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The Influence of AI on Millennial Consumer Behavior.

Online Shopping in Finland.

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The influence of AI on millennial consumer behavior. Online shopping in Finland

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Abstract

The transformative influence of artificial intelligence (AI) on online shopping and consumer behavior was examined with an emphasis on millennials in Finland. The main goal was to analyze how AI-driven technologies such as chatbots, personalized recommendations, and personalized marketing, affect buying choices, customer satisfaction, and trust levels. An examination of ethical concerns, such as data privacy, and algorithmic bias were also examined to provide an in-depth comprehension of artificial intelligence's effect on consumer behavior. A qualitative research methodology was adopted, involving interviews with 10 millennials in Finland to collect detailed insights. Thematic analysis was conducted using NVivo 12 Plus software to reveal prevailing themes and trends in consumer attitudes towards AI technologies. The participants' experiences highlighted both the advantages and drawbacks of AI in the online shopping context. The results indicated that AI-powered tools significantly enhanced convenience, personalization, and decision-making processes, resulting in a remarkable increase in customer satisfaction. Nevertheless, issues concerning privacy, the absence of emotional intelligence in chatbots, and the risk of algorithmic bias were recognized as obstacles to building trust. It was concluded that although AI offers significant advantages for online shopping businesses, the successful implementation relies on acknowledging these challenges and aligning AI capabilities with the values and expectations of millennial consumers. The result offers practical insights for online businesses seeking to enhance their online shopping experience through AI integration.

Keywords/tags (subjects)

Artificial intelligence (AI), Millennial consumer behavior, online shopping, chatbots, Finland, customer loyalty, personalized marketing, privacy, and security, e-commerce.

Miscellaneous (Confidential information)

No confidential information was disclosed in the research.

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1 Introduction

This section offers a detailed overview of the study, including its origin, background, topic. I will also share what motivated me to dive into this research and explain why it matters to a broader audience. Lastly, I will describe the thesis so you know what to expect. Let's embark on this journey together, puzzling out the story behind my exploration.

1.1. Background

Finland has witnessed a transformative shift in consumer behavior in recent years, especially among millennials (Generation Y), generated by the increasing adoption of artificial intelligence in online retailing. As AI technologies modify and personalize online experiences, understanding their impact on the preferences and choices of millennial consumers becomes significant (Taylor, 2019). This shift is a global reflection of the digital age. This research endeavors to examine the detailed dynamic between artificial intelligence and online shopping habits of millennial consumers in Finland.

According to Schrontenboer (2019), integrating artificial intelligence in Finland's retail sector has influenced millennial consumer behavior by enhancing personalization and engagement through advanced technologies. Schrontenboer further noted that Finland's market has experienced a progressive digitalization, traditionally known for its vital brick-and-mortar stores. Millennial consumers born between 1981 and 1996 represent a pivotal demographic in the global consumer market, with their buying behavior significantly shaped by AI-driven technologies and digital tools. Millennials show a stronger preference for online shopping than previous generations, driven by their preference for convenience (Sonia, 2024).

This thesis aims to analyze the impact of artificial intelligence on the online shopping habits of millennials in Finland, with a specific focus on how AI-driven personalization, convenience, and customer service shape this demographic's purchasing habits. Furthermore, it will examine the potential challenges and concerns that could ultimately impact consumer trust and engagement. By conducting interviews with Finnish millennials, this study seeks to uncover important insights into how AI in shapes the future landscape of online shopping in Finland.

1.2. Motivation for the research

Understanding the intersection between artificial intelligence and Millennial consumer behavior in online shopping behavior is significant across different businesses. In this digital era of the world today, businesses are struggling with substantial effect of artificial intelligence on how they engage with consumer. Acknowledging how AI influences the decisions and preferences of millennials offers a strategic benefit for organizations aiming to excel in the e-commerce environment. It guides businesses in adapting to shifting consumer demands and technological advancement, while giving them a glance into the innovation of retail.

Exploring the influence of AI on millennial consumer behavior within Finnish online shopping context is not entirely an academic pursuit; it is vitally essential strategically; in the world today, digitalization is rapidly reshaping consumer habits, and companies aim to stay ahead by aligning its strategies with the preferences of its target audience millennials. Acknowledging the impact of AI allows companies to tailor their technological investments and customer engagement approach, ensuring relevance and competitiveness in the dynamic of the Finnish retail sector.

My interest in the dynamic intersection of technology and consumer behavior motivated me to explore this topic. Witnessing the rapid evolution of artificial intelligence and its tangible effects on how individuals, specifically millennials, engage with online shopping process. It seeks to uncover the complexities of a digital landscape where technology serves as both a tool and a key in influencing contemporary consumer choices.

1.3. Research objectives and questions

This study's mission is to explore the purpose of artificial intelligence in shaping millennial consumer behavior within online shopping in Finland. It delves into how artificial intelligence technologies will shape preferences, influence decision-making processes, and contribute to the online shopping experience of the millennial demographic in the Finnish market.

Based on this problem, some research questions were shaped. RQ1, which is the primary research question

RQ1: How does Artificial intelligence influence the online shopping behavior of millennials in Finland?

Two sub-questions were formed to provide a more detailed examination and explore specific aspects, such as the influence of personalized recommendations and the acceptance of AI features during the online shopping journey.

RQ2: To what extent do AI-driven personalized recommendations impact millennial consumers' product choices and purchasing decisions?

RQ3: How do millennial consumers in Finland perceive and interact with AI-powered features such as chatbots during their online shopping experiences?

1.4. Thesis Structure

This research document is structured around six principal chapters;

The first, Introduction which provides an overview of the study's back-ground, highlighting the transforming dynamics of online shopping in Finland while integrating artificial intelligence. Moreover, it describes the research motivation, objectives, and inquiries guiding the research.

Second chapter is the literature review: This section further examines the current literature regarding the influence of AI on consumer behavior, particularly concentrating on the preferences of millennials in online shopping. It also identifies the key theories, trends, and research gaps that lay the groundwork for this study.

The third chapter focuses on the methodology: This section elaborates on the research design, including the selection of participants, the data collection method, and the reason behind the chosen approach. It also discusses the ethical considerations and limitations associated with the study.

The fourth section is centered on data analysis and results, presenting the discoveries derived from the empirical data gathered during this research. It employs statistical analysis and qualitative insights to respond to the research questions and objectives.

The fifth chapter, discussion, evaluates the results in relation to the existing literature, offers insights on the effect of artificial intelligence on millennial consumer behavior in the Finnish online shopping landscape, and discusses the practical relevance of the findings for businesses and potential directions for future research.

The last chapter, conclusion, highlights the main discoveries and contributions of the study, provides a conclusion to the research questions, and outlines the broader significance to the research.

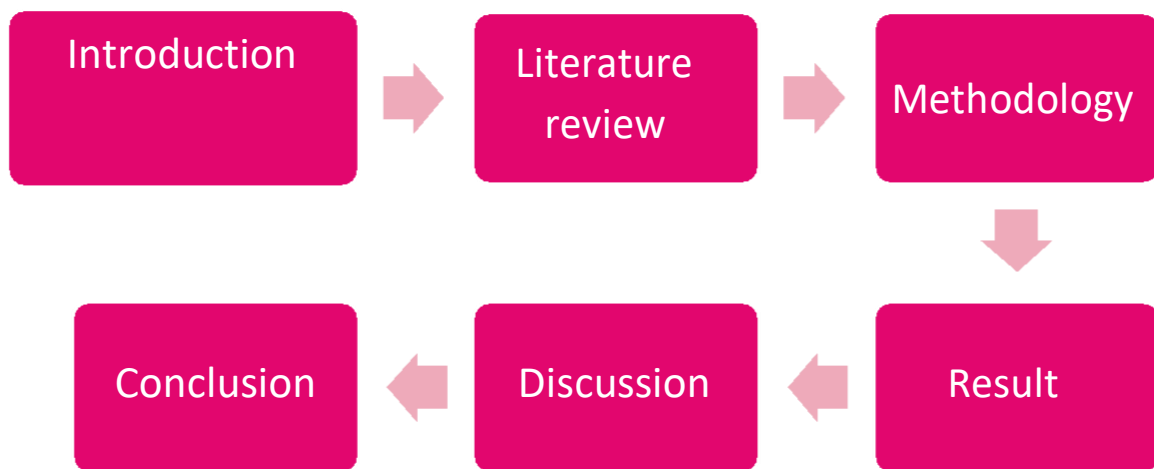


Figure 1 Structure of the research: (Author's own illustration)

2 Literature Review.

The fast-paced development of AI has made transformative changes in the online shopping landscape, changing how online businesses interact with their customers and influencing consumer behavior. In Finland, where digital literacy is widely spreading and e-commerce is rapidly expanding at a high speed, it is important for firms aiming to remain competitive to understand the impact of artificial intelligence on millennial behavior.

This literature review's main objective to comprehensively explore existing study regarding the impact of AI on millennial consumer behavior within online shopping, specifically focusing on Finland. By reviewing the present information on this topic, the goal is to highlight important issues and areas where future studies could be carried out. The information obtained will help businesses in Finland operating in the Finnish e-commerce sector.

The graphic representation below shows the summary of topics that are included in the theoretical knowledge of this research. The first subchapter is AI technologies, which focuses on the artificial intelligence tools used in online shopping; the following second and third subchapters examine millennial consumer behavior, showing the characteristics and behaviors of millennials when influenced by artificial intelligence and also the outcomes of Artificial intelligence on millennial consumer behavior. Finally, the last subchapter focuses on the study's geographical Location, Finland.

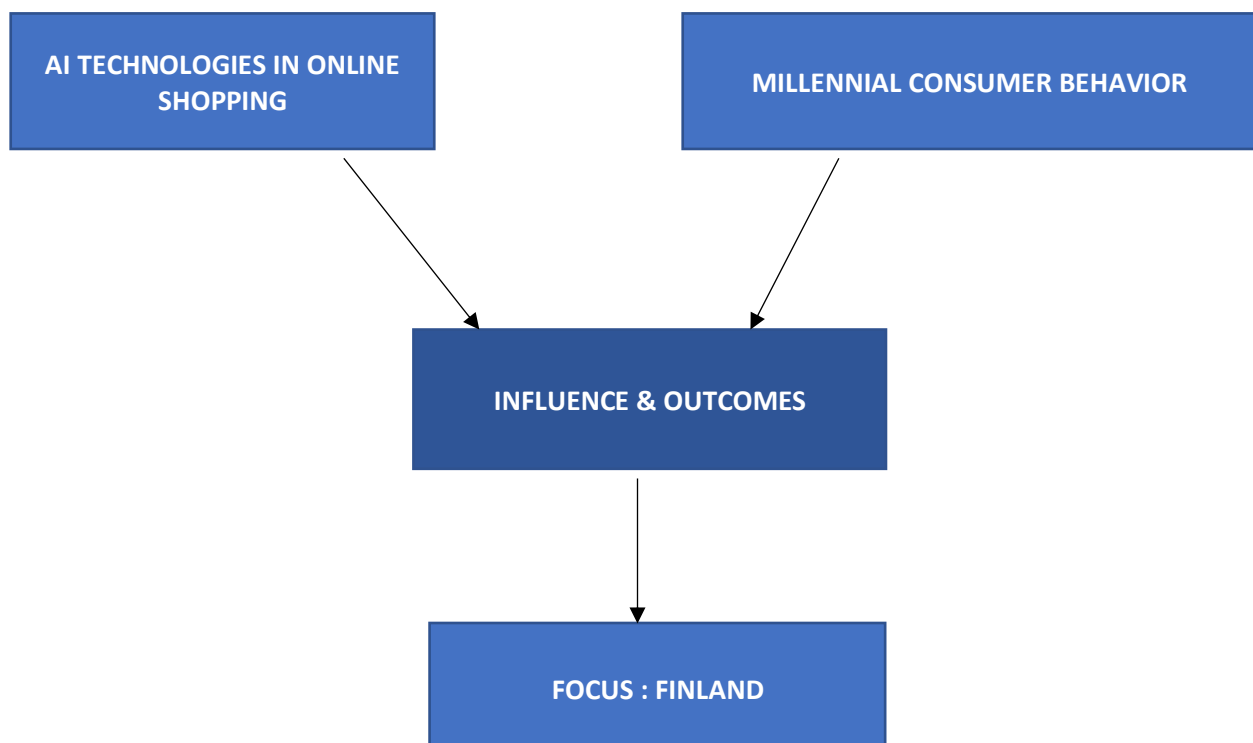


Figure 2 Overview of the literature review: (Author's own illustration)

2.1. Introduction of artificial intelligence technologies in online shopping

The incorporation of artificial intelligence into online retail is substantially transforming the e-commerce landscape in retail industries. Artificial intelligence technologies offer' personalized product recommendation systems, chatbots, and Personalized marketing, used in online shopping to improve the overall shopping efficiency and customer experience.

2.1.1. Personalized product recommendation systems

This system offered by artificial intelligence in online shopping explains how AI algorithms are applied to generate tailored product suggestions and analyze customer data according to unique preferences and behavior. An example of a recommendation system technology is a using collaborative filtering algorithm (Linyi, 2024); these algorithms analyze consumers' behavior and preferences to propose products that have been liked or purchased by similar users. For instance, when a customer purchases a computer online, the algorithm may suggest some related accessories like keyboards, mice or headphones.

A personalized product recommendation system is essential in enhancing customer experience, which could also foster customer loyalty.

The benefit of personalized product recommendation systems

Personalization: The system helps in suggesting products to customers, increasing their chances of purchasing.

Increases sales: By recommending relevant products, online stores can boost their sales and revenue since customers are most likely to find items, they might be interested in.

Customer satisfaction: Personalized product recommendations will increase customers' shopping experience, resulting in increased satisfaction and retention rate.

How can a personalized product recommendation system be implemented?

This system can be implemented by collecting and analyzing customer data, applying machine learning algorithms to forecast customers' preferences, and seamlessly integrating the customers' recommendations into their shopping experience.

Impact of personalized product recommendation system

It is beneficial to customers by simplifying their shopping experience. It also helps online businesses to increase customer engagement, increase sales, and stay competitive in the market.

2.1.2. Chatbots in online shopping

AI tools like chatbots has transformed online shopping by enhancing customer interaction and shopping experience. They are also developed to replicate human dialogue via text or voice messages. They employ natural language processing (NLP) to comprehend and reply to users' inquiries (Reddy et al., 2023). These chatbots efficiently handle customers' queries and enhance the efficiency of online store operations, reducing the demand for human support. AI-driven chatbots in online shopping, significantly enhance convenience by assisting users with product search selection and also provide post-purchase support, making the shopping experience for customers very satisfying.

Fig 3. Matini (2023) demonstrated a customer service chatbot conversation with a customer in their research, showing a simple scenario in which chatbots can provide a customer answer and what the response would be.

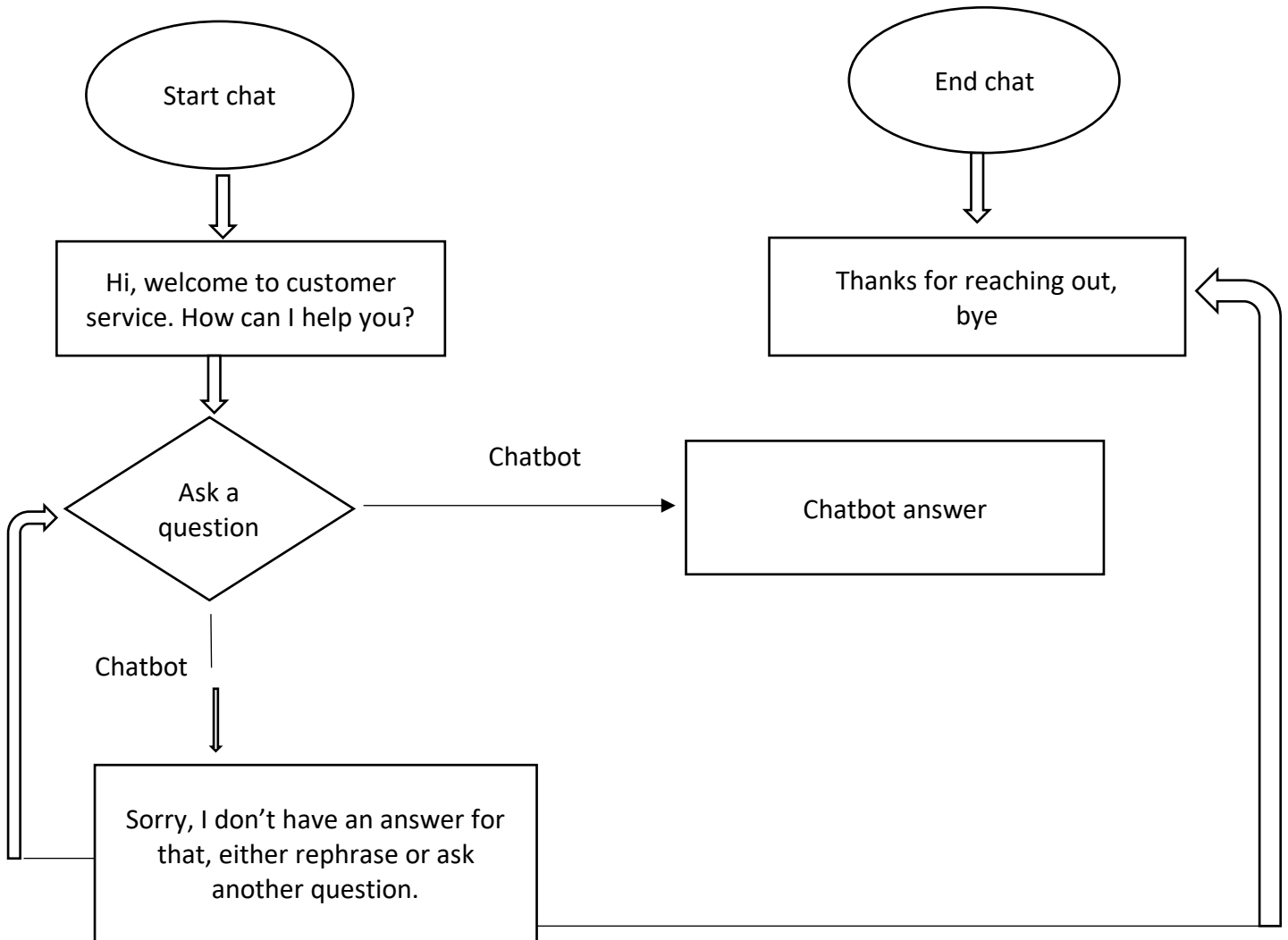


Figure 3 Chatbot conversation flow example (Matini, 2023)

Key features of chatbots in online shopping

Natural Language Processing (NLP) capabilities: Chatbots designed with advanced NLP technology, enables them to understand and interpret the user's inquiries in natural language, facilitating seamless communication (Maruthi et al., 2024).

Order management: Artificial intelligence-powered chatbots in online shopping manage customer orders, by assisting users with tracking updates, giving updates on shipping status and also providing information on refund policy, and handling returns or exchanges. This

process enhances customer experience as they can inquire about their orders or returns and receive instant replies from the chatbots.

Multilingual aid: Most chatbots in online shopping are designed to interact and communicate in multiple languages to ensure that individuals who speak different languages can comfortably interact with the platform. This feature widens the reach of online businesses to a more diverse audience and overcomes the problem of language barriers in the business.

Personalized recommendation: This is one of the key features of chatbots. These chatbots act as personalized shopping advisors. They assess customer behavior and tastes to offer tailored suggestions (Maruthi et al., 2024). It enhances the degree of customization in the online shopping journey.

Benefits of chatbots in online shopping

Scalability and cost-effectiveness: These chatbots manage multiple customer interactions simultaneously without increasing operational costs. These chatbots provide cost-effective solutions for businesses to improve customer service and increase sales in an ascendible way. This benefit is important for businesses that function within the e-commerce field, as these chatbots can manage large-scale customer inquiries without the need for additional resources, and it also ensures that businesses can handle peak customer demand, acquiring extra expenses.

Availability: According to a report by Reshmi and Balakrishnan (2018), chatbots are one of the most widely used technologies for implementing virtual assistance. AI-powered chatbots for online shopping are always available around the clock. They assist customers around the clock and provide instant assistance even after working hours. For example, suppose a customer has an urgent inquiry about a particular product after working hours. In that case, he does not need to worry about getting responses hours later because an AI-powered chatbot in online shopping responds instantly, thereby enhancing the efficiency of the business.

Data collection and analytics: During interactions, AI-powered chatbots in online shopping can gather valuable feedback and customer data, enabling online businesses to develop a deeper understanding of their customers' behaviors, preferences, and shared queries for subsequent improvement (Daud et al., 2024). These chatbots are also excellent business analytics tools because user-to-chat conversations can be analyzed automatically to understand customers' requirements better (Khoa, 2021).

Increase sales: Lo Presti et al. (2021) mentioned in their report that the intention to purchase can be obtained from interactive activities and the ability to transmit sound information to potential buyers. Chatbots can engage customers, guide them through the purchasing process, and increase sales conversations by providing instant assistance and product information. When these chatbots help customers find what they need instantly and efficiently, it would reduce cart abandonment rate and increase overall sales (Daud et al., 2024)

As much as these chatbots have benefits, they also have some challenges listed below.

Challenges of chatbots in online shopping

Personalization: Chatbots need support to generate customized responses that align with each customer's choices and past interactions. Most times, customers need clarifications on questions and irrelevant responses (Shumanov & Johnson, 2021). For example, a customer chats with online chatbots concerning a product on a Monday morning, and the chatbot gives information concerning the product. The customer then opens the same conversation later on the same day. To continue the conversation, the chatbot might need help to identify the customer and the previous interactions, which would result in a less personalized user experience.

Understanding customers' intentions: Chatbots find it challenging to understand customers' intentions, which directly impacts their ability to provide accurate and meaningful responses to customers. Another reason why these chatbots fail to understand customer intentions is their inability to provide convincing and engaging conversations and, lastly, their inability to hold long conversations (Kvale et al., 2019).

Maintain conversational flow: It is often tricky for chatbots to maintain a smooth conversation flow with users; this is because most of the chatbots in online shopping have limited abilities to respond to queries of customers that are not in their database, which leads to short conversations between the chatbot and customer. For example, if a customer has a unique inquiry which is outside the chatbot’s programming, the chatbot might provide irrelevant or confusing responses. It makes customers feel misunderstood and not valued, especially in situations that may require a smooth dialogue.

Fig 4. shows a presentation of an unsatisfied customer conversation with a chatbot. A customer asks about their order status, and the chatbot responds with a generic response indicating its limitations, leaving the customer unsatisfied and might require further assistance from a human representative. The arrows in the diagram represent the flow of the conversations.

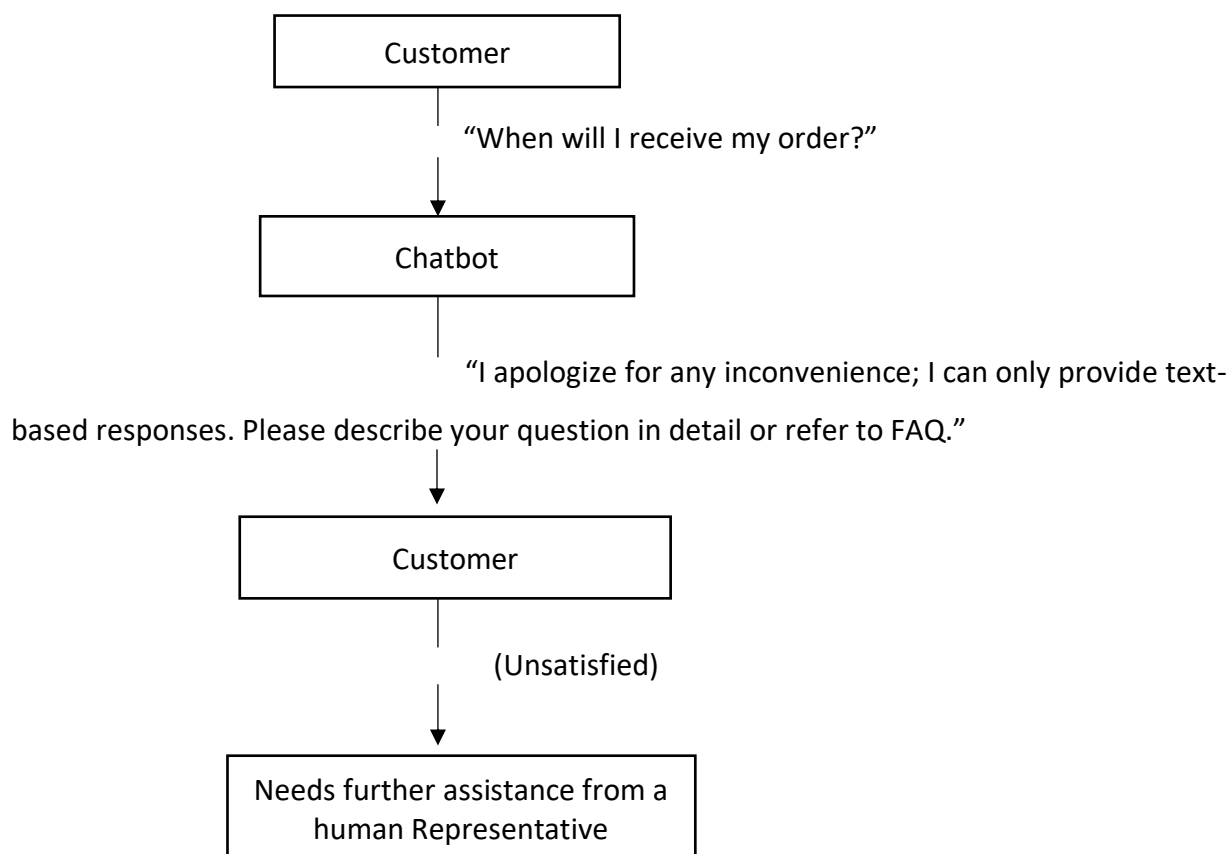


Figure 4 Interaction with customer and chatbot leading to a human assistance: (Author's own illustration)

Lack of emotional Intelligence: Chatbots in online shopping need help understanding and responding to human emotions. It does not feel customers’ frustration or understand their

problems emotionally; this would make customers feel less valued. Matini (2023) also mentioned in his report that the failure to identify emotions in online shopping chatbots could affect the extent of user engagement with these bots. A lack of empathy from online shopping chatbots can make users feel undervalued and drive them away from the platform. Song et al. (2021) emphasized that emotional intelligence in chatbots is significant for building user trust. When chatbots fail to interpret or respond to emotional gestures, the users might regard them as unreliable, which can reduce trust in the brand and reduce the chances of repeated purchases.

Fig 5. represents the explanation concerning the lack of emotional intelligence in chatbots used for online shopping and its effect on customer engagement. This diagram shows a clear and compelling flow, illustrating how the lack of understanding and responding to customer emotion can trigger a negative outcome, which results in customer loss.

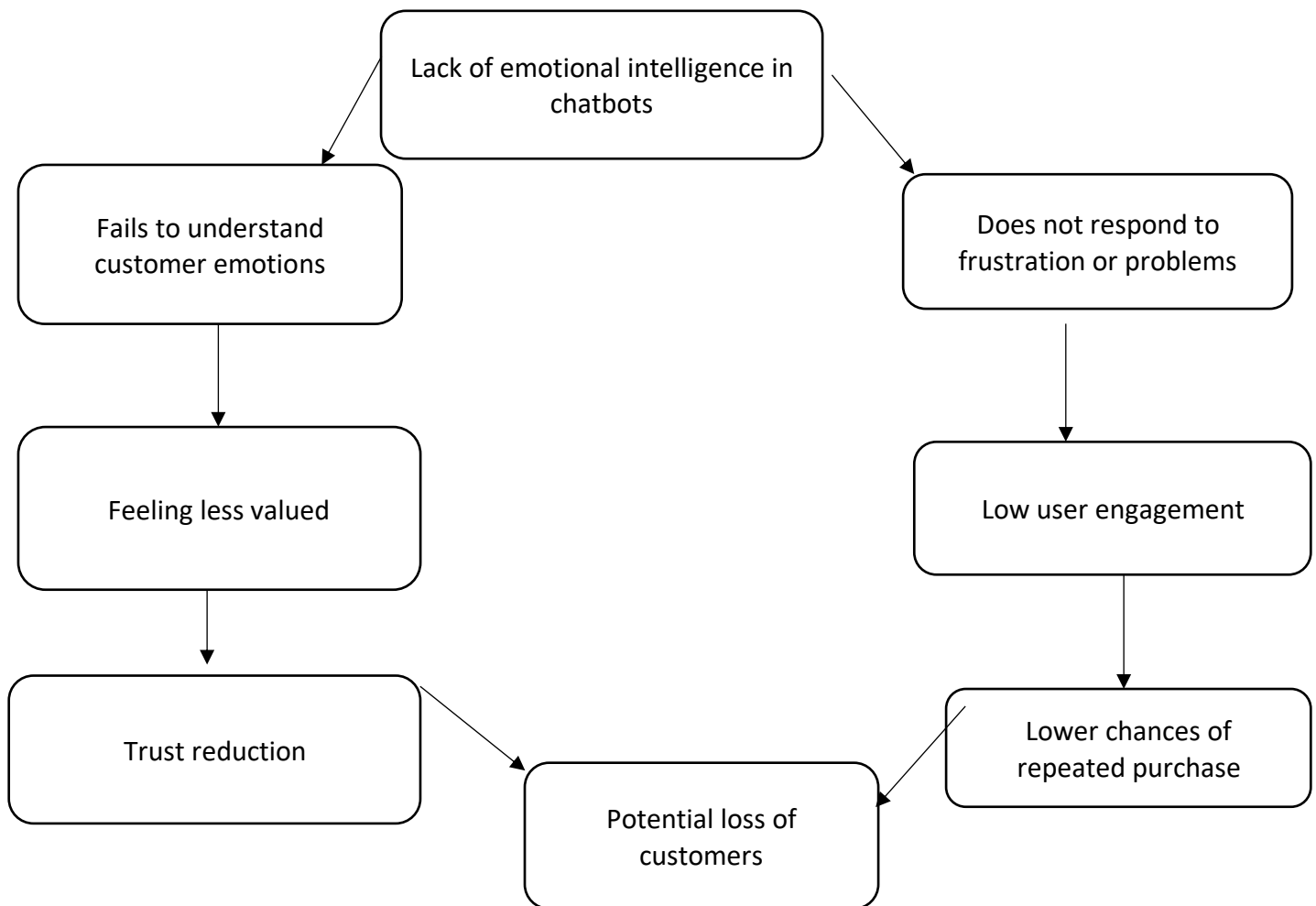


Figure 5 The influence of lack of emotional intelligence in chatbots in online shopping on customer experience: (Author's own illustration)

Privacy and security concerns: These issues are major obstacles in accepting chatbots in online shopping. Chatbots in online shopping often require access to customer's personal information to provide personalized services and facilitate transactions. Customers may not have complete awareness of how their data is utilized or stored by the chatbots; this lack of transparency will hurt customers' trust, especially if the customers feel that their data is being relayed to third parties without their consent. As noted by Lalar et al. (2024), insufficient clarity in the data management process can foster distrust among consumers, who may fear their data being exploited for malicious purposes or sold to their parties. Hasal et al. (2021) noted when a chatbot can access user's personal information, it is required to comply with the General Data Protection Regulation (GDPR).

2.1.3. Personalized Marketing

Personalized marketing refers to customizing marketing messages, offers, and experiences sent to different customers according to their preferences, purchase history, past interactions, and behaviors. AI-powered personalized marketing in online shopping has become a significant strategy for elevating customer satisfaction and maintaining competitiveness in the e-commerce market (Thakur et al.,2024). In online shopping, AI-driven personalization significantly enhances customer satisfaction by providing tailored product recommendations.

Fig 6 is a graphical presentation by (Vesanen, 2005) of how personalization is done through the use of customer, customer data, customer profile, and marketing output. The customer is the first stage of the personalization process; each customer has unique tastes, behaviors, and preferences that need to be addressed. Next, customer data which is obtained from purchase history, browsing behavior, feedback, and demographic information. Another significant point is the customer profile, representing the customer's identity, preferences, and insights. Lastly, marketing output which is obtained using the customer's profile to create personalized marketing output like; personalized ads, personalized emails and personalized product recommendation.

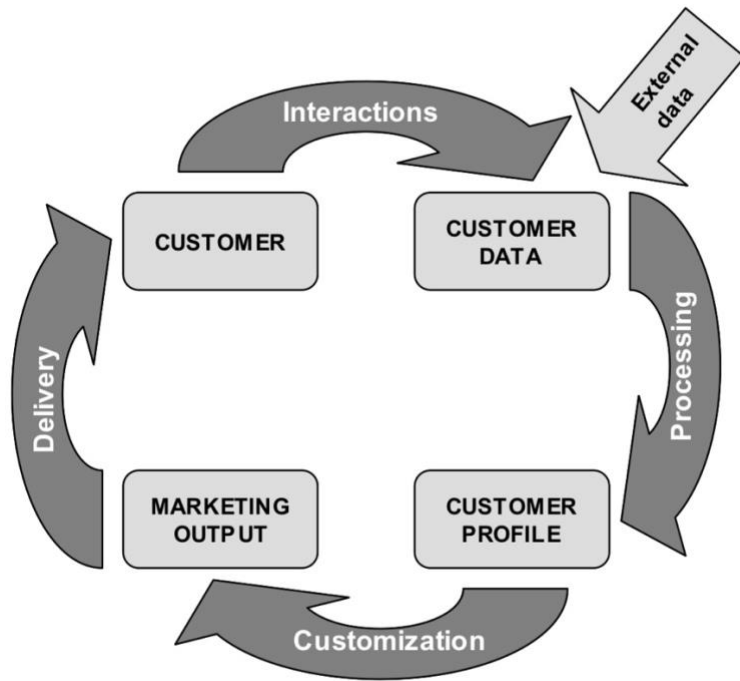


Figure 6 The process of personalization (Vesanen, 2005)

Benefits of personalized marketing in online shopping (to both customers and Businesses)

Increase customer engagement: Personalized marketing in online shopping significantly impacts customer engagement. By creating personalized suggestions and experiences, businesses that operate online will encourage customers to spend more and create a stronger connection to their brand (Potter & Olaoye, 2024). Promotions and offers that align with customer-specific needs or pain points tend to generate greater customer interest. Personalized marketing increases customer engagement through personalized emails, notifications and advertisement which will captivate customers, fostering engagement.

Higher conversion rates: Lzquierdo (2014) confirms that personalized marketing in online shopping can increase conversion rates by implementing personalized communication strategies such as targeted advertisement and product recommendations. Conversion rates increase when online businesses understand customer preferences and offer personalized promotions, increasing conversion rate and customer loyalty. For Instance, when a customer keeps receiving personalized ads and emails based on their past purchase history or preferences, they are more likely to find products that interest them. This increases the

chances of them clicking on the ads or emails guiding them to the online store, upon arrival, the sense of familiarity and alignment with their needs motivates them to complete a transaction, thereby elevating conversion rates. According to Li et al. (2024), the implementation of a tailored marketing strategy, as demonstrated by the BiLSTM -TabNeT, allows more accurate customer classification and segmentation, which is vital for effective personalized marketing.

Enhance customer insight: Online businesses can better understand customer insight with AI-driven personalized marketing, where the AI monitors and analyzes customers' behavior through their browsing history, past purchases, and queries; this continuous process would help online businesses build a comprehensive profile for each customer. Furthermore, with advanced analytics and machine learning, personalized marketing can uncover hidden trends in customer behavior that were not detected. For instance, it may disclose that a customer prefers shopping during weekends or is likely to buy luxurious products when they are at a discount, this is very helpful to online businesses as it gives more insight into the customers. Thakur et al. (2024) outlined that AI-powered personalized systems, such as those utilizing deep learning, can enable online business platforms to design intelligent recommendation systems that can predict the responses of future customers by understanding their individual preferences and behaviors, thereby enhancing the efficiency of decision making and increasing customer experience in online shopping.

Attracts millennials: Smith (2011) acknowledged in their research that millennials are the ingredients in the advancement of e-commerce. Personalized marketing is a power tool to attract millennials. A study conducted by Cherif and Bayarassou (2022) confirms that millennials value personalized advertising because it helps them discover new products and manage their time and finances. Personalized marketing aligns with millennials preferences by providing customized product recommendation, unique promotion based on their browsing history and contents that aligns with their lifestyles and values. Millennials are likely to show interest or interact with online businesses that prove they understand them individually, thus increases conversion rates and brand loyalty.

Increase customer loyalty: Integrating personalized marketing strategies in online shopping has increased customer loyalty significantly by aligning promotional content with customer preferences thus overcoming low advertisement rates (Lzquierdo, 2014). This approach would

be very effective, particularly in the Finnish online market, where consumers value efficiency and relevance in their online shopping experience. When online businesses can understand and predict customer behavior by providing them with relevant ads and product recommendations, they are most likely to repeat purchases, thus strengthening their connection with the brand and building customer loyalty. For instance, a customer regularly buys hair products from a store online, with the use of personalized marketing, the online store then sends this customer personalized product recommendations of products that aligns with their previous purchase, offering personalized discounts on them and including them in a loyalty program where points are obtained for every purchase, over time the customer will then feel that this online stores values their needs, thus increases customer loyalty and repeat purchase.

Challenges of personalized marketing in online shopping

Risk of over-personalization: Over-personalization in online shopping is a vital challenge of personalized marketing, as it could lead to customers feeling uncomfortable or manipulated, which can reduce engagement and marketing effectiveness. Pålman & Waldenskiöld (2013) acknowledged that over-personalization can make consumers have the feeling of being “stalked” since consumers perceive extreme data gathering and targeted marketing as an invasion of privacy; this perception can weaken consumer and company relationship rather than making it more robust, as personalized marketing intended. Consumers are very sensitive to the over-personalization of marketing messages; it is often seen as intrusive, thus leads to adverse consumer reactions. Bhushan (2018) recognized that if personalized marketing is excessive it may turn off customer.

Data privacy concerns: Issues regarding data privacy present a major difficulty for personalized marketing. This type of marketing heavily relies on the collection and examination of large volumes of consumer data to effectively refine its marketing tactics. Personalized marketing involves collecting extensive data that includes the users’ behavior, preferences, and interactions across multiple platforms. This data is essential for creating user profiles and executing successful marketing strategies (Duan, 2024). Nevertheless, the gathering and handling of this personal information can increase privacy risks, as they could result in the misuse of personal information and unauthorized access. A data breach would have a negative impact on businesses, resulting in legal penalties and causing customers to avoid the business

due to the fear of the safety of their private information making consumers feel unsafe. Arora (2023) highlighted in their research that online business platforms need to balance their personalized recommendations while ensuring data privacy to maintain customer trust.

Data quality and accuracy: Personalized marketing in online shopping relies on high-quality and accurate data. Data quality and accuracy are essential for personalized marketing. If the data collected needs to be corrected or better quality then it could lead to incorrect personalized recommendation thus reducing sales and interactions. Online businesses must guarantee that the data they gather is precise, and it is also essential to understand customer attitude and accurate choices to ensure a successful personalized marketing strategy. The research by Li et al. (2024), indicates that the success of customized marketing is significantly influenced by the accuracy of the algorithms used for data analysis. They went on to explain that even though advanced models like Bidirectional Long Short-Term Memory Networks (BiLSTM-TabNet) have shown an increase in accuracy, there is still a risk of customer classification and segmentation that could lead to ineffective personalized marketing.

2.1.4. Benefits of AI adoption in online shopping

Incorporating AI into online retail has significantly increased the customer shopping experience by offering customized services, improving the efficiency of operations, and ensuring secure transactions. Artificial intelligence technologies have significantly impacted online shopping, making customer's shopping experience more convenient, efficient and enjoyable. Outlined below are the key benefits I have explained of AI adoption in online shopping:

Artificial intelligence improves customer support and engagement through the use of AI-powered chatbot and virtual assistant, providing instant and accurate round-the-clock support to customers, solving their queries quickly and enhancing overall customer experience (Aggarwal et al., 2024).

Furthermore, artificial intelligence enables online businesses to offer customized product suggestions tailored to their clients' browsing and purchasing histories. Offering this service would enhance customer loyalty and satisfaction. Saleem and Naseem (2023) highlighted in

their case study that platforms that use AI to tailor user experience will significantly boost customer engagement and satisfaction.

Additionally, security remains a major concern in the domain of online shopping. Artificial intelligence helps in the identification and mitigation of fraudulent activities, thereby securing customer transactions. AI has the power to detect unusual activities in real-time. For instance, if a customer's account starts showing activities from different locations or signings from different devices, artificial intelligence will further review this action and inform the customers; sometimes, AI might even block the account temporarily until the case is verified. This process helps build customer trust, giving them a secure shopping experience. Zikry et al. (2024) noted that employing AI to secure shopping experiences will maintain customer engagement and build trust and satisfaction.

Moreover, Artificial intelligence enhances UI/UX by enabling personalized recommendations by analyzing customers' past purchases, purchase behavior, and browsing history to match customers' individual preferences. This will enhance user engagement by providing relevant product suggestions, thus improving customers' shopping experience (Vasantham et al., 2023).

Finally, artificial intelligence can enhance marketing strategies in online shopping by sending customers personalized ads, customized offers, and promotions. The adoption of artificial intelligence in online shopping allows businesses to modify their marketing strategies to match personalized customer preferences, enhance operations, and predict market trends. Utilizing advanced big data analytics powered by AI helps online shopping businesses to accurately anticipate trends and customize marketing strategies to meet customer preferences (Johnson et al., 2024).

2.2. Millennial consumer behavior in online shopping

The demographic known as millennials, often labelled as Generation Y, consist of individuals born during the period of 1981 to 1996. This generation is the first to have grown up with the internet and rapid technological advancement. They are known as "digital natives" due to their tech navy nature (Dharmesti et al., 2021). This generation was raised in an environment where technology deeply incorporates itself day-to-day life, including shopping. Ordun (2015) pointed out that millennials represent a distinct generational identity, as many of them believe that

their engagement with modern technology sets them apart from the previous generations. Millennials are familiar online platforms and mobile apps for their purchasing decisions.

The millennial generation values privacy, convenience, and customer-centric services. They are likely to conduct online research about a company's product, read online reviews from past consumers, and seek recommendations before purchasing. This generation aims for convenience, personalization, and instant satisfaction; they are known for valuing online businesses that match their social and ethical principles. Understanding the purchasing behavior of millennials in online shopping is vital for businesses functioning online, as millennials are often the major contributors to online sales and trends. This chapter will focus on explaining how millennials interact with online platforms and make purchasing decisions.

2.2.1. Characteristics of millennial consumers

- **Tech-savvy Individuals:** The millennial generation is known for its deep integration of technology, which significantly influences consumer behavior. Millennials spend much time online, specifically on social media platforms. These constant actions by millennials allow them to engage with online businesses, frequently evolving their perceptions (Fondevila-Gascón et al., 2021). The accelerated progress of technology throughout their developmental years has prompted millennials to use smartphones and online platforms for shopping as it is convenient and accessible to them. As noted earlier in this chapter, millennials will extend their efforts to conducting online research and reading reviews online before purchase which illustrates the degree to which they are digital native.
- **Social media influence:** Social media is a powerful instrument shaping millennial consumer behavior. Millennial consumers are significantly influenced by social media systems like ratings, reviews and recommendations on online frameworks. These systems encourage millennial consumer trust, which is essential for purchasing decisions. Interactive promotional strategies on social media are very efficient in influencing millennial consumers. These strategies enable businesses to apprehend the attention of millennials and meet their expectations. According to Barros et al. (2020), the continuous

communication and updates provided by social media platforms are vital in shaping the decision-making process of millennials.

- **Mobile-centric:** Due to millennials' early and prolonged disclosure of technology, they are characterized as mobile-centric. Millennials have been brought up in the era of technology, which makes them comfortable using mobile devices. The early exposure of millennials has led to their dependency on mobile devices for various aspects of their lives, like communication and shopping (Hahn & Kim, 2016). Millennials prefer to shop online using their smartphones since they are constantly connected to the internet. They look forward to online businesses that have mobile-friendly web pages, understanding these characteristics in vital for businesses functioning online aiming to engage with millennial consumers.
- **Loyalty and reviews:** Millennials are loyal to businesses that meet their expectation. This generation values personalization and instant satisfaction. They tend to engage with businesses through social media platforms, using digital word-of-mouth marketing and opinions of their peers when making buying decisions (Moreno et al., 2017). Millennials trust their peers more than they trust the business itself; they spend hours online searching for product reviews before purchasing. If positive reviews are gotten, it would stimulate their loyalty, but if negative reviews are gotten, it might stop millennials from making purchases.

2.2.2. Factors influencing millennial consumer online shopping behavior

Components that affect millennial online shopping patterns, are grouped below into several categories: Demographic factors, Psychological factors, technological factors, environmental factors, and marketing factors. If online businesses master these factors, they can modify their marketing approaches and shopping experience according to the preferences of millennial consumers.

Demographic factors

- Age: As mentioned in chapter two, millennials are tech-savvy. They were raised with the internet making them more comfortable shopping online. Sonia (2024) acknowledged in their research that millennials aged 18 to 30 are being influenced by their digital literacy and preference for comfort, which makes them more drawn to online shopping.
- Level of income: Income plays a vital role in determining millennials' purchasing power and their ability to engage in online shopping. Millennials with greater disposable income are often more inclined to shop online for luxury brands, while those with limited disposable income may prioritize promotions and discounts.
- Level of education: According to Wu (2024), education is a major indicator of online shopping behavior. When millennials have higher education levels, their online shopping activities tend to rise. They are more inclined to conduct online research about products and compare them other online options before purchase.

Psychological factors

- Social influence: The utilization of social media and peer reviews has significantly influenced millennials' online shopping behavior (Acheampong et al., 2016).
- Trust and security: Millennials value trust and security, leading them to prefer shopping from sources that they perceive as reliable and secure. As noted by Bashir et al. (2019), trust also includes online merchant's reliability and the transaction's security. This is an essential factor affecting millennial online shopping behavior.
- Convenience: The convenience of online shopping has significantly impacted millennials' online shopping behavior. They value the convenience and flexibility of online shopping, as they can shop from home at any time and with a variety of products available, thus significantly influences millennials' shopping habits.

Technological factors

- Mobile adaptation: Millennials are highly interactive with their mobile phones, and the majority of them prefer to shop online using their smartphones. Their use of mobile

devices enhances convenience and flexibility; it permits them to engage in shopping whenever and wherever they choose.

- **Social media integration:** Integrating social media into millennial shopping behavior is vital, as these platforms serve as a means for new product discovery, new brand discovery, and peer confirmation (Wilson et al., 2024).
- **Personalization:** Millennials are attracted to personalized experiences. Sending personalized emails and messages to millennials greatly influences their shopping behavior as they blend into customers' self-extension.

Environmental factors

Sustainability: Millennials value sustainability and are eco-conscious. Their buying intention is influenced significantly by their attitude towards sustainability and environmental knowledge. Research conducted by Ghouse et al. (2024) indicates that millennials with higher environmental consciousness are more likely to be aware of and purchase green products.

Shipping and Logistics: Environmental factors related to shipping and logistics significantly influence millennial shopping behavior. Millennials value fast and flexible shipping. They expect logistic capabilities like tracking shipped products, order accuracy, and order condition, which are vital for their online shopping behavior and purchase decisions.

Brand Values: Millennials highly prefer brands that aligns with their value. They also consider the reputation of the brand before making online purchases, thus influencing millennial online shopping behavior

Marketing factors

Influencer marketing is essential in determining the online purchasing habits of millennials. Social media influencers possess substantial impact over millennials' approaches to online shopping. Product promotion and recommendations made by these online influencers significantly influence millennials' purchasing behavior.

According to Chavda and Chauhan (2024), millennials are attracted to influencers that they find sincere and relatable, thus increasing trust and probability of purchase.

Furthermore, content marketing positively influences millennial behavior in online shopping. Millennials are attracted to knowledgeable and engaging online content, which enhances their shopping experience and influences their shopping decision (Fatihatul et al., 2023).

Additionally, Loyalty programs like discounts on repeated purchases highly motivate millennials to stay loyal. They prioritize promotions and are attracted to lower prices, thus demonstrating that discounts and offers are essential in shaping their online shopping behavior.

2.3. AI and millennial consumer behavior in online shopping

The utilization of AI in e-commerce platforms is massively shaping the purchasing habits of millennials. With artificial intelligence progressively revolutionizing the online shopping scene, understanding its influence on millennial consumer behavior becomes vital. This section will explore the essential aspects of this relationship.

2.3.1. How is artificial intelligence (AI) revolutionizing millennial online shopping

Personalized shopping experience: AI-powered technologies evaluate consumer information such as browsing trends and past purchases to enable tailored suggestions, which enhances customers' shopping experiences, making them more customized and convenient (Aggarwal et al., 2024). According to Thandekkatu and Kalaiarasi (2022), using AI to create personalized interfaces and dynamic pricing strategies enhances user experience, rendering online shopping more efficient and engaging for millennials. AI also facilitates functionality of virtual search, empowering users to locate products through the utilization of images. By examining image's feature, artificial intelligence can recommend visually comparable items from the inventory (Aggarwal et al., 2024). Millennials prioritize convenience and efficiency, AI features like chatbots provide instant support, answer all queries, and offer personalized shopping deals at any time without the intervention of human support, thereby improving the efficiency of

customer interactions and enhancing the comprehensive shopping experience (Areiqat et al., 2020).

Intelligent search and filter: The application of AI into e-commerce significantly transforms millennials' shopping experience by optimizing intelligent search and filters. These systems utilize advanced algorithms and machine learning methods to examine consumers behavior, choices, and search trends in order to provide fast and accurate search results. According to Aggarwal et al. (2024), AI-driven search and filter tools enable customers to locate products more efficiently by understanding and anticipating users' intentions. These tools can analyze natural language inquiries and deliver more appealing results to the customers' needs. The AI search algorithms, such as A*, are fundamental in effectively traversing vast product databases and enabling customers to find the best options among various products (Salhi, 2017). For instance, a customer types a query "women's running shoes," AI-driven smart search algorithm A* can predict and subsequently suggest Nike women's running shoes characterized by waterproof and breathable attributes, or it can also suggest shoes based on the past purchase of the customer, thus demonstrating the algorithm's proficiency in optimizing problem-solving and enhancing the overall shopping experience of millennials.

Dynamic pricing and discounts: Online retailers are significantly transforming millennial online shopping experience through dynamic pricing and discounts. This process is being fueled by the capacity of AI to examine extensive datasets, forecast consumer actions, and modify prices instantly, thus maximizing sales and enhancing customer satisfaction. As indicated by Markula (2023), AI-supported dynamic pricing is designed to frequently modify prices in response to market changes. These algorithms gather data from competing online stores and modify prices to optimize profit while reducing sales duration. AI algorithms in online shopping create customized shopping experiences through real-time analysis of customer preferences. These features allow online businesses to create personalized discounts and promotion, thus improving customers satisfaction and loyalty. Artificial intelligence can personalize prices following the customer's action or loyalty. For instance, regular buyers may have exclusive discounts.

Figure 7 below is a graphical representation of data derived from a research conducted by Chukwunweike et al. (2024). It illustrates the AI data collection sequence. It highlights six

essential steps: planning and need identification, design and preparation, quality assurance, storing the data, annotating the data, and process documentation, demonstrating that AI compiles customer information from browsing patterns, previous transaction, and other relevant customer interactors to enhance their accuracy and reliability.



Figure 7 AI sequence of data collection (Chukwunweike et al., 2024)

Enhance privacy and security: Millennial consumers value confidentiality and protection of their personal details. Artificial intelligence is profoundly enhancing the shopping journey for millennials shoppers by enhancing privacy and security. According to Solanas and Martnez-Ballesté (2009), AI algorithms like neural networks, fuzzy systems, and multi-agent systems are utilized to safeguard personal data in online shopping settings. These technologies protect personal data, guaranteeing that the privacy of millennials consumers is not compromised while striving for improved security protocols. AI technologies enable online business platforms to conduct data mining effectively, which can yield substantial profits if consumer trust was maintained through effective privacy protection measures (Wang et al., 2021).

2.3.2. Other potential drawbacks and millennial consumer concerns about AI

Algorithm bias: Algorithmic bias within artificial intelligence systems constitutes a significant concern, especially among millennial consumers who are increasingly conscious of technology's ethical implications. Findings reveal that bias can result to unjust treatment of individuals based on factors like gender, race, age, religion, nationality, and socioeconomic status, raising concerns about the fairness and accountability of decision-making driven by AI (Nazer et al., 2023). According to Rea (2020), algorithm bias in AI can result to unjust decision-making, which creates severe concerns among millennial consumers. Millennials, who prioritize fairness and transparency may lose trust in online businesses that rely on biased algorithms, potentially influencing their interaction with such technology.

Inaccurate recommendations: According to Menard and Bott (2024), the collection of user information into behavioral profiles for AI applications can result in inaccurate recommendations, which may irritate consumers, especially millennials who prioritize personalized experiences. These errors can arise from defective algorithms, which leads to suggestions that do not correspond to millennial individual preferences. Reliance on AI algorithms might overlook unique customer needs, resulting in a deficiency of variety in suggestions (Aggarwal et al., 2024). It could reduce the overall shopping experience, as millennials might sense that their uniqueness is not acknowledged, ultimately affecting their loyalty to the online business brand.

AI-driven FOMO (fear of missing out): As noted by Nasr et al. (2023), previous research indicates that FOMO increases impulse purchases, and impulse purchases leads to increased regret after transaction. AI-driven FOMO can intensify anxiety and stress levels of millennial consumers. The constant urge of millennial consumers to remain informed and engaged, driven by AI algorithms may contribute to mental health issues. Studies have shown that FOMO correlates with decreased cortical thickness in brain areas related to social cognition, suggesting a neurobiological foundation for psychological effects (Wang et al., 2023). Furthermore, Puri et al. (2024) acknowledged that AI-powered FOMO issues arise from manipulating consumer emotions through targeted advertisement, which can compromise authentic experience and individual preferences. Moreover, the dependency on AI may reduce individual choice-making, as consumers may feel pressured to align with social trends instead

of making independent decisions. This situation can lead to feelings of dissatisfaction, ultimately affecting online business brand loyalty and millennial consumer wellbeing over time.

Inadequate control and choice limitation: The incorporation of AI in online shopping has raised significant concerns regarding control and choice limitation, especially among millennial consumers. AI-powered algorithms, particularly those used in pricing and recommendation, often present millennials with products they are most inclined to buy. They can influence millennial consumers' decisions by employing "dark patterns" that diminish their freedom selection (de Marcellis-Warin et al., 2022). The constraints imposed by this algorithmic discovery diminish the opportunity to enhance the shopping experience. According to Paterson (2022), the impact of these technologies is particularly noticeable in consumers engagement with digital platforms and personalized advertisement; however, they are also affecting the fundamental decision-making approaches that consumers utilize when purchasing. Millennials might perceive this algorithm as limiting rather than beneficial, sensing that their preferences are controlled by AI rather than their own free will decision.

2.4. AI and millennial online shopping in Finland

2.4.1. AI landscape in the Finnish e-commerce market

The Finnish e-commerce environment is witnessing a considerable advancement through the infusion of AI, which is enriching numerous dimensions of the online shopping experience. AI technologies are utilized to enhance consumer engagement, tailor shopping experience, and streamline operational processes, consequently fostering growth and efficiency within the industry. In a comprehensive analysis conducted by Statista Finland, Clausnitzer (2024) articulated that prevalence of online shopping was most pronounced among individuals within the age between 25 and 34 years, attaining a rate of 80%. The e-commerce in Finland is on a verge of considerable expansion, propelled by advancements in digital technology and creative strategies.

Key contributors and initiators in Finland's e-commerce market

Millennial shoppers and consumers: Finnish millennials are essential in facilitating the adoption of AI within online retail industry. They desire tailored experiences, easy access, and eco-friendliness, compelling online retailers to implement AI innovations such as recommendation algorithms, advanced search functionalities, and AI-enhanced customer support. Technological advancements significantly influence millennials in Finland, who favor online shopping for its convenience, diverse options, and the ease of price comparison (Kivivouri & Tamminen, 2022).

Finnish AI accelerator (FAIA): According to Linden and Dyster (2022), the Finnish AI accelerator (FAIA) is a vital initiative supporting the growth of AI in Finland, with more than 1,250 companies utilizing a variety of AI applications and approximately 750 engaged in developing their own technologies. FAIA encourages collaboration among stakeholders to advance the development of language-centric AI. Furthermore, the national AI strategy launched in 2020 aims to integrate AI and digital technologies into businesses, thus fostering a robust ecosystem for innovation and growth in the Finnish e-commerce domain.

Finnish centre for artificial intelligence (FCAI): This is pivotal initiative in promoting AI technologies and applications across various sectors in Finland. According to Finnish centre for artificial intelligence (n.d.), it constitutes a specialist that amalgamates leading experts with the objective of addressing practical challenges through the application of both established and innovative artificial intelligence methodologies.

AI adoption in the Finnish e-commerce market

Chatbots and virtual assistance: A growing number of companies in Finland operating digitally are increasingly integrating these AI features to augment customer service and refine the shopping experience. According to Waghambare et al. (2023), the adoption of chatbots within marketing frameworks facilitates the sustenance of customer engagement and loyalty for online businesses, especially during disruptions like the COVID-19 pandemic, by effectively bridging the communication divide between companies and the consumers, a tendency also observable in the Finnish online shopping. Linden and Dyster (2022) similarly pointed out that the global COVID-19 outbreak has triggered an urgent demand for effective e-commerce platforms and digital services in Finland.

Predictive analytics: Finnish businesses engaged online are employing predictive analytics to anticipate customer demand, enhance inventory management, and refine supply chain adoption. Predictive analytics significantly improves the precision of demand forecasting, which is essential for businesses functioning online to satisfy customer needs. As noted by Kylie et al. (20204), techniques like long short-term memory (LSTM) networks and variational autoencoders (VAE) have demonstrated promising outcomes in uncovering hidden features and trends, thus enhancing forecast accuracy.

AI-powered automated marketing: Finnish e-commerce businesses are utilizing AI-driven automated marketing to enhance marketing initiatives, boost customer interactions, and elevate conversion rates. Wilson et al. (2024) emphasizes that AI technologies, including machine learning and predictive analytics, are essential for Finnish e-commerce companies in automating marketing efforts.

Challenges in AI adoption in Finnish e-commerce market

Absence of legislation tailored for AI: Finland currently needs more dedicated laws regulating the implementation of AI, resulting in ambiguity for businesses seeking to implement AI technologies. Research by Judge et al. (2024) shows that artificial intelligence systems, especially those using deep learning methodologies, demonstrate behaviors that are not easily predictable and auditable, making the regulatory process more challenging. Traditional regulatory frameworks may not be suitable, requiring the development of new structures capable of accommodating AI's distinct features.

Public trust and endorsement: Strengthening the public trust and endorsement of artificial intelligence technologies, particularly the millennial's trust in Finnish e-commerce, as it is important in domains like decision-making and personalized marketing. Trust in AI is frequently associated with their perceived mechanical rather than cognitive or social ability. It implies that Finnish consumers, especially millennials might be more open to AI in positions that are regarded as boosting efficiency rather than substituting human judgment or interaction (Oh & Jung, 2023).

Initiatives to mitigate these challenges

Government initiatives: According to the European Commission (2021), the Finnish government has introduced programs like the 4.0 initiative to foster the advancement and implementation of AI technologies across diverse sectors, including e-commerce. The AI 4.0 program pinpoints goals and metrics to enhance Finland's digital transformation.

Collaboration of industries: Partnerships among Finnish e-commerce companies, research organizations, and AI start-ups can effectively overcome difficulties and encourage the advancement of AI technologies throughout Finland.

2.5. Summary of literature review

This research investigates how artificial intelligence affect the shopping behaviors of millennials within the online shopping environment, with a specific emphasis on Finland. This study explores the extensive incorporation of AI technologies within the domain of e-commerce, specifically focusing on its contribution to personalizing millennial consumer shopping experience, optimizing customer service operation, providing enhanced and more convenient purchasing interactions. The literature review commences by analyzing the adoption of artificial intelligence in online shopping, outlining different types of AI technologies offers such as personalized product recommendation systems, chatbots, and personalized marketing. The importance of AI in revolutionizing the online shopping experience of millennials is highlighted as an essential element fostering millennial consumer satisfaction and loyalty.

Millennials, recognized for their tech-savvy nature and preference for convenience, are profoundly impacted by the advancements in artificial intelligence technologies. This literature review delves into the demographic, psychological, technological, environmental, and marketing elements that shape the online shopping habits of millennial consumers. Furthermore, research indicates that the notable influence of AI on millennial consumer behavior, especially through AI-driven product recommendation and personalized advertisement. Nikiforov (2023) conducted research that confirms millennials value personalized advertisement; it helps them manage time and finances and discover new products.

Nevertheless, Millennials value privacy and security of their data. Concerns regarding privacy, security, and ethical utilization of their data have emerged as a possible disadvantage of implementing AI.

Moreover, Within the scope of the Finnish online retail market, the incorporation of artificial intelligence is recognized as an effective trend that fuels innovation. Finnish online shopping businesses use AI to enhance personalized shopping experiences and predict analytics. However, they encounter obstacles like the absence of legislation tailored for AI, public trust, and endorsement. This literature review concludes that, although AI presents a multitude of advantages to both online businesses and millennial consumers, for it to be successfully implemented, it requires thoughtful consideration of ethical and trust-related factors regarding consumers, specifically millennials.

In general, artificial intelligence (AI) is significantly transforming e-commerce, especially how it affects the online shopping practices of millennials. However, continuous innovation and adherence to ethical principles are imperative for the lasting effect of AI.

3 Research methods and implementations

This section describes the research framework employed to explore the effect of AI in shaping millennial consumer behavior in Finland's online shopping. It commences with an overview of the overarching research design, then moves on to a detailed explanation of the data gathering technique, data analysis, and ethical considerations. Due to the intricate dynamics of consumer habit and rapidly evolving landscape of AI in online shopping, a qualitative strategy is adopted to gain detailed insights into the experience and viewpoint of millennial consumers. This methodology will support an in-depth understanding of how AI impacts decision-making, purchases, and overall customer satisfaction.

3.1. Research design

This framework constitutes a fundamental aspect of any academic investigation, establishing the groundwork for the methodological approach employed in the research process and

addressing the research questions. In the context of this thesis, which examines the influence of AI on the shopping behaviors of millennials in Finland, the study design adheres to the framework of research onion, as described by Saunders et al. (2009). This model presents a systematic approach for designing research by steering the researcher through various layers, ranging from philosophical beliefs to detailed data gathering and analysis techniques. The structure of the research onion is involves six distinct layers: research philosophy, research approach, methodological choice, research strategy, time horizon, and data collection techniques (Saunders et al., 2009).

For this research, a qualitative methodology has been employed as it facilitates a profound comprehension of how millennials residing in Finland conceptualize and engage with artificial intelligence within the field of online shopping. This chapter will elucidate each component of the research onion in correlation with the research design relevant to this study, thereby offering a thorough justification for the selections made in the methodology formulation.

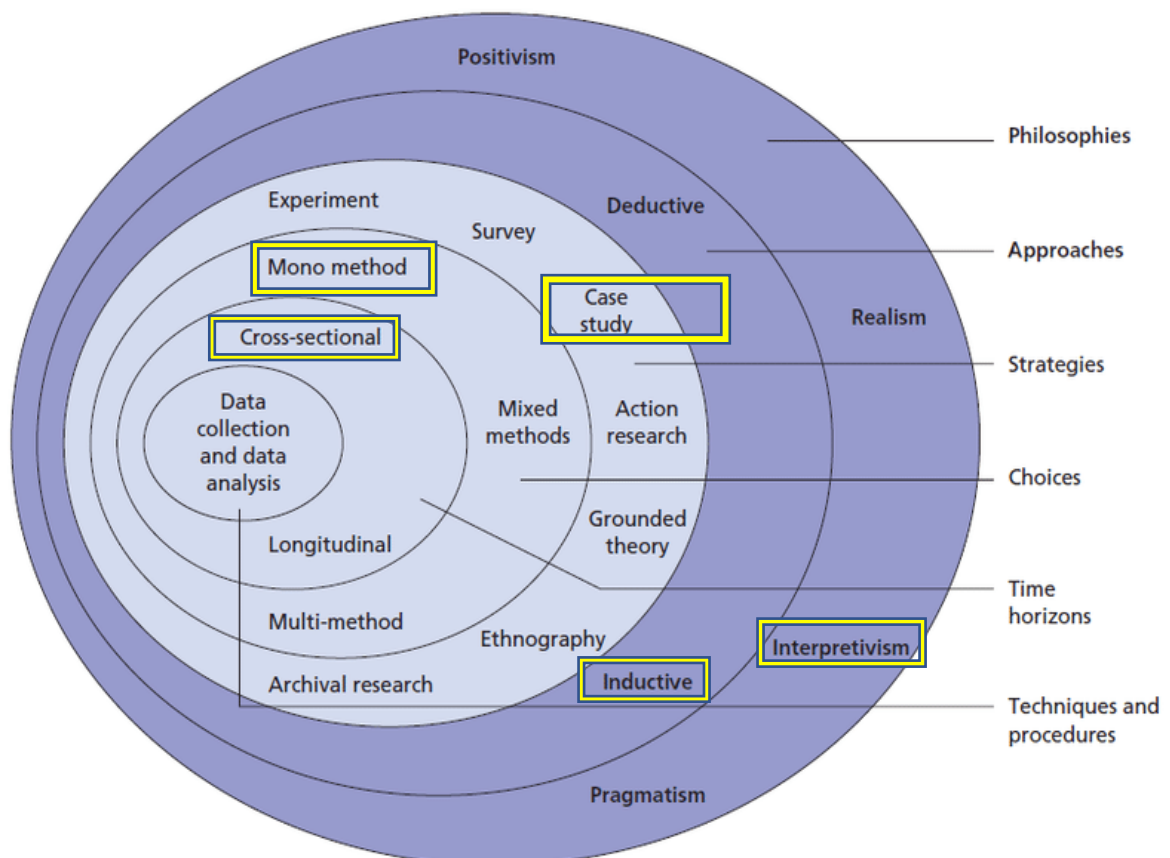


Figure 8 Onion research design (Saunders et al., 2009, p. 108)

3.1.1. Research philosophy

The philosophy approached selected for this research is interpretivism. Interpretivism represents a qualitative research philosophy that prioritizes the comprehension of meanings and experiences of individuals within a particular context. This methodology is pertinent to the current research, which explores the impact of AI on the behaviors of millennials in Finland. Interpretivism aims to comprehend individuals' subjective significances and experiences within their social frameworks.

This research aims to attain profound comprehension of how millennials view and interact with AI technologies during online shopping. Adopting an interpretive approach makes it feasible for the researcher to analyze the individual experiences, incentives, and behaviors of participants. By conducting face-to-face interviews, the researcher utilizes a technique that perfectly aligns with interpretivism, enabling the acquisition of comprehensive and intricate data directly from the participants' own views.

In this framework, the experience and understanding of AI in online can differ among participants. The responsibility of the researcher is to interpret these experiences, acknowledging the distinct meanings that participants associate with their behavior and interactions with AI while also recognizing the of the researcher's own viewpoint during the research process.

3.1.2. Research Purpose

The objective of this research motivates the researcher to employ an exploratory research approach, as the aim is to examine new phenomena and trends within the framework of AI-driven consumer behavior. The exploratory approach of this research facilitates the acquisition of extensive qualitative data through direct interview, which assist in uncovering patterns and themes that could enhance the understanding of AI impact on the online shopping experiences of millennials in Finland.

Given the researcher's emphasis on exploring the dynamics between humans and emerging technologies, the priority is to understand of how AI shapes perceptions and interactions, influencing millennials' buying decisions in Finland.

3.1.3. Research approach

The methodological strategy embraced by the researcher is inductive. Within this structure, the study intends to establish theories and insights derived from the data gathered, instead of verifying pre-existing hypotheses or theories, which defines the deductive method.

Acknowledging the objective of this study, to examine the impact of AI on millennial online shopping behaviors through face-to-face interviews, this study aims to reveal patterns and insights that emerged from the gathered data. This approach is relevant for this research because the researcher is determined to reveal new trends and insights that have not been comprehensively acknowledged before.

Also, the inductive approach enhances the qualitative aspect of this research, it prioritizes the collection of comprehensive and detailed data for analysis, with the intent to develop new frameworks and theories related to AI technologies and millennial consumer behavior in Finland. With the utilization of this approach, flexibility and adaptability are maintained throughout this research, ensuring that the conclusions are reliably dependent on the participants' experiences.

3.1.4. Research strategy/method/s

Research methodologies and strategies are essential elements to academic research, guiding the procedures of data gathering, analysis, and interpretation. These strategies are shaped in accordance with the objectives of the research and characteristics of the research topic. As noted by Saunders et al. (2009), the most significant consideration when selecting a research strategy is effectively addressing the objectives and questions of the research.

This thesis adopts a research strategy based on the case study method, which aligns with the qualitative approach of this study. The researcher intends to conduct face-to-face interviews to gather in-depth and detailed participants insights. Furthermore, this methodology will enable the interviews to reveal the complexities of millennial behavior about AI technologies. The data

acquired in this research will be analyzed rigorously with NVivo 12 to uncover the trends and motifs that align with this research's objective.

3.1.5. Methodological choice

The methodological approach applied in this thesis is mono method. The method involves using a singular research technique, specifically qualitative research, implying that data will be obtained using one type of qualitative data collection method, mainly through the face-to-face interview method and analyzed using NVivo. This approach is beneficial to this research, as the research aims to explore the perspectives and experiences of a particular demographic of millennials in Finland. In addition, the mono method enables this researcher to uphold clarity in both data gathering and analysis, thereby ensuring that results remain consistent with the interpretive research philosophy supporting this research.

3.1.6. Time horizon

This study adheres to a cross-sectional framework. According Saunders et al. (2009) cross-sectional research involves collecting data from a specific demographic within a specific timeframe. This approach is essential for this research, as it seeks to assess the immediate effect of AI on the purchasing behavior of millennial in Finnis online shopping environment. This methodology enables the retrieval of data from interviews that reflects the current experience and perspective of the participants.

3.2. Data collection

The insight for this study were acquired through face-to-face interviews to obtain a comprehensive understanding of millennial consumers' behaviors regarding AI technologies when shopping online. Overall, ten interviews were conducted ensuring an equal representation of genders: five men and five women who were all millennials living in Finland. These interviews were held in person or on Zoom, depending on the participants' schedules and preferences.

This methodology facilitated a flexible questioning approach, prompting participants to candidly express their experiences and viewpoints. The combination of 11 carefully structured

and open-ended questions enriched the insights gathered. The data derived from these interviews is anticipated to offer a balanced viewpoint on the impact of AI on consumer behavior in Finland's online shopping.

Variable/Theme	Interview question	Purpose/Focus
Encounter with AI technologies	1. Can you describe a recent experience where you encountered AI technologies like personalized recommendations, chatbots, or virtual assistants while shopping online? what was the experience like?	Explore participants' direct experiences with AI in online shopping
Interaction dynamics with AI	2. When you shop online, in what ways do AI technologies like personalized recommendations, chatbots, or virtual assistants typically interact with you and how do you usually respond to these features?	Understanding how participants interact with these features and their usual reactions to these interactions.
Influence of AI on shopping behavior	3. How do AI technologies like personalized recommendations, chatbots, or virtual assistants influence your shopping behavior or decision making?	Examine how AI influences participants' purchasing decisions and shopping behaviors.
AI-powered purchases	4. Have you ever made a purchase based on AI-driven recommendations or suggestions? Can you provide an example?	Analyze situations where AI directly influenced the purchasing decision of participants.

Trust in AI technologies	5. How much do you trust AI technologies regarding privacy and data security when shopping online?	Participants' trust in the privacy and security of AI technologies.
Privacy concerns	6. Have any other privacy concerns affected your use of AI tools in online shopping? If yes, what concerns specifically, and how have they impacted your behaviour?	Specific privacy concerns that have impacted participants' AI usage in online shopping.
Risk management	7. How have you mitigated or managed privacy risk related to AI-enhanced online shopping?	Measures taken by participants to address privacy risk related to AI.
AI's influence on shopping experience	8. How do AI driven features like chatbots affect your online shopping experience (for example; convenience, ease of use, or frustration)?	Evaluate how participants perceive the impact of AI on ease or challenges of shopping online.
Usefulness and hindrance of AI	9. Do you find these features helpful, or do they sometimes hinder your shopping experience? please explain.	Assess the recognized advantages and drawbacks of AI features in online shopping.
Future of AI in online shopping	10. What are your thoughts on the future of AI in online shopping?	Explore participant expectation and belief towards the development of AI in online shopping.
Expectations and concerns of AI	11. What expectations or concerns do you have regarding the further integration of AI into your shopping experience?	Examine participant anticipation and retainment concerning AI's future integration into online shopping.

Table 3: Interview questions design

3.3. Data analysis

3.3.1. Qualitative data analysis

The goal of this research data examination is to explore and interpret the feedback obtained from face-to-face interviews with millennials in Finland. To examine the qualitative data gathered from the interviews, the researcher created a codebook to organize and interpret recurrent themes and insights systematically. Furthermore, the employment of NVivo software is needed to

thoroughly execute this codebook on the transcript, which facilitates a comprehensive analysis and further enhancement of identified themes. The table illustrated below shows the initial codebook, which will direct the upcoming phases of the data analysis.

Codes name	<i>Definition</i>	<i>Example</i>	<i>When to apply</i>	<i>When not to apply</i>
AI engagement	Description of encounters and engagement with AI technologies, encompassing chatbots, recommendation systems, and virtual assistants.	"I recently visited a website that recommended products based on my browsing history and interacted with a chatbot."	Apply when participants narrate specific encounters and their interactions with different AI functionalities during shopping.	Does not apply when talking about experiences that do not involve AI technologies.
AI impact on online shopping.	The influence of AI technologies on consumer shopping behavior, including decision making processes and scenarios where purchases were influenced by AI.	"AI suggestions frequently prompt me to purchase products I didn't consider, such as the shoes I acquired after	When participants converse about the influence of AI on their shopping decisions, behaviors, or	Does not apply when participants discuss changes in their behavior not influenced by AI.

		encountering their suggestion.”	specific purchases.	
Privacy and trust management	Concerns, trust, and actions of participants regarding privacy and data security associated with AI technologies in online shopping.	“I have concerns regarding how much personal information that is gathered, and I frequently delete my cookies or utilize incognito mode to handle my data.”	When participants express their worries about privacy, trust issues, or they measure they take to mitigate privacy risks.	Does not apply when engaging in conversations about trust or privacy matters that are unrelated to AI technologies.
Chatbot and AI features experiences	The impact of chatbots and other AI features on the online shopping experience encompassing the perceptions of helpfulness or hindrance.	“Although chatbots assist me in locating products swiftly, they can be frustrating when they fail to address my inquiries.”	When participants describe specific AI features (notably chatbots) and evaluate their effectiveness.	Does not apply when discussing about online shopping experience that does not involve AI features or chatbots.
Future expectation for AI	Participants’ perspectives, anticipations, and apprehensions regarding the further integration of AI in online shopping.	“I am positive that AI will make online shopping even more personalized but however, I worry	When participants speculate about the further advancement of AI technologies	Does not apply when participants concentrate exclusively on existing AI

		about the usage and safety of my data.”	and express their aspirations or concerns regarding the growth of AI.	features without considering feature consequences.
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Table 4: Code book for interview data analysis

3.4. Ethical considerations

Dubey et al. (2024) emphasized that ethical consideration involves addressing concerns such as data privacy, informed consent, algorithmic bias, and transparency. While conducting this research, ethical considerations were prioritized to uphold the study’s integrity while ensuring the participants’ well-being. Before their participation, the researcher obtained consent from each participant, clearly outlining the objective of study, processes involved, and assurance of withdrawal at any moment without facing any adverse outcomes. The consent procedure was essential in fostering transparency and trust with the participants. The researcher ensured that the confidentiality and anonymity of every participant was maintained and no identifiable information was gathered or linked to participant responses. Thus, ensuring that the data remained anonymous and secure. Furthermore, all data obtained was preserved in a setting only the researcher could access. After the completion and final approval of this study, we will ensure the secure disposal of the research data to uphold participants confidentiality.

Additionally, the researcher ensured the voluntary participation of participants throughout. Before each interview, the researcher enlightened the participants about the purpose of the study, which was to examine the influences AI on the online shopping habits of millennials, particularly in Finland.

4 Research results

This section discusses on the insights drawn from the investigation, which centered on understanding the role of artificial intelligence (AI) on the online shopping behavior of

millennials, notably in Finland. The outcomes derived from these findings are categorized according to key themes that emerged from qualitative data analysis conducted with NVivo 12 Plus software. Each node indicates a distinct aspect of the participants' experiences and perceptions regarding AI technologies in online shopping. Accompanying each node are visual mind maps offering a structured overview and interview insights.

In the subsections below, the researcher will discuss each node in detail, using evidence from the interviews to support the findings and offer a thorough insights into artificial intelligence influence on the online shopping experiences among millennials in Finland.

4.1. AI engagement

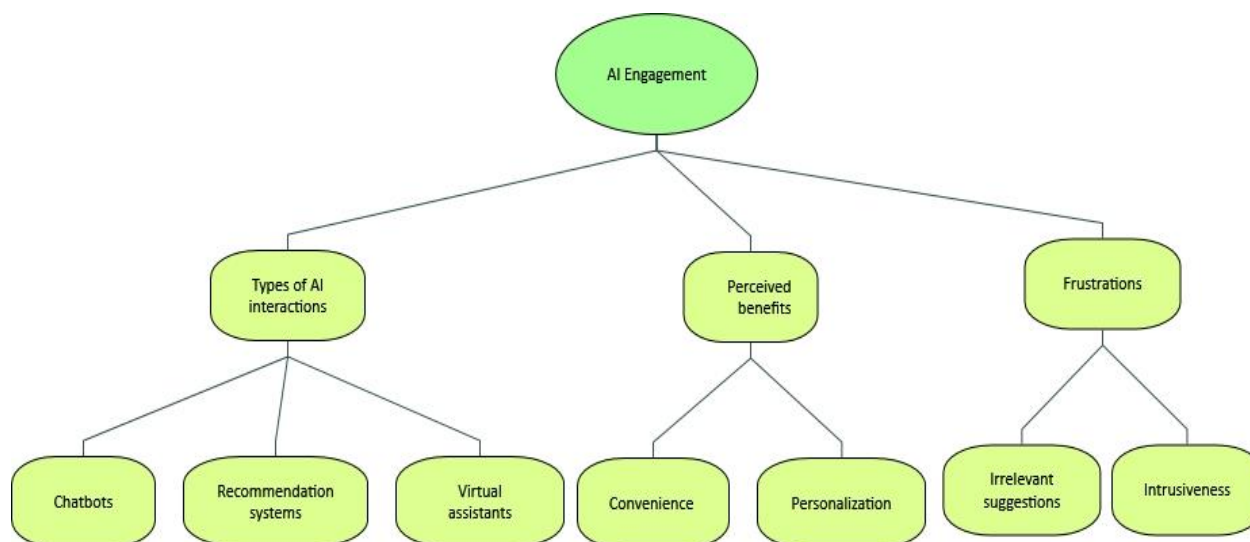


Figure 9 Mind map created in NVivo 12 Plus representing AI engagement - qualitative data analysis tool

AI engagement mainly involved the participants' interactions with chatbots, recommendation systems, and virtual assistants while shopping online. The researcher observed that chatbots were extensively used for customer support, with the participants expressing both convenience and occasional frustrations regarding the chatbots' ability to comprehend inquiries. Recommendation systems were commonly encountered and valued for their ability to suggest relevant products, such as complementary accessories for items recently purchased. Virtual

assistants were mentioned by participants less frequently but were recognized for their usefulness in delivering product information.

Participants pinpointed convenience and personalization as the main advantages of AI engagement. They outlined that AI technologies streamlined their shopping experience by minimizing search time, as the recommendation systems often corresponded with their needs or previous purchases. Most participants found these tailored recommendations beneficial, as they enhanced their purchasing experience by making it feel more customized.

Nevertheless, the researcher found that AI engagement also resulted in some frustrations, particularly with irrelevant or too intrusive suggestions, as participants disclosed feeling interrupted by pop-ups and recommendations that failed to align with their interests, making the AI appear less precise. The persistent appearance of these suggestions was sometimes viewed as intrusive, which fostered a sense of pressure instead of support.

In summary, the researcher observed that while AI engagement typically improved online shopping by providing personalized and convenient interactions, the inconsistency in recommendations and intrusiveness of some AI features underlines areas that require enhancement. Achieving a balance between personalization and user choice is vital for sustaining a positive experience and fostering consumer trust.

4.2. AI impact on online shopping

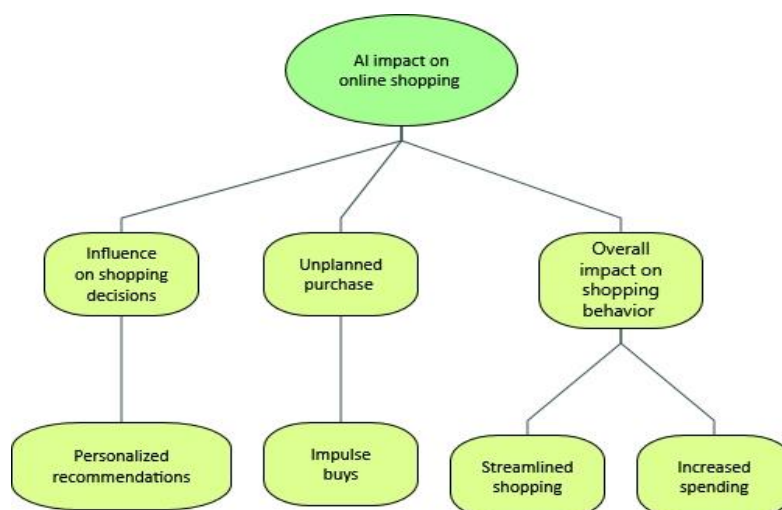


Figure 10 Mind map created in NVivo 12 Plus representing AI impact on online shopping - qualitative data analysis tool

The results obtained from this node highlight how AI-driven features influence consumers' shopping decisions and unplanned purchases, altering overall shopping behaviors. The experiences shared by participants demonstrated a mix of both beneficial and detrimental impacts of AI on their online shopping behavior. Participants noted that AI technologies, especially recommendation systems, frequently influenced their purchasing decisions by presenting them with products they might not have discovered independently. Many participants articulated that these recommendations were beneficial, as they simplified the decision-making process by showcasing relevant items.

The researcher learnt that AI recommendation also prompted unplanned purchases, as participants occasionally purchased items they had not initially planned to buy. Several participants noted that encountering related or complementary items motivated them to make impulsive buys. For example, one of the participants described how an AI recommendation led them to purchase a phone accessory they had not previously considered. Although these purchases were typically minor, participants admitted that AI recommendations sometimes led them to spend more than planned.

Overall, the researcher observed that AI was a tool for streamlining and improve the shopping experience by minimizing the time needed to search for products and facilitating consumers' ability to discover relevant items. Many participants valued the convenience of personalized recommendations and acknowledged how AI-driven shopping disregarded the need to search through multiple web pages. However, the researcher observed that some participants expressed concerns that AI's impact on shopping behaviors could sometimes feel overwhelming, leading to unplanned purchases. Furthermore, when recommendations were incorrect or overly persistent, participants reported annoyance, feeling that AI could occasionally disrupt their intended shopping track.

The researcher identified that AI's impact on online shopping nodes indicates that AI technologies affect consumer behavior by simplifying the shopping experience and prompting

unexpected purchases. Participants expressed appreciation for how AI-enhanced their search experience with relevant recommendations, although some mentioned it led to unintended expenditures. Overall, AI is a valuable tool for its convenience, despite some slight frustration when recommendations did not meet user expectations.

4.3. Privacy and trust management

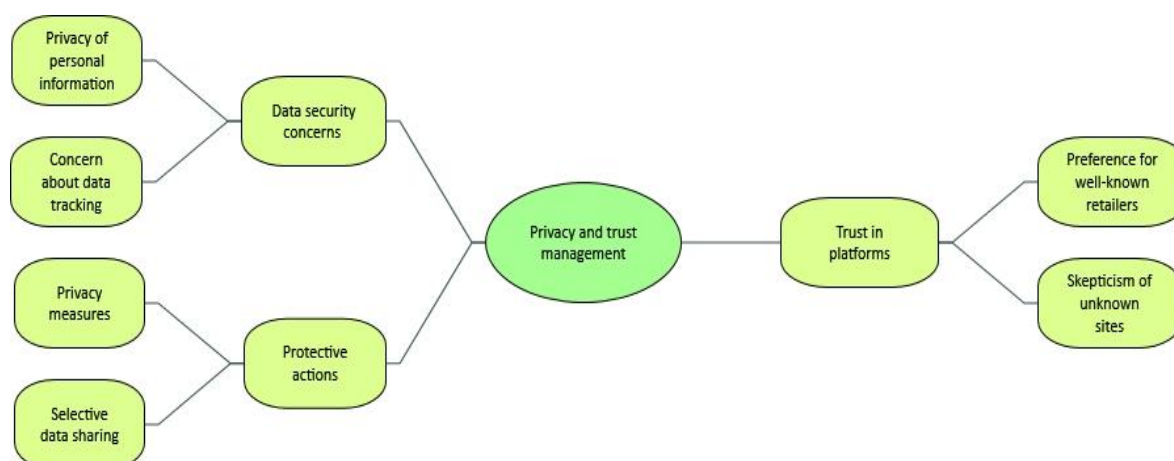


Figure 11 Mind map created in NVivo 12 Plus representing privacy and trust management - qualitative data analysis tool

The node privacy and trust management reflect participants' worries regarding data privacy, their trust levels in AI-enhance shopping platforms, and measures taken by them to safeguard their personal information. Insight from the interviews indicates that although some participants value the convenience provided by AI, they need to be more cautious concerning the collection and usage of their data. Many participants revealed their concerns about the safety of their data when engaging in online shopping. A recurring concern was the hesitation to share sensitive details, such as payment information, with AI-integrated platforms. One participant mentioned feeling discomfort regarding data tracking, remarking that products they had only briefly mentioned or contemplated seemed to appear in online advertisements, which raised concerns of privacy encroachment. This feeling of being "constantly tracked" was a widespread concern, leading some participants to be cautious about the degree to which AI systems observed and utilized their data.

The researcher noticed that the platform's trustworthiness significantly affected participants' comfort levels with AI features. Several participants noted greater ease when using AI-driven features on a well-known established platform, where they believed more robust data protection protocols were in place. In contrast, they expressed hesitation about engaging with AI on less recognized or smaller websites due to fears regarding data security. For instance, a participant remarked that they provided essential information on trusted sites and refrained from disclosing details that felt "overly personal" on unexposed online platforms.

Participants frequently undertook specific measures to safeguard their data while shopping online to mitigate privacy risk. These measures included utilizing private browsing modes, restricting applications permissions, and opting for one-time or virtual cards to protect their browser history and cookies. Another participant also mentioned employing ad blockers to diminish tracking. The researcher realized that these proactive steps by participants illustrated a cautious mindset, emphasizing that even though participants engaged with AI technologies, they remained vigilant about protecting their personal data.

Overall, the researcher observed that participants demonstrated a cautious engagement with AI in online shopping and appreciation of the convenience it offers while expressing their concerns regarding data privacy. They exhibit an elevated sense of assurance in AI features on established platforms but are reluctant to disclose personal information on a less reputable website. To manage privacy risk, participants employed protective measures, which the researcher mentioned in the previous paragraph. This measure indicates a need for enhanced transparency concerning data usage to foster trust and make users feel more secure regarding AI-driven shopping technologies.

4.4. Chatbots and AI features experience

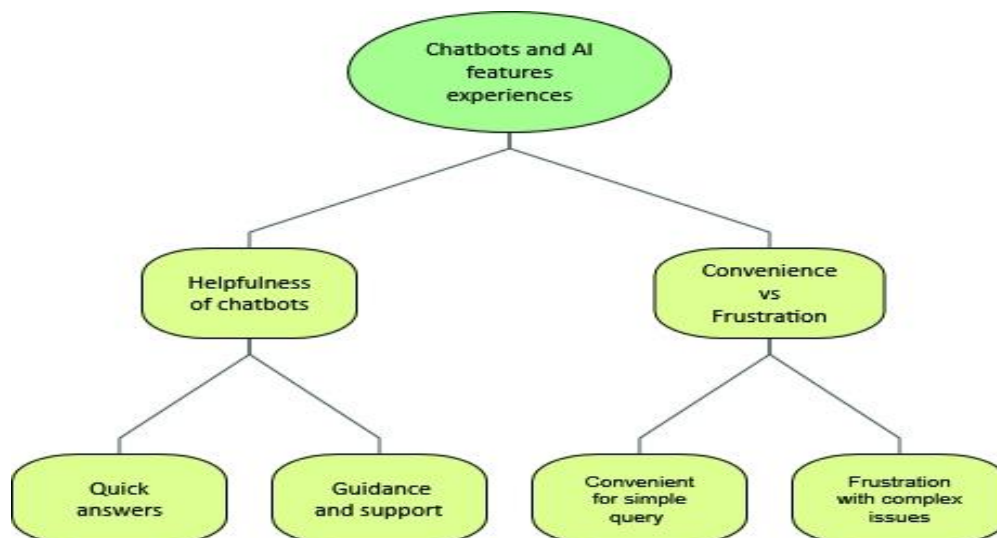


Figure 12 Mind map created in NVivo 12 Plus representing chatbots and AI features experience - qualitative data analysis tool

Chatbots and AI features experience node reflect on participants' perspectives regarding the influence of these tools on their shopping experiences. Participants generally valued chatbots for their ability to provide quick responses and assistance, especially for straightforward inquiries. Chatbots were frequently described as convenient, saving users time when searching for product information or troubleshooting issues. For instance, one participant found chatbots beneficial for comparing product specifications, while another appreciated their support with order-related problems.

Participants noted that although the chatbots were helpful, they sometimes caused frustration, particularly when their responses were repetitive or failed address users' inquiries adequately. Several participants said that chatbots struggled to comprehend complex questions, which rendered the interaction somewhat impersonal. One participant noted that they sometimes felt "stuck" by chatbot responses, resulting in a less favorable experience when they needed more detailed assistance.

The researcher noticed that, in spite some challenges, the majority of the participants believed that AI features such as chatbots improved their shopping experience. The effectiveness of

receiving quick responses, along with tailored product tailored recommendations, usually contributed to a more seamless process. In conclusion, participants recognized the efficiency of chatbots for straightforward questions but also expressed frustration regarding their limited responses to more complex matters. Overall, AI features were perceived as valuable for enhancing convenience, though participants expressed a preference for more refined interactions to alleviate frustration.

4.5. Future expectation for AI

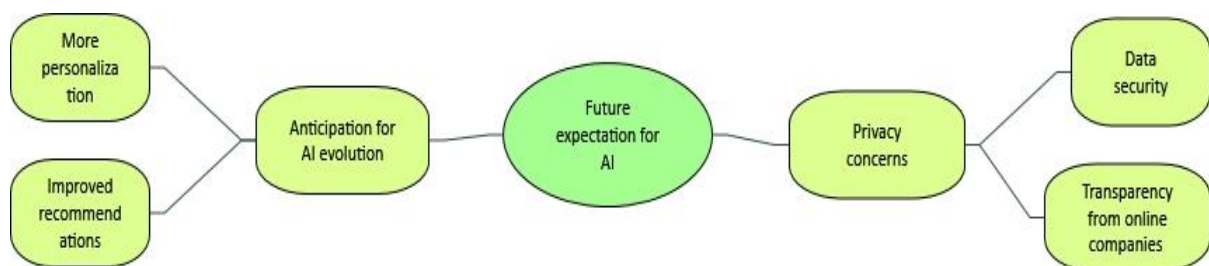


Figure 13 Mind map created in NVivo 12 Plus representing future expectation for AI - qualitative data analysis tool

The future expectation for AI node reflects on participants' aspirations and concerns regarding the evolving role of AI-enhanced shopping. While participants predict AI continuing to boost personalization and efficiency, they also express apprehensions regarding data privacy and the necessity for ethical handling of personal data. The researcher observed participants' excitement for AI becoming increasingly intuitive, with anticipation for an even more tailored shopping experience. Many participants expressed their desire for AI to better understand their preferences, provide more personalized suggestions, and enhancing efficiency. For instance, a participant wanted AI to deliver more precise recommendations based on individual style and previous purchases.

In addition to their aspirations, participants raised concerns about data privacy as AI technology advances. The researcher noticed a pronounced desire for clarity regarding using and storing participants' data. Some participants also articulated concerns about AI gathering excessive information, which led to their caution about further integrating of AI into online shopping.

Participants mentioned ensuring data security and offering users control over their information would be vital steps for the liable development of AI.

Overall, participants remain optimistic about AI fostering a more personalized and efficient shopping experience while remaining cautious about privacy risks. They desire transparency and robust security measures to protect their data as technology continues to evolve.

5 Discussion

In this chapter, the researcher will present an in-depth analysis of the research findings, emphasizing essential domains vital to this study. This covers an appraisal of the limitations, reliability, and validity of the study, alongside answers to the research questions that steered the study. Furthermore, this chapter engages in a dialogue between the key findings and the existing knowledge base, highlighting where this research aligns with or contrasts with earlier studies. Finally, the researcher will address compliance with the research ethics guidelines.

5.1. Limitation, reliability, and validity (explain reliability and validity)

Similar to other academic research, this study encompasses several limitations. To begin with, the sample size of this research was somewhat limited, concentrating specifically on millennial consumers in Finland. Although this process facilitated an in-depth examination within a targeted demographic, it limits the potential to apply these results to a larger population or different cultural environments. Furthermore, the research scope was deliberately focused on analyzing the impact of AI exclusively on online shopping behavior in a single country. Thus, some findings may be limited to the Finnish context and may not be fully applicable to millennial consumers in other regions.

According to Okumu (2020), Reliability in a research is the degree of consistency and stability exhibited by measurement instrument, thus ensuring the accuracy of results. For this research several measures were implemented to guarantee consistency throughout the gathering and analysis phases. All the interviews were conducted using a uniform set of questions, enabling participants to express their experiences openly while engaging with the principal theme of the

study. In the data analysis phase, NVivo 12 Plus software was employed for coding, which offered a systematic and organized methodology. The uniformity in coding reduced potential disparities and assisted in organizing and interpreting the findings reliably. Moreover, the researcher adopted a reflective approach, remaining aware of personal biases that could influence the interpretation, thus enhancing the reliability of the research.

Kihlgren (2016) noted that, validity in a research refers to the correctness or precision of research assertions, commonly interpreted as truth, accurate depiction and sufficiency while also being contingent on context and shaped by the agreement within the research community about concepts and implementation. To improve the validity of this research various strategies were employed to guarantee that this study truly depicted the experiences and viewpoints of participants. For example, participants were allowed to review the preliminary interpretation of their responses, which supported the validation of the findings' accuracy and ensured that their perspectives were accurately depicted. This procedure of participant validation played an essential role in establishing the credibility of the research and affirming that the findings accurately represented their experiences. Additionally, efforts were made by the researcher to establish a conducive and confidential environment for interviews, thus encouraging authentic and reflective responses from participants.

5.2. Answering the research questions

The primary aim of this research was to investigate the influence of AI on millennial consumer behavior, specifically in Finland. The study also endeavored to examine how AI technologies would shape millennial consumers' preferences, decision-making processes, and contribute to their overall shopping experience. The results were analyzed and obtained using NVivo 12 Plus.

RQ1: How does Artificial intelligence influence the online shopping behavior of millennials in Finland?

Results indicate that AI-driven technologies significantly influence the shopping behavior of millennial consumers in Finland by enhancing convenience and identifying new products. Several participants acknowledged that personalized AI recommendations remarkably

facilitated their search for products that correspond with their individual preferences, thus decreasing the time and effort invested in online shopping. The convenience offered by AI frequently resulted in impulsive purchasing, where participants purchased items, they had not originally planned to buy. Furthermore, participants recounted scenarios in which they were offered recommendations for complementary products, such as items they had previously searched for, which elevated their overall online shopping experience.

These findings align with existing research that indicates AI technology can enhance consumer engagement and satisfaction by providing relevant recommendations and reducing search challenges. Nevertheless, some participants articulated concerns regarding over-personalization, which they perceive as intrusive at times. As a result, even though AI positively influences the ease and convenience of shopping, there remains a delicate expectation for balancing personalization with comfort.

RQ2: To what extent do AI-driven personalized recommendation impact millennial consumers' product choices and purchasing decisions?

Findings reveal that AI-driven personalized recommendations exert an essential influence on product selection and purchasing decisions of millennials in Finland. Several participants shared experiences where AI-driven personalized recommendations acquainted them with products they may not have encountered otherwise, thus frequently impacting their purchasing choices.

Nevertheless, a few participants conveyed mixed emotions, pointing out that, although the recommendations were advantageous, they sometimes felt prompted to exceed their budgets or acquire irrelevant items. Thus, this raises an ethical issue regarding the extent to which AI influence consumer behavior. This highlights a potential avenue for further research into the ethical practices of AI in e-commerce.

RQ3: How do millennial consumers in Finland perceive and interact with AI-powered features such as chatbots during their online shopping experience?

RQ3 results reveal that, millennials in Finland generally consider chatbots as beneficial for quick support. However, they sometimes find chatbots inadequate in addressing complex

problem-solving scenarios. Many participants pointed out how chatbots improved their shopping experience by supplying immediate responses to their queries such as production description or tracking order thus, enhancing convenience. However, participants noted that when faced with complex issues, they communicate their dissatisfaction with chatbots' limited capabilities and indicate a preference for human support. This suggests that companies functioning online need to consider hybrid models that integrate AI-supported assistance with human representatives to promote a more comprehensive customer service experience.

5.3. Theoretical contribution

This section encompasses a comparison of key results with the insights and discussions presented in Chapter 2.

The introduction of AI into online retail has become a significant determinant influencing millennial shoppers in Finland, as evidenced by both the results and research within this research. Participants consistently highlighted the advantages of personalized advertising, chatbots, and recommendation systems, which aligns with the observation of Baby et al. (2024), who noted that AI-driven technologies enhance customer satisfaction by providing personalized solutions. Findings from this study reveal that millennials appreciate the convenience and efficiency of these tools, thus highlighting the important role of AI in facilitating an effortless shopping journey.

However, privacy and trust concerns remain a pressing issue for participants. These results align with the observations of Lalar et al. (2021), who acknowledge that the lack of transparency regarding AI data management often diminishes consumers' trust. Additionally, Arora (2023), elaborates on the dangers linked to data privacy violations, highlighting the necessity for companies to implement robust security protocols to preserve customer trust. Participants in this study expressed similar concerns, specifically about the potential exploitation of their data by AI-driven platforms.

Furthermore, another key result is the emotional intelligence demonstrated by chatbots. Participants revealed their frustration when the chatbot was unable to comprehend their demands or effectively address problems. This aligns with research by Matini (2023), claiming that the lack of emotional intelligence in chatbots often diminishes user satisfaction and

engagement. The study findings suggest that enhancing the empathy skills of chatbots could significantly improve their effectiveness in the online shopping environment.

Moreover, challenges such as inaccurate recommendations and over-personalization were highlighted in the key results, reflecting the concerns articulated by Menard and Bott (2024). These challenges, often originating from algorithmic biases or restricted datasets, frequently result in consumer dissatisfaction. As highlighted in the literature, reliability and accuracy of AI tools are essential to their overall effectiveness (Yan-min et al., 2024).

Finally, the results align with the initiatives discussed in the literature review designed to address these challenges. Programs such as Finland's AI 4.0 initiative, as outlined by the European Commission (2021), highlight the significance of collaboration among industries and regulatory frameworks to promote the ethical adoption of AI. Participants also emphasized the necessity for transparency, strong security measures, and ethical guidelines, thus aligning with the literature review for a balance between innovation and consumer protection.

5.4. Compliance with research ethics guidelines

This study carefully followed ethical standards to preserve the integrity and credibility of the research. Before commencing the data collection phase, the researcher endeavored to secure informed consent from each participant, which guaranteed that they understood the purpose of the analysis, their rights, and the voluntary aspect of their involvement. Confidentiality and anonymity were assured through the secure storage and anonymization of data to prevent participant identification. This research also adheres to the GDPR regulation concerning personal data management, ensuring that the data is used exclusively for the intended academic aims. Participants were granted the choice to discontinue from the research at any moment, respecting their independence during the entire process. These ethical guidelines not only maintain academic integrity but also enhanced trust and transparency between the researcher and the participants.

6 Conclusions

The main objective of this research was to examine the impact of artificial intelligence on the online shopping behavior of millennials in Finland. The findings indicate that, AI-powered features like personalized recommendations, chatbots, and virtual assistant significantly influence consumer purchasing choices, behaviors and perceptions by enhancing convenience and personalization, while also generating concerns regarding privacy and trust.

6.1. Key Findings

The results obtained from this research indicated that AI-driven personalized recommendations significantly enhance shopping experience by tailoring suggestions to align with individual choices, alleviating decision-making challenges, and increasing the possibility of unplanned purchase. Participants mentioned that these features simplify their shopping experience by offering relevant choices and reduce the necessity for exhaustive searches.

Furthermore, chatbots became another significant AI feature influencing millennial consumers. Although participants acknowledged the convenience and promptness of chatbots in responding to inquiries and managing orders, they highlighted the frustrations resulting from their limited emotional awareness. Several participants expressed disappointment when chatbots did not deliver empathetic responses or adequately address complex issues, thus emphasizing the need for advancement in this sector.

Additionally, issues regarding privacy and trust were noticeable throughout the findings. Participants demonstrated a cautious attitude towards the collection and utilization of personal information, highlighting wider concerns about transparency and data protection within AI systems. Regardless of these concerns, many participants acknowledged the innovative potential of AI in online shopping and conveyed optimism about its potential advancements, such as better personalization and increased productivity. Overall, this research presents a double narrative: AI technologies significantly improve convenience and personalization in online shopping, yet they also provide challenges concerning trust, privacy and emotional engagement. These findings present significant perspectives on the expectations and concerns

of millennials in Finland, acting as a reference for businesses functioning online to refine AI-driven systems and better address user issues.

6.2. Managerial implications

The outcomes of this research provide practical insights for e-commerce platforms and online retailers striving to improve the infusion of AI technologies into online shopping. The enhancement of personalized recommendation systems is essential for a more precise alignment with customer preferences. Nevertheless, businesses should refrain from over-personalization, which may overwhelm or distance users. Transparent communication concerning the process of generating recommendations can build customer trust and loyalty.

Furthermore, it is essential to consider privacy and trust issues. E-commerce platforms are required to establish robust data protection measures and transparently communicate their practices to consumers. Adhering to regulations such as GDPR and managing user data transparently are essential for upholding legal and ethical standards.

Additionally, enhancing the capabilities of chatbots creates valuable potential. Through the adoption of natural language processing technologies, businesses can enhance chatbots to be more empathetic and adept at resolving more complex issues. This action would boost customer satisfaction and foster a more enjoyable experience.

In conclusion, e-commerce platforms should perceive AI as a developing tool that demands constant advancement to remain competitive. The consistent gathering of consumer feedback and staying aware of advancements in technology, will assist online businesses in refining AI systems and ensure that they align with the changing demands of consumer.

6.3. Recommendations for future research

This thesis targeted millennials in Finland; however, future studies may analyze the effect of AI on consumer behavior across diverse cultural and regional contexts. Widening the geographical framework would provide a more comprehensive understanding of the impact of artificial intelligence in diverse demographics. Furthermore, examining other generational groups, such

as Generation Z and Baby Boomers, might uncover generational distinctions in how consumers interact with AI technologies within online shopping.

Further studies could also delve into the lasting influence of AI-generated personalized recommendations on users' choice and brand loyalty. Evaluating strategies to address privacy and trust concerns, including the implementation of technologies that enhance privacy and transparent data management practices, could provide actionable solutions to companies.

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Appendix

Appendix 1. Interview questions

Q1. Can you describe a recent experience where you encountered AI technologies like personalized recommendations, chatbots, or virtual assistance while shopping online? What was the experience like?

Q2. When you shop online, in what ways do AI technologies like personalized recommendation, chatbot, or virtual assistants typically interact with you? How do you usually respond to these features?

Q3. How do AI technologies like personalized recommendation, chatbots, or virtual assistants influence your shopping behavior or decision-making?

Q4. Have you ever made a purchase based on AI-driven recommendations or suggestions? Can you provide an example?

Q5. How much do you trust AI technologies regarding privacy and data security when shopping online?

Q6. Have any other privacy concerns affected your use of AI tools in online shopping? If yes, what concerns specifically, and how have they impacted your behavior?

Q7. How have you mitigated or managed privacy risk related to AI-enhanced online shopping?

Q8. How do AI driven features like AI affect your online shopping experience (for example, convenience, ease of use or frustration)?

Q9. Do you find these features helpful or do they sometimes hinder your shopping experiences? Please explain.

Q10. What are your thoughts on the future of AI in online shopping?

Q11. What expectation or concern do you have regarding the further integration of AI into your shopping experience?

Appendix 2. Screenshots from NVivo 12 Plus

Appendix 2.1. Screenshot presenting the interview transcripts uploaded in NVivo 12 Plus software program.

The screenshot displays the NVivo 12 Plus software interface. The top menu bar includes File, Home, Import, Create, Explore, Share, and Document. The Document Tools ribbon contains various options like Annotations, Quick Coding, Layout, Coding Stripes, Highlight, Code, Code In Vivo, Range Code, Uncode, Auto Code, New Annotation, Annotations, Word Cloud, Explore Diagram, Visualize Document, Chart, Compare With, Query This Document, Find, and Edit.

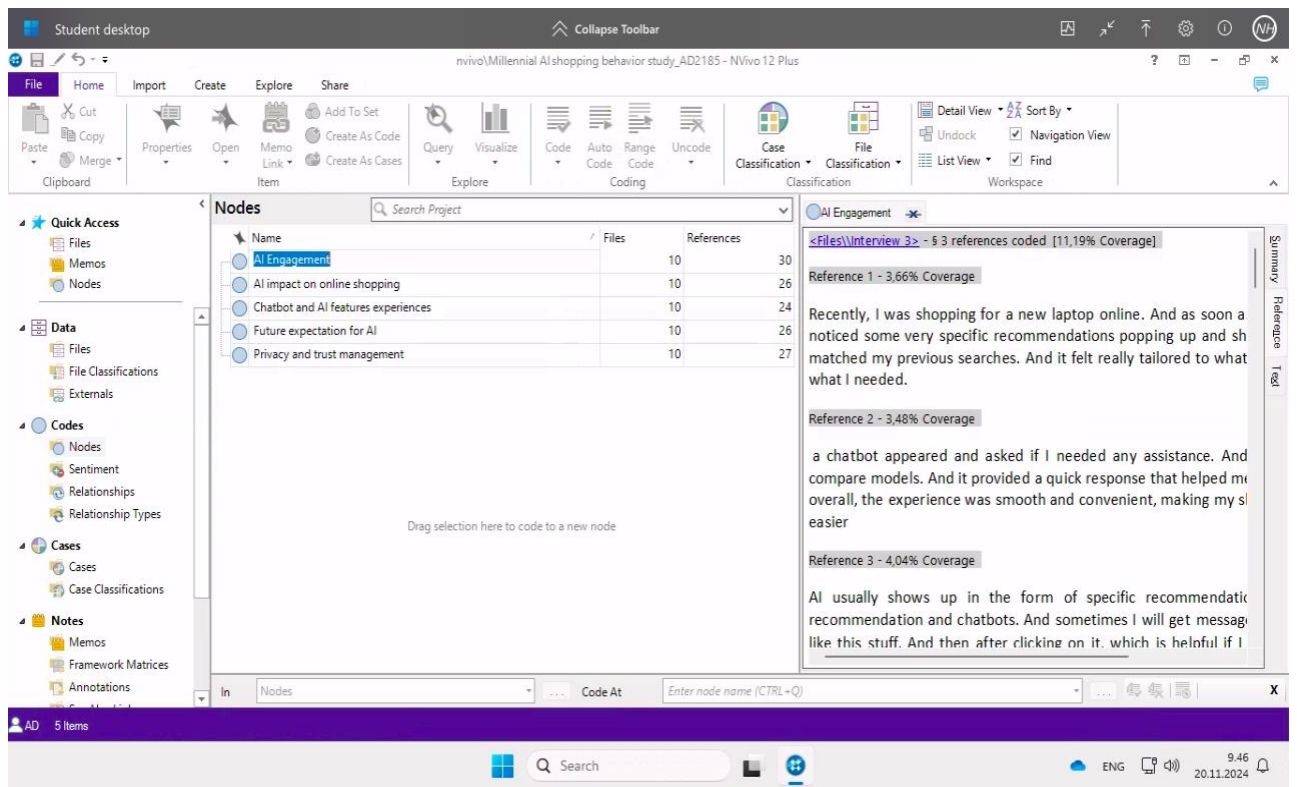
The main workspace is divided into three panes:

- Left Pane (Quick Access):** Shows a tree view with categories: Quick Access (Files, Memos, Nodes), Data (Files, File Classifications, Externals), Codes (Nodes, Sentiment, Relationships, Relationship Types), Cases (Cases, Case Classifications), and Notes (Memos, Framework Matrices, Annotations).
- Center Pane (Files):** A table listing interview transcripts with columns for Name, Codes, and References.

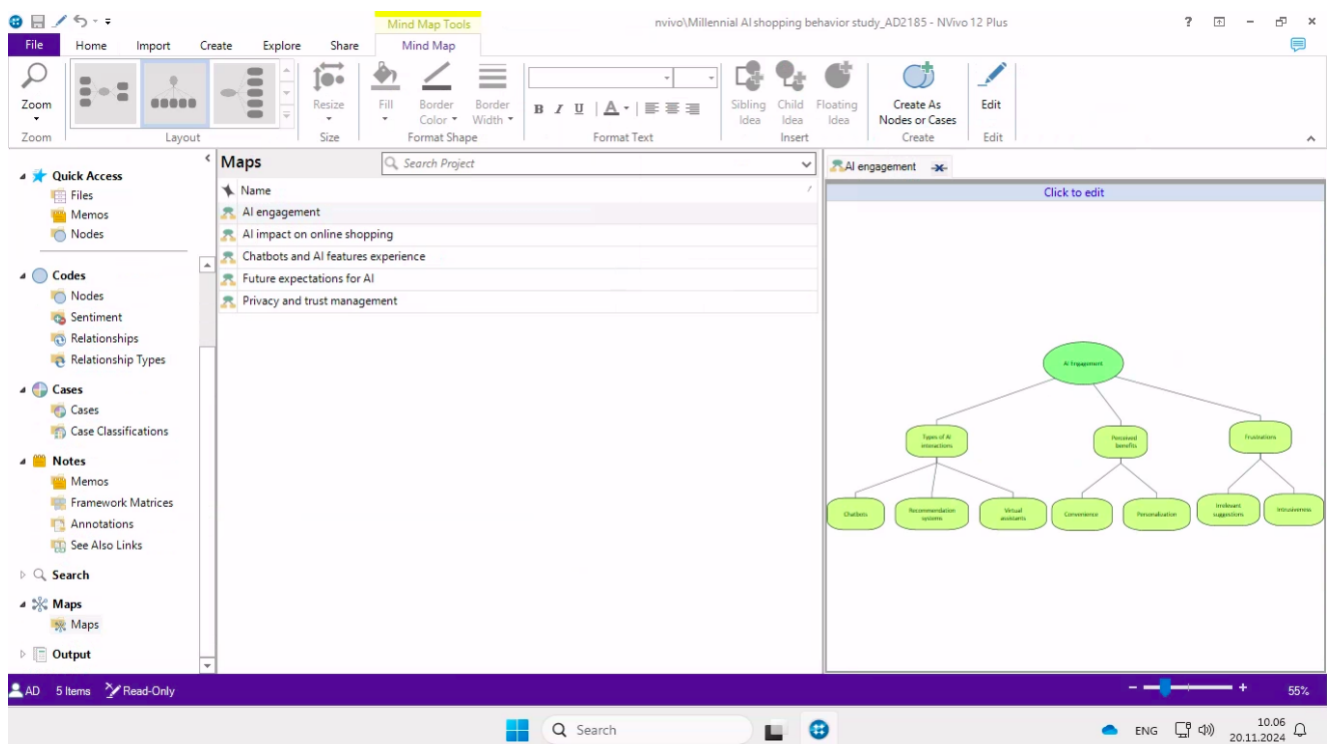
Name	Codes	References
Interview 3	5	13
Interview 4	5	14
Interview eight	5	11
Interview five	5	12
Interview nine	5	12
Interview one	5	13
Interview seven	5	15
Interview six	5	15
Interview ten	5	13
Interview two	5	15
- Right Pane (Interview 3):** A preview of text from Interview 3, showing two paragraphs of text. A "Click to edit" link is visible at the top of the text area.

The bottom status bar shows "10 Items", "Codes: 5", "References: 13", "Read-Only", and "Line: 1 Column: 0". The Windows taskbar at the bottom indicates the system time as 9:45 on 20.11.2024.

Appendix 2.2. Screenshot showing the nodes generated during the data analysis process of the interviews in NVivo 12 Plus software program.



Appendix 2.3. Screenshot showing the mind maps generated from the results obtained using NVivo 12 Plus.



Appendix 3. Nodes and supporting quotes from participants

Nodes	Supporting quotes from participants
AI engagement	“Recently, I was shopping for a new laptop online and as soon as I started browsing, I noticed some very specific recommendations popping up and showcasing models that matched with my previous searches and it felt really tailored to what I was looking for and what I needed”
AI impact on online shopping	“AI technologies influence my shopping by making me more likely to buy items I did not plan to buy before, which is thanks to personalized recommendation, they sometimes help to highlight relevant products for me”
Privacy and trust issues	“Sometime I worry about my data being shared or sold, especially since AI can track everything from my click to my shares, this has made me more cautious, I am less willing to sign up for accounts or allow full permission”
Chatbots and AI features experience	“Chatbot makes my shopping easier by quickly responding to my queries which is convenience., but sometimes they can be frustrating when they do not understand what I need or give unhelpful responses”
Future expectation for AI	“I expect AI to make online shopping even more personalized and convenient, but also I concerned about privacy and data security”