall, these findings indicate that AR can significantly impact consumer behaviour regarding delivery charges. A high-quality AR experience may encourage customers to overlook delivery costs; however, actual shipping prices and perceived product value remain decisive factors. Online retailers should, therefore, consider these insights when designing strategies to improve the overall shopping experience.

To examine customer expectations regarding next-generation online stores, we aimed to gain insight into which aspects of online shopping respondents consider most important for the future. These include factors such as security, technological trends, integration with social media, and personalization.

Figure 10 presents the expectations of respondents concerning next-generation online stores. The data reveals that the majority—45% (32 respondents)—expect future online stores to prioritize improving security and protecting customers' personal data. Interestingly, only 13% (9 respondents) expect that advanced technologies such as augmented reality, artificial intelligence, and personalization will be heavily utilized. This suggests a gap between technological capabilities and consumer awareness or demand, indicating a potential need for educational initiatives to showcase the value of these innovations. A notable 24% (17 respondents)—anticipate that online stores will strengthen their integration with social media. Meanwhile, 17% (12 respondents) expect personalized experiences tailored to their specific needs and preferences.

What are your expectations for next-generation online stores?	Frequency	%
I expect next-generation online stores to focus more on offering personalised experiences tailored to the specific needs and preferences of each individual user.	12	17 %
I expect online stores to become increasingly integrated with social media, enabling a more interactive and social shopping experience.	17	24 %
I expect next-generation online stores to make extensive use of advanced technologies, such as augmented reality, artificial intelligence, and automation.	9	13 %
I expect online stores to prioritise improving security and the protection of customers' personal data.	32	45 %
Other: – Greater ecological awareness and less commercialisation.	1	1 %

Figure 10: Expectations for Next-Generation Online Stores

An interesting perspective was shared under the "Other" option: "As much ecological awareness as possible and less commercialization." This comment highlights the importance of environmental issues, which may have been somewhat overlooked in the study. However, an increasing number of online stores are moving toward sustainable practices—be it through eco-friendly materials, sustainable packaging, or greener delivery methods—reflecting the growing demand for environmental awareness among consumers.

The findings clearly indicate that respondents emphasize the importance of data security and protection, which will need to be at the forefront of online store development in the future.

Figure 11 shows that only 4% (3 respondents) believe that new trends in web commerce could contribute to greater security and trust—provided that appropriate security measures, such as data encryption and secure authentication, are properly implemented. In contrast, as many as 34% (24 respondents) believe that emerging trends like personalized experiences and the integration of social media could decrease trust in online security, as they involve increased collection and use of personal data. Meanwhile, 45% (32 respondents) feel that trustworthiness depends on whether online retailers are able to clearly communicate their security and privacy policies and ensure adequate protection of personal information. Lastly, 17% (12 respondents) found it difficult to assess the situation due to a lack of relevant knowledge or experience.

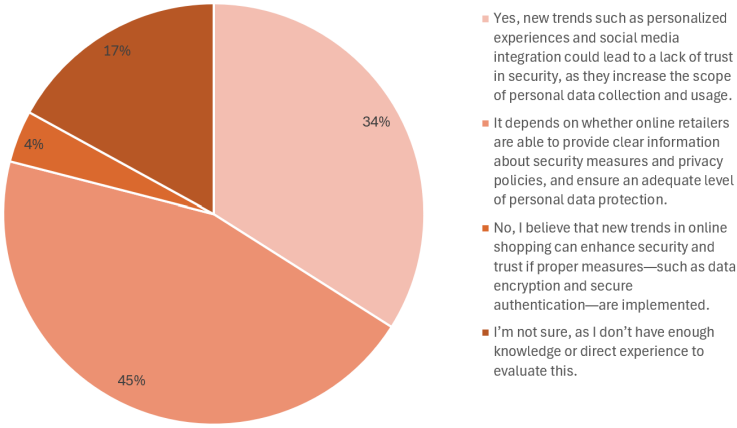


Figure 11: Lack of trust in the security of online shopping due to emerging trends

These responses reveal a divided perception among participants. Based on the findings, we conclude that online retailers will need to dedicate increasing attention to ensuring secure online shopping—particularly by clearly communicating their data protection measures—to strengthen customer trust.

The findings of the study clearly indicate that online retailers will need to place data security and the protection of personal information at the core of their future development efforts. They will need to invest in advanced security technologies and communicate transparently about their data protection practices in order to maintain

and strengthen customer trust. Surprisingly low interest in advanced technologies such as augmented reality (AR) and artificial intelligence (AI) suggests that retailers still have work to do to raise awareness and educate consumers about the benefits these technologies can offer. Furthermore, the growing concern for ecological awareness indicates that future online stores will need to invest more significantly in sustainable practices, which include careful consideration of materials, products, packaging, and delivery methods. Aligning their strategies with user expectations in these areas will be crucial. Ultimately, the success of online commerce will depend on how effectively it can address these evolving consumer priorities.

5 Discussion

The findings of the pilot study provide valuable insight into consumer perceptions, behaviours, and expectations concerning modern developments in web-based commerce. The data suggests that while consumers are increasingly dependent on digital shopping environments their attitudes are shaped by a dynamic interplay between usability, convenience,cost, trust, and technological awareness.

A key result of the study is the high importance placed on product and service variety, which was identified as the most valued feature of online stores among respondents. This indicates that today's consumers expect online platforms to offer broad, diverse, and accessible inventories, allowing them to find exactly what they need in one place. Additional features such as 24/7 availability and easy access to relevant product information also ranked highly, confirming that convenience and well-informed decision-making are critical components of the user experience.

Despite the growing popularity of e-commerce, the study reveals that certain barriers to purchase completion remain prevalent. The leading cause of cart abandonment is still high delivery costs, followed by concerns regarding the security of online transactions. These findings highlight the continued importance of cost transparency and robust security in influencing consumer behaviour. It is notable that only a small fraction cited poor user experience as a key deterrent, suggesting that technical usability has generally improved, while economic and trust-related factors remain more decisive.

Another important insight relates to the way consumers search for products. Although social media plays an increasingly visible role in product discovery (with 45% of respondents frequently purchasing items encountered on platforms like Facebook and Instagram), search engines and direct browsing remain the primary method for finding products online (54%). This suggests that while social commerce is rising, traditional search behaviour still dominates.

When it comes to new technological trends, there is a clear gap between usage and awareness. While cookies and chatbots were recognized by most respondents, more advanced technologies such as augmented reality (AR), virtual reality (VR), and voice commerce are still under-recognized or misunderstood. The inability of most respondents to distinguish between AR and VR, even when presented with visual examples, illustrates a lack of familiarity with these technologies—despite their growing integration into modern e-commerce platforms.

Moreover, the impact of AR on purchase behaviour was shown to be promising, with a significant proportion of respondents indicating they would be more likely to overlook delivery costs if AR provided a convincing and realistic preview of products. This highlights AR's potential as a tool not only for improving the user experience but also for influencing economic decision-making. However, cost sensitivity remains high, as some consumers would still prioritize lower shipping fees over technological enhancements.

The perception of chatbots also varied significantly. While many respondents acknowledged their usefulness in providing instant customer service, others criticized them for offering only generic responses and disrupting natural customer-retailer interactions. This indicates that, although automation can improve efficiency, a human-centered approach is still vital—particularly for complex queries or personalized support.

One of the most prominent concerns expressed by respondents was data privacy and online security. With 45% expecting future online stores to focus on protecting personal information, and 34% believing that trends such as personalization and social media integration may lead to trust issues, it is evident that digital trust remains a central factor in e-commerce adoption. Only 4% of respondents saw new trends as a direct contributor to better security—suggesting that most consumers are

skeptical about the safe use of emerging technologies. Importantly, 45% indicated that their trust depends on how transparently retailers communicate about data protection, emphasizing the importance of clear privacy policies, encryption standards, and ethical data use.

Finally, while personalization and technology adoption are among the core strategies of modern web commerce, only 13% of respondents expected heavy implementation of advanced technologies in the future. This underlines a gap between industry innovation and consumer perception, possibly due to a lack of exposure, understanding, or education. On the other hand, the call for ecological awareness expressed by some participants highlights a growing expectation for sustainable business practices, signalling a broader shift toward ethical consumerism.

In conclusion, while consumers are generally open to new developments in web commerce, their expectations are rooted in practical benefits—such as convenience, price transparency, and security—rather than in purely technological novelty. For businesses, this presents an opportunity to bridge the gap between innovation and user engagement through better education, transparent communication, and continued investment in secure, accessible, and sustainable e-commerce environments.

6 Conclusion

In recent decades, we have witnessed the rapid development of the Internet, which has profoundly transformed the global business environment. As internet access expanded, companies began to leverage its potential for improving customer communication and streamlining business processes. The rise of e-commerce opened new avenues for simple, efficient shopping and end-to-end management of transport and logistics. Today, e-commerce stands as one of the most dynamic and rapidly evolving sectors, closely interwoven with advancing digital technologies.

This thesis explored emerging technological trends—including artificial intelligence (AI), the Internet of Things (IoT), augmented reality (AR), virtual reality (VR), voice commerce, chatbots, and social commerce—which are progressively reshaping the online shopping experience. These innovations have the potential to personalize customer journeys, automate service delivery, and enhance operational efficiency. In

particular, AI is proving essential for data-driven decision-making, dynamic pricing, fraud detection, and targeted marketing.

The pilot study provided empirical insight into consumer behaviour in relation of these trends. While respondents largely appreciated the convenience and product diversity offered by online shopping, they remained sensitive to delivery costs, concerned about data security, and divided on the utility of emerging tools. Although trends like cookies and chatbots are widely recognized, more advanced tools–such as AR and VR–are less understood, indicating a clear need for greater user education and technological familiarization.

The study also emphasized the crucial importance of trust and transparency in digital commerce. Consumers expect online stores to prioritize the ethical use of their personal data, communicate privacy policies clearly, and adhere to robust cybersecurity standards. Furthermore, the growing emphasis on sustainability signals that modern shoppers value not only efficiency and innovating but also environmental and social responsibility.

Interestingly, although only a minority of respondents currently recognize the practical value of technologies like AR, the data suggests that realistic and user-friendly implementations of this technology can positively influence purchasing behaviour- potentially offsetting concerns related to costs and risk.

While chatbots and automation are gaining ground, their adoption must be carefully balanced with human support to ensure a positive and personalized customer experience. Retailers must also navigate the challenges of over-automation, which may alienate customers seeking authentic interaction.

In conclusion, the success of future e-commerce ventures will not depend only on the implementation of cutting-edge technologies, but on businesses' ability to build trust, deliver value, educate users, and adhere to sustainable practices. These factors will be essential in shaping a competitive, ethical, and user-centered digital marketplace.

One limitation of this study is the small sample size, which may not provide a fully representative view of the broader population. Additionally, the underrepresentation of respondents under the age of 18 - a demographic likely to possess distinct, tech-forward shopping behaviours – may have skewed the results toward more conventional perspectives.

Future research could benefit from larger, more diverse samples, enabling more robust comparisons across age groups, regions, and socioeconomic backgrounds. It would also be valuable to conduct longitudinal studies to track how consumer attitudes evolve as emerging technologies become more prevalent. Another promising direction would be to examine the organisational adoption of these technologies and how employees adapt to digital transformation in retail environments.

References

Bhargava, V. (2023). *Ecommerce Chatbots: What They Are and Use Cases*. Shopify. Retrieved April 1, 2024, from https://www.shopify.com

Cahn, J. (2017). *Chatbot: Architecture, Design, & Development*. School of Engineering and Applied Science. Retrieved March 11, 2024, from https://d1wqtxts1xzle7.cloudfront.net

Davidov, R. (2022). *Accelerating ecommerce growth with predictive analytics*. Itransition. Retrieved October 20, 2023, from https://www.itransition.com/predictive-analytics/ecommerce

Davies, M. (2024). *Home Technology: Are smart speakers worth it?* Age Times. Retrieved August 8, 2024, from https://www.agetimes.co.uk/technology/home-technology/are-smart-speakers-worth-it

Duggal, N. (2023). *Top 9 New Technology Trends for 2022*. SimpliLearn. Retrieved October 15, 2023, from https://www.simplilearn.com/top-technology-trends-and-jobs-article

ECDB. (2023). *eCommerce market in Slovenia*. ecommerceDB. Retrieved September 5, 2023, from https://ecommercedb.com/markets/si/all

Hanak, A. (2024). *eCommerce Technology: Top 10 Trends Shaping 2024's Retail Landscape*. Digitalsilk. Retrieved April 1, 2024, from https://www.digitalsilk.com/digital-trends/ecommerce-technology

Koteshov, D. (2024). *How to Boost Revenue Growth with eCommerce IoT*. Startups Etam. Retrieved April 10, 2024

LaFleur, G. (2023). *Social commerce*. TechTarget. Retrieved August 8, 2024, from https://www.techtarget.com/searchcustomerexperience/definition/social-commerce

Linda, S.-l. L. (2010). Social commerce – e-commerce in social media context. *World Academy of Science Engineering and Technology*, 4(12), 39–44.

Pasquali, M. (2023). *E-commerce worldwide – statistics & facts*. Statista. Retrieved August 13, 2023, from https://www.statista.com/topics/871/online-shopping

Ranger, S. (2020). *What is the IoT? Everything you need to know about the Internet of Things right now*. ZDNET. Retrieved October 15, 2023, from https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/

Sakovich, N. (2023). *Top 10 Information Technology Trends in 2022*. Sam Solutions. Retrieved October 15, 2023, from https://www.sam-solutions.com/blog/top-five-information-technology-trends-to-watch-in-2019/

Santos, V. F., Sabino, L. R., Morais, G. M., & Gonçalves, C. A. (2017). E-commerce: A short history follow-up on possible trends. *International Journal of Business Administration*, 8(7), 130–138.

Statistical Office of the Republic of Slovenia. (2023). *Number of individuals by purpose of internet use by age group and gender, Slovenia, annually*. SiStat. Retrieved September 2, 2023, from https://pxweb.stat.si/SiStatData/

Thakkar, M. (2018). *How AR and VR are Transforming E-commerce*. Synoptek. Retrieved May 3, 2024, from https://synoptek.com/insights/it-blogs/ar-vr-ecommerce

Vekony, B. (2023). *12 Best Machine Learning Strategies for eCommerce Businesses*. Prefixbox. Retrieved October 20, 2023, from https://www.prefixbox.com/blog/machine-learning-for-ecommerce

Vozza, S. (2023). *Voice Commerce: Definition, Benefits, and Advice for Retailers (2024)*. Shopify. Retrieved February 22, 2024, from https://www.shopify.com/retail/voice-shopping-what-retailers-need-to-know

Zheng, Q. (2010). *Introduction to E-commerce*. Beijing: Tsinghua University Press.

About the authors

Tamara Križnjak developed an early interest in economics at the Secondary School of Economics in Ptuj, further enriched by an Erasmus+ exchange in Finland. She earned her bachelor's degree in economics and public sector management in 2021 and completed her master's in 2024 at the Faculty of Economics and Business, University of Maribor. Her research focuses on urbanisation, economic growth, and online commerce trends. Outside of academics, she enjoys travelling and connecting with diff.

Dr. **Samo Bobek** is a professor of E-business and Information Management at the Faculty of Economics and Business, University of Maribor, where he also serves as head of the E-business Department. His research focuses on e-business, digitalisation, IT/IS governance, information management, business process reengineering, and the implementation of business solutions. In recent years, he has expanded his work to include the role of artificial intelligence in business, mainly how AI can drive innovation and improve decision-making processes.

Dr. **Simona Sternad Zabukovšek** is a professor of E-business and Information Management at the Faculty of Economics and Business, University of Maribor. Her research covers business process reengineering, business information systems (ERP, CRM), e-business models, digital transformation, and user acceptance of IT/IS. She also examines e-learning versus blended learning in organisations. Her work recently focused on integrating artificial intelligence into business processes to enhance decision-making and operational efficiency.