

Artificial Intelligence in E-commerce

**Progressive AI application as a solution to improve customer
experience in the E-commerce industry**

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Abstract

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Title of the thesis Artificial Intelligence in E-commerce: Progressive AI application as a solution to improve customer experience in E-commerce		
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Abstract <p>The digital world is expanding at an unprecedented rate, and this has an immense influence on the potential growth of e-commerce. The ongoing pandemic has further propelled the expansion of e-commerce, along with ever-evolving customer demands and shopping habits, making it essential for businesses to employ artificial intelligence to enhance productivity.</p> <p>The thesis aims to widen our understanding of artificial intelligence and explore how it has revolutionized the e-commerce landscape in improving customer experience problems. Ultimately, the study endeavours to establish that AI represents a significant opportunity for the future of our world.</p> <p>The empirical research aspect of the thesis adopts a combination of qualitative and quantitative methods, utilizing a deductive research approach. The primary source of data collection was an online survey that was distributed to participants of varying age groups, via different digital platforms. Additionally, the study utilized secondary sources such as literature reviews, printed sources, books, and online sources, to supplement the data collected from the primary sources. The use of both primary and secondary sources allowed for a comprehensive and well-rounded analysis of the topic under investigation.</p> <p>The study's results suggest that integrating AI technologies into e-commerce is a highly effective strategy. By leveraging AI, businesses can greatly enhance customer experience, attract new clientele, and improve their prospects. Additionally, the study underscores AI's potential to transform a wide range of industries, showcasing the significant role that AI is poised to play in shaping the future of various sectors</p>		
Keywords Artificial Intelligence, AI, E-commerce, Customer Experience		

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1 Introduction

1.1 Thesis Background

Artificial intelligence is no longer an unfamiliar term. It is becoming more important and being employed in all areas of life in recent years, such as healthcare, biology, information technology, and business. In actuality, our daily lives involve frequent and continuous interactions with artificial intelligence through diverse means. For example, the way we use our phones, like facial recognition (Face ID) to unlock or predict words (predictive text) and automatically correct mistyped words based on users' typing habits, all use artificial intelligence technology. Practical uses for artificial intelligence can be found both within and outside the home. Driverless cars, voice recognition, recommendation systems, and automated robots are all examples of phenomena technologies based on AI. (Schwab 2016.)

Artificial intelligence is a system of algorithms developed to help computers think and reason to solve issues as humans do. It also provides communication through language comprehension, learning, and self-adaptation. In business, AI techniques are applied in various ways, but most concentrate on promoting growth. It brings many advantages to businesses, such as increasing productivity, improving customer decision-making, and enhancing customer experience. Moreover, AI may be integrated into almost any business strategy. (Wharton School 2022.)

After two years of the COVID-19 pandemic, retail and e-commerce businesses have been developing rapidly because of the behavioral shifts in shopping habits. During the pandemic, everyone turned to online shopping more frequently than ever before because they embraced the social distancing urged by state governments. As a result, businesses saw that standard shopping was becoming trickier and more challenging. Also, it was discovered that e-commerce is more productive than conventional stores because companies can cut costs and customers can buy things whenever, wherever, and in a variety of ways. However, e-commerce businesses have to face some significant challenges such as lower loyalty and a lack of customer connection. Therefore, is a good solution for a large business to deal with those challenges by adopting emerging technologies, especially AI techniques that created connections with customers and facilitated a more convenient customer experience? (Fryer 2022.) This thesis explores whether AI has already been implemented in business, specifically e-commerce. The goal of the thesis is to discuss the importance of AI implementations in online business platforms in providing an excellent customer experience.

1.2 Thesis Objectives, Research Questions, and Limitations

Thesis Objectives

The primary objective of this study is to give a clear idea about artificial intelligence in order to clarify how to correctly view them, as opposed to idolizing them, and ways AI can enhance the customer experience in e-commerce. Moreover, for companies of small and medium to large sizes that take the customer's shopping experience as a profit point, the thesis can be used as a document to consider whether it is worth investing in the application of artificial intelligence to bring a breakthrough experience to their customers. Customer experience plays a significant role for businesses, and it is more remarkable in an e-commerce environment where there is a lack of face-to-face interaction. In addition, the author also provides some highlight AI applications in online business platforms in order to demonstrate the technology's enormous potential and today's global AI landscape.

The purpose of the study is formulated as follows:

- Explaining the theoretical background of artificial intelligence and e-commerce and showing AI applications in e-commerce.
- Conducting a survey on everyone's knowledge of AI and it is in e-commerce and analyzing the results.
- Describing and Evaluating highlight real-world applications of AI in e-commerce concerning their usefulness and applicability to businesses and consumers.

Research Questions

The research questions are the key questions that the author's study attempts to answer. They serve as the foundation for a dissertation, thesis, or research endeavor. In this thesis, the research questions are presented by the author at the beginning of their document and will be answered by them at the end. The research questions will be the driving factor throughout the research process. (Saunders et al. 2016, 42-45.)

The main research question and sub-questions for this thesis were constructed by the author to further concretize the study topic.

The main research question:

- How businesses can use AI to improve the customer experience in E-commerce?

And the sub-questions:

- What benefits and disadvantages do applying AI in e-commerce provide businesses and their customers?

- What are the highlights applications of AI in e-commerce in the real world?
- What are customer perceptions of AI uses in their daily life and e-commerce?

Research Limitations

Research limits are defined as the study's flaws or deficiencies, which are frequently caused by variables beyond the researcher's control. Time, money, availability of resources, tools, information, and involvement are all examples of such factors. (Theofanidis & Fountouki 2018.) The following paragraphs detail certain limitations on completing the thesis.

First of all, the study's primary areas of interest are artificial intelligence applications and e-commerce; hence, other industries are left out of the thesis.

Furthermore, the research does not cover the technical functionality and engineering components of given programs, as their primary focus is on demonstrating the efficacy of AI applications in e-commerce. The goal is to analyze various AI technologies and the outcomes they can generate.

1.3 Theoretical Framework

Two primary theoretical frameworks in this thesis are artificial intelligence and e-commerce.

The theoretical component of AI provides the first understanding and history of AI. Also, this chapter provides knowledge about AI classification and the impact of AI on business. The next chapter will then clarify E-commerce, its benefits, and challenges. In addition, this chapter provides the importance of customer experience in e-commerce. Finally, at the end of this chapter, how AI is used in e-commerce through some practical examples is discussed

1.4 Research Methodology and Data Collection Methods

1.4.1 Research Approach

Approaches to research can be defined as the collection of procedures and plans that determine the overall research process. As a result, the research approach can be classified into three types: inductive, deductive, and abductive. The inductive approach begins by collecting data and observing those data. The collected data are examined for patterns, which are then used to develop a theory that could explain the patterns. Whereas, the deductive approach starts with a theory and then tests its implications with data. The results provide either support for or opposition to the theory. In other words, the inductive approach proceeds from particular observations to sweeping generalizations. Inversely, the deductive approach functions. The goal of abductive research, in contrast, is to provide an

explanation, so it involves going back and forth between theory and data (Saunders et al. 2016).

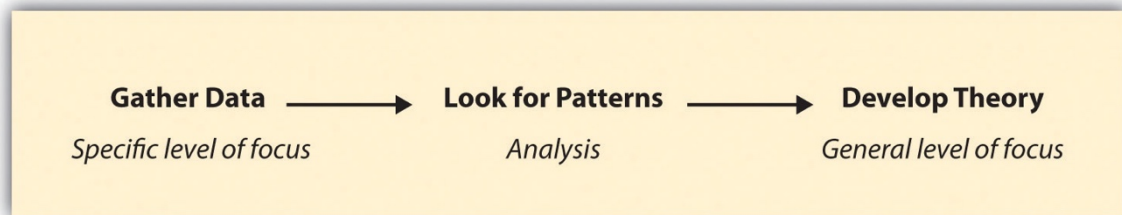


Figure 1. Inductive research (Blackstone 2012).

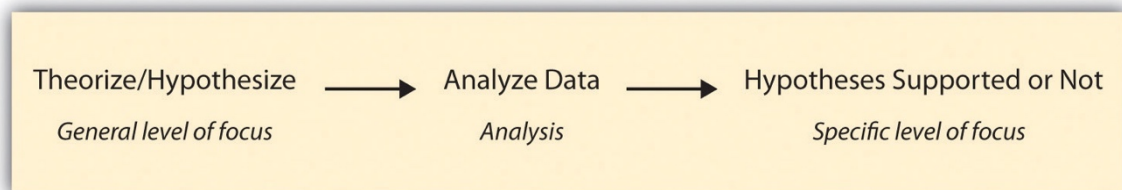


Figure 2. Abductive research (Blackstone 2012).

1.4.2 Research Methodologies and Data Collection

This thesis relies primarily on both qualitative and quantitative methods – mix method.

Literature review and web-based qualitative research are among the research methods used. Quantitative methods rely on a survey to determine how well people understand AI and its implementation in general, as well as its potential applied in e-commerce in particular. The survey results will be subjected to qualitative analysis.

1.5 Thesis Structure

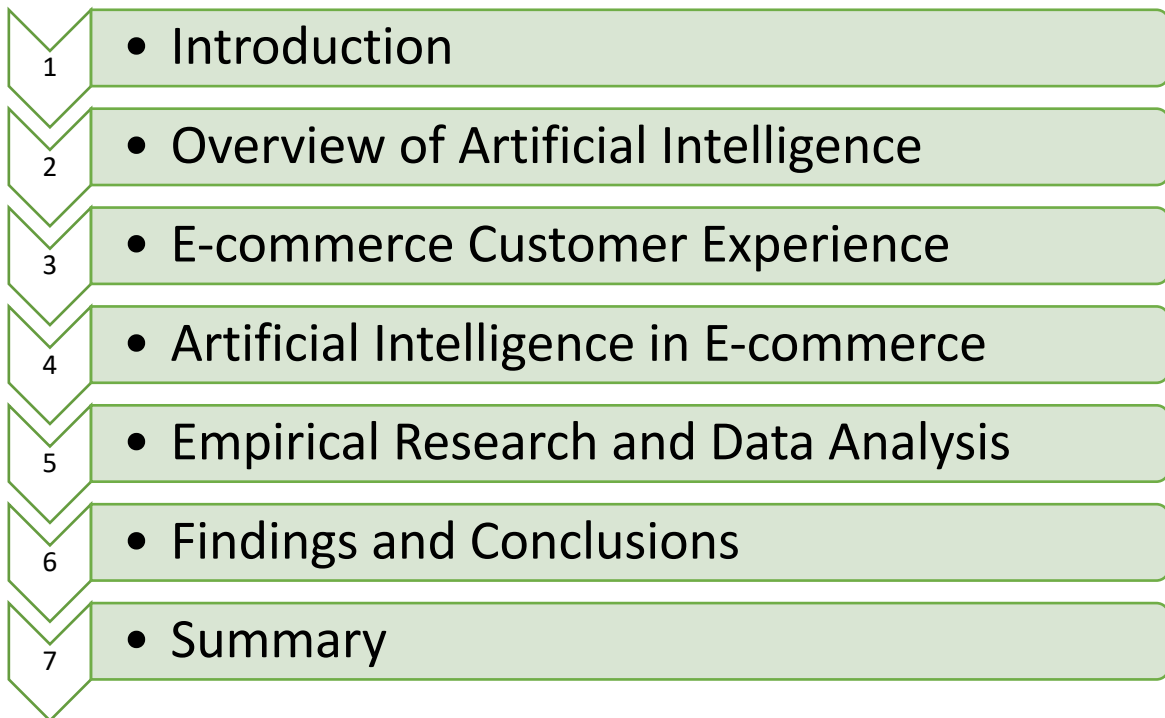


Figure 3. Thesis structure

Based on figure 3, this thesis contains seven chapters:

Chapter 1 is the introductory chapter, it comprises several essential components, such as the background of the research, the purpose of the study, the research question, the limitations of the research, the theoretical framework, the research methodology, the data collection process, and the overall structure of the thesis.

Chapters 2 and 3 constitute the theoretical foundation of this thesis, wherein the reader is furnished with a fundamental comprehension of the concepts of Artificial Intelligence (AI), e-commerce, and customer experience. Chapter 2 pertains to AI in a general context. The author endeavors to provide a lucid definition of AI, its classifications, and its global impact. In contrast, Chapter 3 is primarily focused on e-commerce and its role in shaping the overall customer experience in the business domain. Additionally, the reader is presented with an overview of the reasons behind businesses' increasing emphasis on promoting their e-commerce activities, particularly in the aftermath of the Covid-19 pandemic.

Chapter 4 answers two research questions about the highlighted applications of AI and the benefits and disadvantages of applying AI in e-commerce to provide businesses and their customers.

In Chapter 5, the research findings are presented, encompassing both quantitative and qualitative results derived from a survey conducted on the topic of Artificial Intelligence (AI) in general about everyone's perception, and the satisfaction, and attitude toward AI in daily life and in e-commerce.

Chapter 6. This chapter provides responses to both the sub-question and main question of the thesis, along with suggestions for further research and an evaluation of the reliability and validity of the study.

Chapter 7. The final chapter of this thesis is a summary chapter.

2 Overview of Artificial Intelligence

There are many different definitions of artificial intelligence due to its versatility and complexity. The second chapter introduces the key terminology, classification, and history of AI

2.1 AI Definition

Artificial intelligence has numerous definitions because of its massive study and application. The definitions have evolved and aided one another over time (dictionaries' definitions and other authors' definitions), but a broader perspective would provide a more complete picture of AI.

Initially, trustworthy definitions of "artificial intelligence" were provided by dictionaries. According to the Oxford dictionary – a reliable dictionary, AI was characterized as the creation of computer networks that can do activities that usually require human intellect, such as vision, voice recognition, decision-making, and language comprehension.

Moreover, to simplify this complex concept, other mé have provided the following definitions.

The basis of "What is Artificial Intelligence", the author - John McCarthy (2007) coined the word "artificial intelligence" known as autonomously thinking machines. He explained AI as the study and development of smart machines, especially smart computer programs.

Vijay Kanade – an AI researcher, defined "AI as the intelligence of a computer or machine that enables it to imitate or mimic human capabilities". Artificial intelligence employs a variety of technologies to give machines human-like intelligence by enabling them to sense, comprehend, plan, act, and learn. In their most basic forms, AI systems can notice environments, recognize things, join in decision-making, solve intricate problems, recall past experiences, and imitate patterns. (Kanade 2022.)

In conclusion, Artificial Intelligence is a computer science subfield devoted to the development of machines that behave and function similarly to humans. Included in these processes are learning, planning, and problem-solving. The primary objective of artificial intelligence is to create expert systems - frameworks that demonstrate behaviors, and learning, illustrate, clarify, and advise clients. The second objective is to apply human intelligence to machines by creating frameworks that can understand, think, learn, and behave.

2.2 History and Development of AI

2.2.1 History of AI

The historical background of artificial intelligence has existed for approximately 100 years. In the year 1920, the Czech playwright, Karel Čapek coined the term artificial man throughout a sci-fi play that was called Rossum's Universal Robots (Rossumovi Univerzální Roboti), known as R.U.R. The play revolves around a factory that produces artificial men, called robots. In RUR, robots were originally born to work for humans, but then revolted and led to the extinction of humanity. The play was a groundbreaking science fiction work that audiences found to be both captivating and terrifying. First, it presents the term robot, even though it does not possess the advanced thought of robots. Additionally, it is relating the story of how robots were created. However, RUR's dystopian future scenario in which robots pose a threat to humanity was audacious and horrifying. (Lowe 2021.)

At the beginning of 1950, "Computing Machinery and Intelligence," marked the beginning of the AI discussion. Alan Turing was a young British polymath and computer scientist who investigated the mathematics underlying artificial intelligence. He often referred to as the "father of computer science," asks one question about that machines could think in his seminar work. Thence, he propounds the now-famous testing method that is Turing Test, in which an interrogator tries to distinguish between a text response from a computer and one from a human. Because this is one of the first tests of artificial intelligence, it is an important element of the history of AI and a continuing philosophical concept that incorporates linguistics-based ideas. (New 2020.)

In 1956, John McCarthy, who came along a few years after Turing, is credited with being the first person to use the word "artificial intelligence" to explain machines that are capable of thinking on their own Dartmouth Conference. Allen Newell and Herbert Simon were instrumental in advancing AI as a potentially world-changing field of software engineering. (Ray 2018.)

The 1960s was a time of active activity for researchers in the AI field. Research on AI during this time achieved remarkable achievements such as developing robots with machine learning capabilities, However, these successes created too high expectations for AI. Therefore, by the mid-1970s, progress in the field of artificial intelligence slowed for a variety of reasons. Computer scientists faced a severe lack of funding for artificial intelligence research. These years eventually became known as the "Artificial Intelligence Winters" or "AI Winters." (Ray 2018.)

Until the 1980s, the development of AI was aided by both financial resources and tools for algorithm creation. This was a crucial factor in the subsequent developments, such as IBM's DeepBlue-chess computer, which in 1997 beat World Champion Gary Kasparov. (Potenza 2021; Ray 2018.)

2.2.2 The current state of AI

These days, we can collect massive volumes of data that would be extremely difficult for a human to analyze without the advent of "big data." Numerous fields, including technology, banking, marketing, and entertainment, have already reaped the benefits of the implementation of artificial intelligence with great success. (Anyoha 2017.)

The most recent research from the AI Index found that enterprise usage of AI grew by 47% in comparison to 2018. That interest in AI-related technologies and businesses has led to over \$70 billion in private investment worldwide in 2019, according to the same research. (Marsner 2020.)

In particular, from 2020 to 2021, with the assistance of AI, medical laboratories and health corporations were able to create vaccines for the pandemic that affected the entire world in a matter of months, whereas the development of vaccines typically took years. In addition, researchers and scientists at MIT use AI to try to find ways to use existing medications to fight the pandemic. Even before the pandemic reached its peak, many healthcare professionals assumed that artificial intelligence would be the ultimate solution to many of their issues. After more than two years of use in the fight against the COVID-19 virus, artificial intelligence has already demonstrated its effectiveness. (Pechardscheck 2021.)

Moreover, there are some examples of everyday uses of AI:

Siri, the voice assistant of Apple, uses artificial intelligence to better understand user commands and routines to become more helpful over time. While it is still not as responsive as a human assistant, it is getting more and better at its job.

With another example, Netflix utilizes AI to provide recommendations and trends. Netflix's AI analyzes user viewing history and ratings, as well as dynamic factors such as the time of day, to determine users' viewing preferences. (Simplilearn 2022.)

To summarize, AI is transforming the way businesses operate and work with their processes and products on both sides. It is also impacting the way businesses interact with their customers. Companies of all sizes use AI to enhance processes, analyze big data more quickly, and reduce human error and labor. Customers derive tangible benefits from the

outcomes. AI has too much potential to be ignored, despite the costs and other obstacles involved in its successful implementation.

2.3 Types of Artificial Intelligence

Artificial intelligence is categorized by several standards. The two primary classifications of AI are capability and functionality.

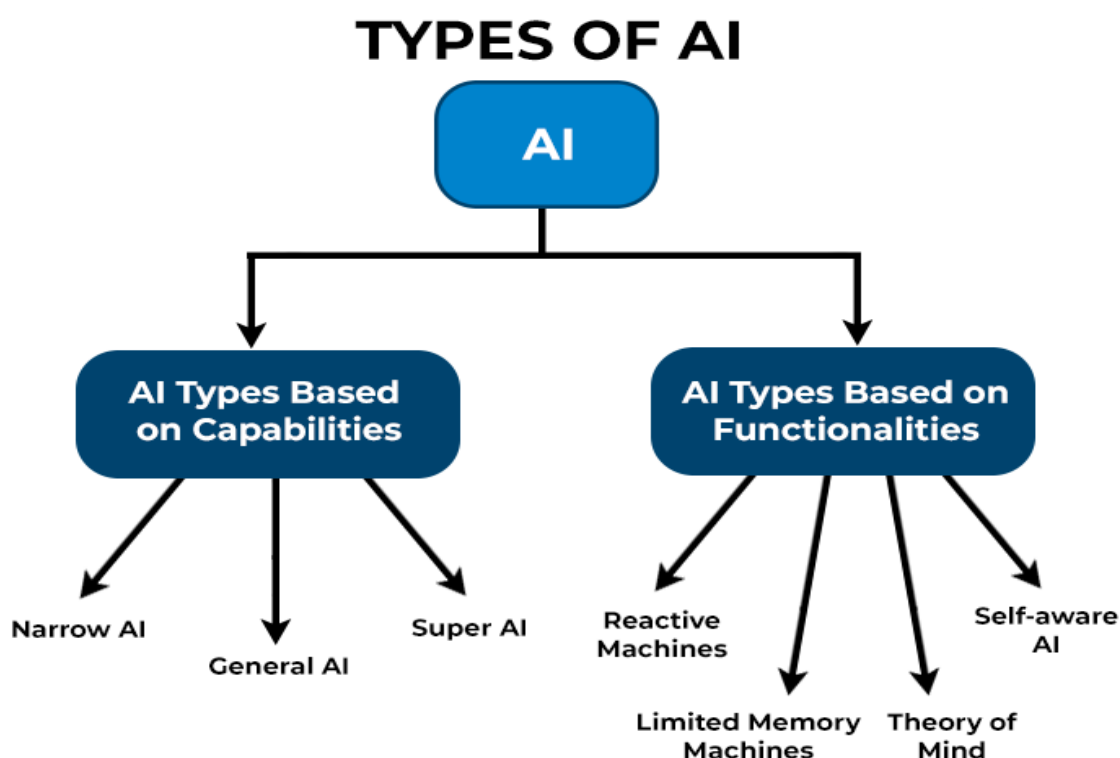


Figure 4: Types of AI (Kanade 2022.)

2.3.1 Capability-Based Classification

AI has three types of criteria of capability:

Artificial Narrow Intelligence (ANI)

First, narrow AI is a type of AI in which a learning algorithm performs a specific task, and the knowledge obtained from that work is not automatically applied to subsequent tasks. Today's ubiquitous machine intelligence is a form of narrow artificial intelligence. Siri and Watson from Apple and IBM, respectively, are examples of narrow AI. Narrow AI, also known as weak AI, works within a restricted and predefined set of contexts, limitations, and

parameters. For instance, Netflix recommendations, e-commerce purchase suggestions, self-driving cars, speech and image recognition, and language translation. (Kanade 2022.)

Artificial General Intelligence (AGI)

General AI allows machines to understand, learn, and carry out logical tasks similar to humans. The goal of general AI is to create a system capable of independent thought comparable to that of humans (Kanade 2022). However, we currently lack this type of AI. It is the primary focus of some scientific research on artificial intelligence and a popular subject matter in science fiction and future research. (Topper 2023.)

Artificial Super Intelligence (ASI)

The last type of AI based on capability is super artificial intelligence. As the term suggests, super AI is one of the artificial intelligence types that can exceed human brainpower by showing mental skills and developing thinking skills. Artificial superintelligence is the most advanced, and powerful that surpasses the intelligence of Albert Einstein and other brilliant minds. (Kanade 2022.)

Superintelligent can be self-aware and generate fancy interpretations that humans are incapable of. It is because the capacity for cognition in the human brain is restricted to a few billion neurons. It is also capable of comprehending and analyzing human emotions and experiences, in addition to replicating human intelligence's many facets. Super AI develops its own emotional understanding and so on based on the AI's comprehension capacity. However, currently, superintelligence is more of a theoretical possibility than a practical reality, as the majority of current computer science and AI research focuses on narrow artificial intelligence. (Kanade 2022.)

2.3.2 Function-based Classifications

There are four main categories according to the current classification system:

Reactive machines

The most fundamental sort of artificial intelligence is reactive AI, which is designed to generate predictable outcomes in response to input. Reactive robots constantly reply to identical events and can be unable to learn or imagine the past or future. (Kanade 2022.)

These are instances of reactive AI:

- Email spam filters keep advertisements out of our inboxes
- The Netflix recommender system

Reactive AI represented a monumental step in the evolution of artificial intelligence, but these AIs can only perform the tasks for which they were programmed. Therefore, they are inherently limited and amenable to improvement. From this foundation, scientists developed the next generation of artificial intelligence. (Mar 2021.)

Limited memory machines

Secondly, limited memory machines AI has the ability to temporarily store and use historical data or experiences. This type of AI blends programmed past knowledge, and observable data to create predictions and carry out tough classification tasks. It's the most popular form of AI right now. The best examples of these models can be found in a self-driving car that can keep track of nearby vehicles' speeds, distances, speed limits, and other pertinent data to help it navigate the traffic. (Kanade 2022.)

Theory of mind

It is the following type of artificial intelligence based on functionality. This type of artificial intelligence interacts with human thoughts and emotions. This artificial intelligence primarily targets persons whose minds can be influenced by multiple factors, such as comprehension humans. "Comprehension" is the central concept of the Theory of Mind. It may include topics such as behavior, emotions, human nature, and feelings, among others. This is regarded as one of the most important technological developments for classifying people's emotions, feelings, and thoughts. (Chandrasekar 2022.) However, it is just speculation at this point.

Self-aware AI

Last but not least, self-aware AI is the most advanced form of AI. It is typically the representation shown in action movies that many people fear. When computers can understand their own feelings and those of other people, they will have reached a level of intelligence and consciousness on par with humans. There will be wants, needs, and feelings in this form of AI as well (Mar 2021). Although self-aware AI is not yet a practical possibility, research and development are continuing in this direction. (Kanade 2022.)

2.4 The Impact of Artificial Intelligence on Business

The definition of a business is "a group or ambitious component engaged in professional, mechanical, or commercial activity." It's the coordinated efforts of a group of people to create and sell a product in order to get more money. Due to the increasing volume of data accessible and the shifting interests and complexity of clients, modern businesses no longer rely on time-honored methods of conducting business to fuel expansion. These dramatic

shifts, enabled by AI, have opened up a new universe of potential outcomes that can be exploited to propel corporate growth via indelible experiences based on customer data. (Virginia 2021.)

Simply put, in business, artificial intelligence is simply the use of a fake human intelligent computer to support revenue, improve customer satisfaction, raise profitability, and boost business growth and change.

Firstly, AI has a positive impact on business because of business process automation. Business processes that can be automated can be found in management, operations, supply chain, human resources, and marketing, among others (Lawton & Tucci, 2022). For example, in Human Resources departments, Machine Learning supports the analysis of large amounts of data, prediction of outcomes, and pattern recognition. The HR department's employee recruitment is facilitated by screening resumes, scheduling interviews, and tracking applications. In addition, chatbots have a prime role in the hiring process by analyzing answers to determine if a candidate is an appropriate fit for the company or not. (Virginia 2021.)

Secondly, AI makes it possible to improve the customer experience for businesses. For many companies, consistent customer interaction fuels profit. Therefore, they have to pay high salaries to their staff members who provide assistance 24 hours a day. Since AI is getting smarter every year, chatbots can do more and more of the work that these people used to do. They can communicate with customers and deal with complex problems while putting less of a burden on IT resources to manage and maintain the contact center, resulting in an enhanced customer experience. (MacAraig 2019.)

AI helps businesses reduce operational costs. The goal of AI is to give remarkable experience from a mountain of unorganized information. This affects the cost of developing a business. AI can save time, remove simple assignments from the to-do list, and make employees more productive and valuable. Therefore, applying artificial intelligence automation in the company will save time, cut down on human error (which costs money), and enhance the customer experience.

However, it still has some disadvantages when launching AI in businesses. The most significant downside of it is that is an expensive investment. In long term, we see AI as having cost-cutting benefits for businesses. However, the initial setup for AI is expensive, as businesses must invest in AI frameworks, including the latest hardware and software. Training teams on how to utilize AI systems incur additional expenses. All of this makes the implementation and maintenance of AI systems costly.

2.5 The impacts of AI on society

Since AI become more popular than ever before, we all realize the great potential of artificial intelligence, it makes our lives easier and more convenient. However, some of us are idolizing it or have misconceptions about it. As a result, this chapter covers both aspects of using artificial intelligence.

Positive aspects of using artificial intelligence

- **Reducing Human Error:** Humans are prone to error when performing tedious and repetitive tasks, whereas correctly programmed computers can avoid such mistakes. Models of artificial intelligence make forecasts by applying algorithms to assemble data, thereby decreasing errors and enhancing precision.
- **Easily Manages Massive Data:** In a very short period of time, AI can work with massive amounts of data. It can capture quickly and extract suitable data for analysis. In addition, AI can interpret and transform these data for additional processing.
- **Mitigates Risks:** The application of AI in hazardous environments presents a significant advantage. AI systems can reduce the risks associated with such tasks for humans. For instance, AI-enabled robots can perform dangerous tasks such as coal mining, marine life exploration, assisting in natural disaster rescue operations, and so on.
- **Create more advanced jobs:** According to the "Future of Jobs Report 2020" published by the World Economic Forum, an estimated 97 million new jobs will be created in 26 countries by the year 2025. Nonetheless, these newly created jobs will necessitate new skills, necessitating substantial investments in "upskilling" and "reskilling" young people and adults. (Kande & Sonmez 2020.)

Despite AI's various benefits, there are a few drawbacks that should be kept in mind.

Evaluating artificial intelligence's disadvantages

- **Unemployment:** Although AI will create jobs in the future, it is also eliminating many of the traditional jobs currently performed by humans. According to the same report above, it shows that AI will have eliminated 85 million jobs in 2025. (Kande & Sonmez 2020.)
- **More likely to heighten human laziness:** As more and more tasks are automated and digital assistants become widely available, there will likely be an increase in human sloth as a result of our growing reliance on these tools. Humans' ability to perform

daily activities that call for memorization or analysis can be negatively impacted if AI is relied on too heavily for simple tasks like small calculations or remembering numbers or addresses. (Madhugiri 2023.)

In conclusion, there's no denying the fact that AI has improved our quality of life, but we should be aware of both the benefits and drawbacks of this technology. Regarding the bad aspects-it causes to society in general and businesses in particular, we should try to overcome them to minimize the harm it causes. in addition, good aspects should be developed further develop.

3 E-commerce Customer Experience

3.1 Understanding E-commerce

E-commerce or online trade is a word frequently used in business rules these days. It represents the practice of buying and selling goods and services entirely online. The e-commerce industry serves many different types of markets, and its transactions can be made by using a wide variety of smart devices, including pads, smartphones, and many more. Because nearly everything from books to clothes to daily stuff to financial institutions like investing in stocks and online banking can be purchased online, the e-commerce market is typically fiercely contested (Bloomenthal 2022.)

Nowadays, internet shopping is a prominent sales approach. E-commerce has transformed the ways customers shop for and consume products and services. Everyone is more and more using smart equipment to arrange orders that may be conveniently delivered to their locations. Consequently, It has transformed the commercial environment. Due to e-commerce, Amazon and Alibaba have gained immense popularity, forcing brick-and-mortar businesses to alter their business practices.

Statistics show that Global e-commerce sales could well surpass \$6,542 trillion, or 22% of the total retail market in the year 2023. (Chaffey 2021.) People spend a great deal of online shopping. As more customers avoid visiting physical stores as a result of the pandemic, e-commerce expansion has been boosted. As life returns to normal, several brick-and-mortar retailers have modified their websites to make online shopping more convenient.

The most popular E-commerce model types

Each e-commerce store operates on its unique business model. Choosing an e-commerce business plan can be difficult, especially for those with little to no experience in the field. In order to ensure the survival of the online shop and the steady growth of its revenue, it is crucial to pick the appropriate business strategy.

An online store's operational model has a lot of leeways to adapt to the specifics of its products, services, and corporate structure. Some of the most common types of companies are listed here.

- **Business-to-Consumer (B2C):** B2C companies sell directly to their end customers. Anything we buy as consumers in an online store is a B2C transaction. The important thing when businesses adopt s model is that the products and services are primarily aimed at individuals. (Bloomenthal 2022.)

- Business-to-Business (B2B): Similar to B2C, an e-commerce company can sell directly to a user. However, rather than being a customer, the user could be another business. Typically, business-to-business sales involve greater quantities and greater specifications. (Ashraf 2022.)
- Consumer-to-Consumer (C2C): This model is an e-commerce-specific concept. Users of these platforms (i.g eBay) can exchange, purchase, sell, and rent products and services. In every transaction, a small fee is paid to the platform. This business model is complex and must be carefully planned. Many platforms have failed, owing to legal issues.
- Consumer-to-Business (C2B): Another great idea is the C2B business model, which is popular because of platforms that help freelancers. In C2B, freelancers work on tasks that clients give them. Most of these clients are businesses, while most freelancers are single people.

3.2 The Impacts of E-commerce on Business

There's no denying that the ability to sell products online has contributed to the success and expansion of many companies. The advantages of e-commerce are numerous and it can contribute to a company's success just like those of any other business approach.

One of the most significant advantages of e-commerce for businesses is cost saving. Indeed, it is common knowledge that businesses typically invest a substantial amount of capital to develop and run a traditional or physical store. They have expenses such as location or lease payments, repairs, supplies, and labor. Including things like store layout, and sales equipment. More often than not, traders are afraid that they have invested too much money and will not be able to recover it if the business fails. However, none of these things are necessary for an online shop to function. Thanks to the variety of hosted solutions, for example, BigCommerce, Shopify, Wix, and so on, we now can easily create an e-commerce website with all functions as well as an appropriate budget. Since it requires far less capital, selling online is a fantastic possibility for sole proprietors and smaller businesses.

Secondly, e-commerce benefits businesses by permitting them to easily and diversely obtain detailed client data. It discloses customers' purchasing histories, demographics, and preferences, allowing firms to adjust products, services, or marketing methods to their needs. Companies can also use this data to improve the purchasing experience for their customers.

At the same time, with the help of the internet and e-commerce platforms, worldwide online purchasing is available for everyone. Therefore, businesses now can have a far greater opportunity to expand their consumer base internationally. Moreover, businesses can provide customers with flexibility. A highlight is that the product and services are available around-the-clock. As a result, goods or services can be offered anywhere and at any time.

Although e-commerce holds great potential, it is not without its drawbacks, which companies must weigh. First of all, with e-commerce, businesses can lack face-to-face interaction with their customer, which lead to lower loyalty of the customer. Customers are unable to communicate directly with the seller, which can breed mistrust. As a result, some customers are more cautious when shopping on the Internet, as they have numerous options and can compare them using information and product reviews provided by previous customers.

Furthermore, a possible drawback of online shopping is that customers may have to wait longer to receive their purchases. In contrast to brick-and-mortar stores, customers of e-commerce sites cannot simply "walk-in" and walk out with the item in their hands. If the product is out of stock, the wait time can be anywhere from a few days to a few weeks.

Regarding privacy and security concerns, the biggest drawback of conducting business online is the elevated risk to personal data. Customers are becoming more cautious to provide personal information to websites, particularly credit and debit card information. In actuality, cases of customer information theft caused by cybercrime have increased along with the development of the field of e-commerce. Therefore, as a customer opinion, it is essential for online stores to have a secure system in place to build customer trust.

In short, by using an e-commerce platform, customers and businesses get a lot of benefits such as saving time and cutting costs. Customers have more options to choose and compare from, as well as businesses have access to a larger customer base. However, e-commerce is not good, for instance, compared to shopping in-store, the speed of delivery of customers' online purchases may disappoint them. Despite certain drawbacks, e-commerce is a fast-expanding industry in which companies will continue to invest.

3.3 Customer Experience in E-commerce

Understanding customer experience and its importance in e-commerce

In e-commerce, customer experience (CX) is a significant determinant of a business's success or failure. It is shown by how a customer feels about their experience prior to, during, and then after shopping at your online store.

There are three primary components to the customer experience: service experience, brand experience, and product experience. (Heubel 2023.) However, in this thesis, we only learn about how AI is used by businesses to improve customer experience, especially in customer support (service experience). Therefore, the remaining components such as brand experience and product experience will not be mentioned in the next parts of the thesis.

The service experience is the support that businesses offer their customers through various channels of communication, such as phone, email, chatbots, etc. While sales and marketing can increase a business's revenue by helping sell more, excellent customer service is the attraction that will keep customers coming back. It is not only a game changer for companies but also one of the most essential components of overall customer experience and a key to keeping customers for the long haul.

Whether a customer is happy and stays loyal to a brand over time, leaves negative feedback online, or recommends the brand to others all depends on the service they receive. The service experience a company provides is the only way to ensure satisfied clients who will spread the word about your business and buy from you again and again. And we all know that keeping an existing customer for the long haul is much less expensive than constantly bringing in new ones.

There are myriad reasons why prioritizing the customer experience is crucial to the success of any business. Benefits include an increase in customer loyalty, a rise in satisfied customers, word-of-mouth advertising, the potential to establish one's reputation as a trustworthy online retailer, and so on.

In actuality, many kinds of research show that the quality of a company's customer service is more important to customer retention than either the price or the quality of the product itself. Eighty percent of U.S. respondents in PwC's 'Future of Customer Experience' survey agree that providing courteous service is crucial to creating a positive impression on customers. Moreover, Walker's found in a recent study that 86% of buyers would pay more for a better CX. Dimension Data also found that when companies focused on customer experience (CX), their customers were more loyal and their sales went up. (Heubel 2023.)



Image 3: The comparison between product and price experience and CX (Heubel 2023.)

Currently, the e-commerce industry has been developing rapidly which leads to high competition in this field. However, some online businesses still can make their more stand out than others by providing a better customer experience. They understand the importance of customer experience in driving shopping and promoting their brands and products. Thus, they put the customer at the center of product and service development. There are a lot of ways to improve it, but applying AI technologies is considered the most effective way to help online businesses to do so. In the next chapter, some highlighted AI applications in e-commerce are provided to evaluate their usefulness and applicability to businesses and consumers.

4 Highlight AI Applications in E-commerce

Artificial intelligence has been extensively developed and implemented in the business world, particularly in e-commerce. The advancement of AI has wowed audiences, drawing more focus on the e-commerce sector as a whole.

This section will detail the use of AI in e-commerce and assess the benefits to businesses and consumers.

4.1 AI Assistants and Chatbots

Several businesses incorporate AI and Machine Learning into their operations. By utilizing a chatbot or AI-powered virtual assistant, businesses can not only increase revenue but also save money and provide superior customer service. According to Gartner, chatbots saved \$8 billion in business expenses by 2022. Therefore, it is not surprising that virtual assistants and chatbots have become increasingly popular.

They share numerous similarities. While virtual assistants are designed to handle a wide range of requests, chatbots typically provide more specialized services, but both enhance the provision of individual assistance. A virtual customer assistant uses AI to comprehend a customer's request and answer back to it in real time. This digital assistant can work on its own or with a live customer service representative. While a chatbot is a specific technology that allows customers to hold a conversation with a computer. The bots can learn to respond to inquiries, give suggestions, and make reservations just like a human. All these chatbots and virtual assistants use Natural Language Processing to figure out what a user wants or mean when they ask a question or make a request and then respond conversationally. (Aws 2019.)

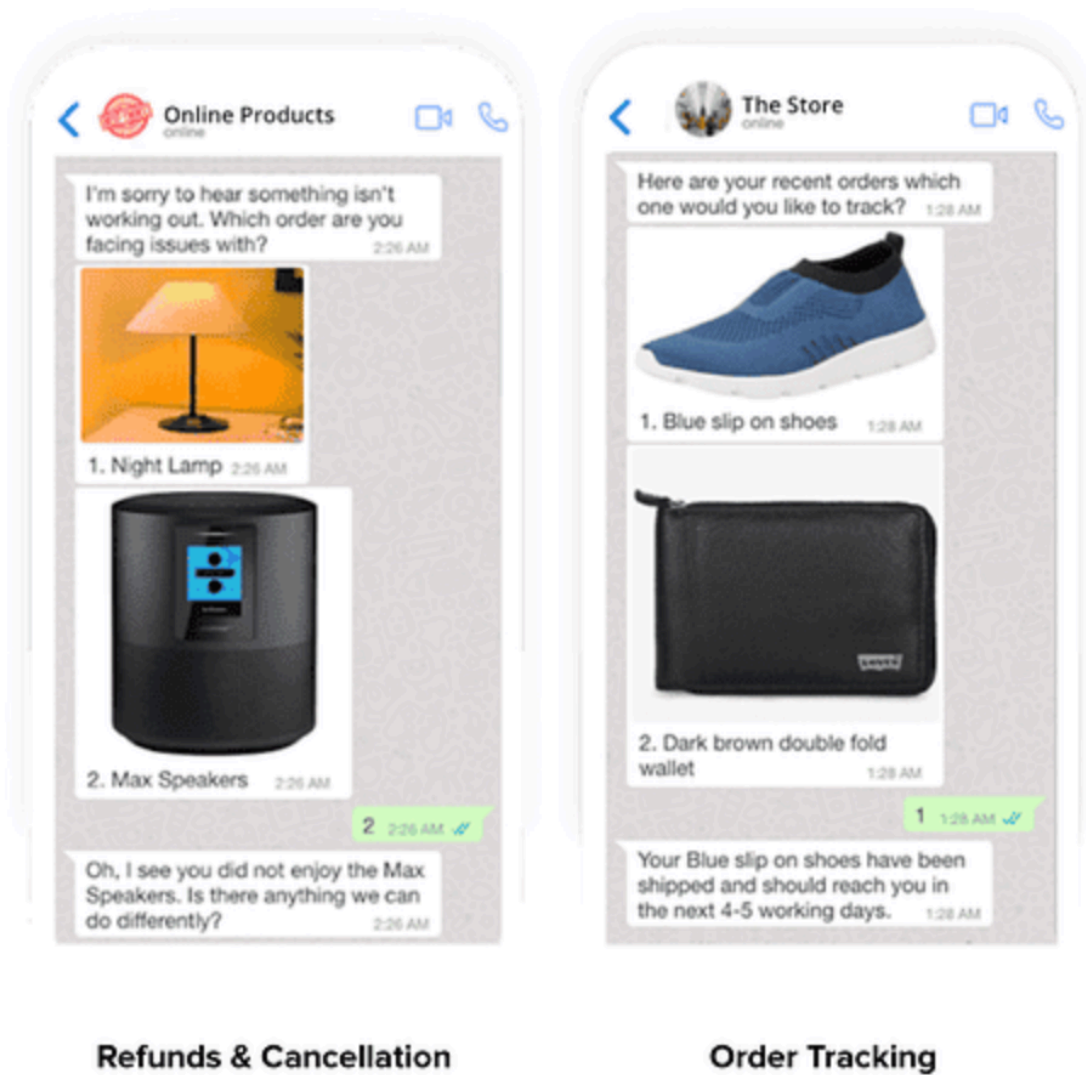
Today's consumers demand a personalized shopping experience. Customers are more likely to feel a connection to a company's brand if they are treated like individuals. Receiving a service tailored to their needs will make them feel important, which in turn will improve the likelihood that they will make a purchase. Accenture found that when customers are acknowledged, remembered, and given appropriate advice, 75% are more likely to make a purchase. Or the findings of a Forbes survey suggest that 80% of consumers are more likely to purchase from a company that tailors its offerings to the individual needs of its customers. In addition, according to an Epsilon report, 80% of customers are much more inclined to engage with a company that offers them a personalized experience. (Clark 2021.) Virtual shopping assistants or e-commerce chatbots can direct the consumer through the purchasing process and provide highly individualized product suggestions. As virtual sales

agents, AI-powered eCommerce chatbots or virtual assistants can replicate the in-store shopping experience, engage with customers in new ways, increase customer loyalty, improve the customer experience of the brand, and sales process efficiency.

Take Netflix as an instance. Rather than letting customers choose from thousands of box sets and movie titles, Netflix provides a much more targeted selection of content based on the subscribers' individual tastes. This feature improves the user experience while also saving time. Netflix was able to reduce its annual cancellation costs by about a billion dollars thanks to this feature. (Simplilearn 2022.)

Moreover, utilizing virtual assistants or chatbots in business means less manual labor for customers, while they provide 24/7 customer service and enhance the overall experience of an e-commerce website. In the world of online commerce, AI systems work around the clock. With the machine's assistance, a company can give the impression to its customers that it is available across all channels at all times to meet customer requirements. This is especially helpful if the company operates on a global scale and its customers are spread across multiple time zones. However, what if customers have inquiries or demands that are beyond the scope of chatbots and AI assistants? Then, they help customers get human help as soon as possible.

For example about WhatsApp, WhatsApp's response time is nine times faster and easier than a phone conversation. The majority of customers (70%) prefer to send a message instead of making a phone call. WhatsApp's direct messaging features are helpful for consumers and help businesses cut down on expenses. Approximately 70% of WhatsApp messages are opened. High volumes of customer service calls can be easily redirected to WhatsApp. Reduce operational expenses by a significant margin by chatting with potential customers and answering their questions round-the-clock. The two most common support use cases—order tracking and refunds/cancellations—are both easily and quickly handled in WhatsApp, it shows in the image below. (Ashta 2020.)



Refunds & Cancellation

Order Tracking

Image 4: WhatsApp Support (Ashta 2020.)

In conclusion, both businesses and customers benefit in several ways when these using AI-powered virtual assistants and chatbots:

- **Faster and more efficient customer service:** quick and personalized responses to customer inquiries, which can reduce wait times and enhance the speed and efficiency of customer service.
- **24/7 availability:** allow customers to access support and information whenever they need it.
- **Convenience and ease of use:** provide a convenient and easy-to-use interface for customers to search for products, place orders, and track shipments.
- **Increased customer loyalty:** By providing a seamless and personalized shopping experience, virtual assistants and chatbots can increase customer satisfaction and loyalty, leading to repeat business and positive word-of-mouth recommendations.

- Improved accuracy: AI-powered chatbots and virtual assistants are less likely to make errors in their responses than human customer service representatives, leading to greater accuracy and customer satisfaction.

Overall, AI-powered virtual assistants and chatbots help businesses provide better customer experiences, which can ultimately drive business growth and success.

4.2 Customer Behavior and Sales forecasting

There's a lot of data out there now, and it's hard to keep track of it all, AI might be the answer to this problem. Also, because customers' preferences and needs are always changing and getting more complicated, businesses can no longer rely on old ways of doing business to create growth. Therefore, businesses utilize AI as a potent instrument for predicting customer behavior in order to enhance the overall customer experience.

AI offers businesses the opportunity to predict their clients' actions in real time. For instance, AI algorithms may monitor a customer's prolonged stay on a specific product page, which could signify their nearness to completing a purchase. Armed with this information, AI technology can act accordingly, such as by dispatching a compelling email or website notification aimed at spurring the customer to finalize the purchase.

The utilization of AI further provides a comprehensive understanding of customer decision-making processes. AI algorithms are capable of categorizing customers based on the data gathered, including the probability of their returning to place additional orders. These insights can be leveraged to optimize marketing efforts and effectively target the appropriate users at the opportune time. Additionally, AI has the potential to provide managers with pertinent information regarding customers who are at risk of departing, by way of its ability to calculate the probable customer lifetime value. This knowledge can be utilized to engage with customers and persuade them to maintain a relationship with the company, in turn resulting in an increased customer lifetime value and heightened online sales. (Danielkievich 2022.)

Moreover, AI can also be used for trend and product forecasting. By analyzing historical data on past trends, and consumer behavior, AI algorithms can detect emerging trends and anticipate which products are likely to be successful in the future. For instance, AI algorithms can analyze customer data to determine what products are currently popular and what types of products are trending. The technology can then make predictions on what products are likely to be popular in the future based on this data. This can help eCommerce businesses make more informed decisions when it comes to product development, marketing, and other aspects of their operations. (Niu 2021.)

For example about Walmart, It uses AI algorithms (XGBoost algorithm) to analyze data on sales trends, customer behavior, and market dynamics to predict which products are likely to be successful in the future. By analyzing this data, Walmart is able to identify emerging trends and stock its shelves with products that are likely to be in high demand. (Niu 2021.)

In conclusion, AI helps businesses analyze customer behavior, forecast sales, and make informed decisions about future operations by identifying patterns and trends in real time. This enables businesses to create targeted marketing strategies, optimize sales efforts, and reduce the risk of stockouts, resulting in increased revenue and profitability. AI has the potential to benefit both businesses and customers.

4.3 Virtual Searching

The advent of computer vision technology and the widespread use of mobile shopping has given rise to a significant trend, namely, the utilization of image recognition software for product search. Through the use of mobile applications or web browsers, consumers can streamline their product search process, thereby reducing the cognitive and physical effort required to achieve their search objectives. Visual search enables customers to initiate the search process by simply submitting an image of the desired product. For instance, a customer who intends to repurchase a facial cream that is almost exhausted may choose to shop online. In this scenario, the customer captures an image of the product and initiates a visual search, which is facilitated by an image recognition engine. The engine delivers the most probable match based on the input image, thereby significantly reducing the customer's effort, which is limited to capturing and uploading the image to the search box.

Besides using images to search, we can now also use our voice to shop. Voice shopping in e-commerce refers to the process of using voice-enabled devices to purchase products or services online. With the rapid advancements in voice recognition technology, consumers can now use voice-activated assistants such as Amazon's Alexa, Google Assistant, and Apple's Siri to order products online. By 2024, According to Statista, there will be more than 8.4 billion voice assistants in use worldwide, and over 51% of consumers expect to use theirs for online shopping. (Laricchia 2022.)

Voice shopping offers a convenient and hands-free shopping experience, especially for customers who are unable to use traditional input methods such as typing or clicking. Additionally, voice shopping can help expedite the purchasing process, as customers can easily place orders while they are engaged in other activities such as cooking or driving. The rise of voice shopping is expected to transform the e-commerce landscape, as more and more consumers are adopting this innovative technology for their shopping needs. With

the use of AI, people can now use their phones or smart speaker to make purchases simply by using their voices.

In conclusion, the emergence of AI solutions such as voice and picture searching has provided customers with a range of innovative options to locate products that may not be easily discoverable through traditional search methods. By expanding the search options available to customers, these AI-powered technologies offer a more efficient and personalized shopping experience, enabling customers to identify products that align with their preferences and unique ways of thinking. As AI continues to advance, it is expected that more innovative solutions will emerge, enhancing the shopping experience and transforming the way customers interact with e-commerce platforms.

4.4 Privacy and Cybersecurity

As the information regarding privacy and security concerns as mentioned in section 3.2, now AI offers e-commerce entrepreneurs a promising avenue for bolstering the cybersecurity of their websites. Through AI, websites can rapidly identify instances of fraudulent activity and thereby mitigate the risks of data breaches that could compromise the sensitive information of both businesses and their customers. Moreover, AI can be leveraged to bolster the encryption protocols of websites and applications, thereby providing a secure online payment environment for customers.

One way AI helps prevent fraud is by using predictive analytics to identify anomalies in customer behavior. For example, if a customer suddenly starts making large purchases with a new credit card or from a new location, it may trigger an alert for potential fraud. AI can also analyze customer data to identify common fraud patterns and behaviors, such as purchases made at unusual times of the day or from unexpected locations.

However, it is important to note that AI itself poses privacy and security risks, especially if it is not developed and implemented properly. Therefore, it is essential to conduct thorough risk assessments and ensure proper governance and oversight of AI systems. This includes implementing best practices for data management, regularly monitoring AI systems, and ensuring transparency and accountability in the use of AI in privacy and cybersecurity.

5 Empirical Research and Data Analysis

5.1 Data Collection

The process of data collection for this study took place in March of the year 2023. At the inception of March, a universal invitation was dispatched to solicit participation in the online survey. The survey was conducted utilizing a structured questionnaire containing a total of twenty questions, with a completion time estimated to be between 3-5 minutes. The questionnaire was organized into three major sections, the first two of which sought to gather rudimentary information regarding the participants. The second section featured a series of multiple-choice queries, alongside a brief open-ended question concerning everyone's attitude toward the applications of artificial intelligence in everyday situations. The final part aimed to provide a more in-depth look at AI and how it relates to e-commerce. Participants were asked for examples of E-commerce features that relate to AI applications and what they thought about it based on how well it met their needs.

The key phases of data collection are outlined in the following table:

Table 1: Timeline of the data collection process

Timeline	Action	Content
January 2023 to February 2023	Research on the theoretical part	Acquiring the theoretical background of the thesis.
1st – 19th March 2023	Online survey	Gathering data from the participants.
20th – 27th March 2023	Analysis of the received results	Addressing research problems. Formulating a discussion and conclusion.

In December 2022, the development of the thesis commenced after selecting an appropriate subject. The author began by outlining the overall structure of the paper through a thesis plan. To better explain the major issue presented, then the writer narrowed down and explicitly specified the research topic and questions. Subsequently, the theoretical phase was concluded to provide background information for the investigation. In February 2023, an online survey for the thesis was conducted by the author and distributed through various online channels such as Facebook, WhatsApp, and Telegram. The reasons why those digital platform were chosen to be as the survey distribution channels are explained clearly in section 6.2 of the thesis. The survey closed on February 20th, 2022, with 95

participants, consistent with the initial planned target. Finally, the author collected and analyzed the survey data to complete the analysis and findings for the thesis.

5.2 Data Analysis

Ninety-five valid responses were obtained from a 20-question survey that was conducted successfully. The primary objective of this survey was to scrutinize the attitudes, satisfaction, and overall perception of humans towards AI in both everyday life and e-commerce settings. The outcomes of this survey, coupled with the theoretical framework, serve as a basis for building ideas and concepts for the thesis.

Section 1: Participants' information.

The study received a total of 95 responses, the majority of which were provided by male participants, comprising 61.6% of the sample. Furthermore, a small percentage of 8.4% chose to withhold their gender identity.

The age distribution of the survey respondents revealed that the majority, comprising 63.7% of the sample, were between the ages of 18 to 25, while 29.5% belonged to the age group of 26 to 35, primarily representing Gen Z and Millennials. The remaining respondents over the age of 45 constituted a much smaller proportion of the sample, comprising only 4.2%.

The survey results have been presented in the form of 19 graphical representations, each of which is explained in detail in the appendix section.

Section 2: The awareness of AI in daily life

How frequently do you hear AI mentioned in your daily life?

The objective of the survey was to examine individuals' general attitudes and understanding regarding artificial intelligence (AI). The findings disclosed that a considerable proportion of respondents (61.1%) reported often exposure to mentions of AI, while around one-third (30.5%) acknowledged sometimes encounters with this subject in their media consumption and daily discussions. These results suggest that AI has gained significant visibility in the broader media spectrum and has become a popular topic of conversation beyond its associated domains.

Are you interested in AI?

The study queried the participants' level of interest in the field of AI, and the results indicated that 21.1% of the respondents did not consider AI to be a more fascinating domain than other subjects. In contrast, the majority of the respondents, amounting to 69.4%, demonstrated varying degrees of interest in AI, ranging from interest to very interest. A

relatively small proportion of the participants, constituting 9.5%, displayed no interest or only slight curiosity in AI. The findings suggest that with the development of AI, more and more people know about AI, consider it an interesting topic to discuss, and are eager to study people. While the majority of the participants displayed some interest in AI, there are also individuals who are less interested or indifferent towards this field. In addition, the results also indirectly show that without a doubt, the survey participants know about AI.

In your opinion, what industries or areas do you think AI is currently used in? (choose all possible answers)

The survey participants were asked to indicate which industries or areas they believed were currently utilizing AI technology. Figure 5 reveals that "Agriculture" received the least amount of responses with only 37 votes, while "Education" was the most commonly selected option with 80 votes. The second most frequently chosen application of AI was in the realm of business, for example, e-commerce and marketing, which garnered 79 votes. Healthcare and Information Technology were also popular choices with 78 and 76 votes respectively.

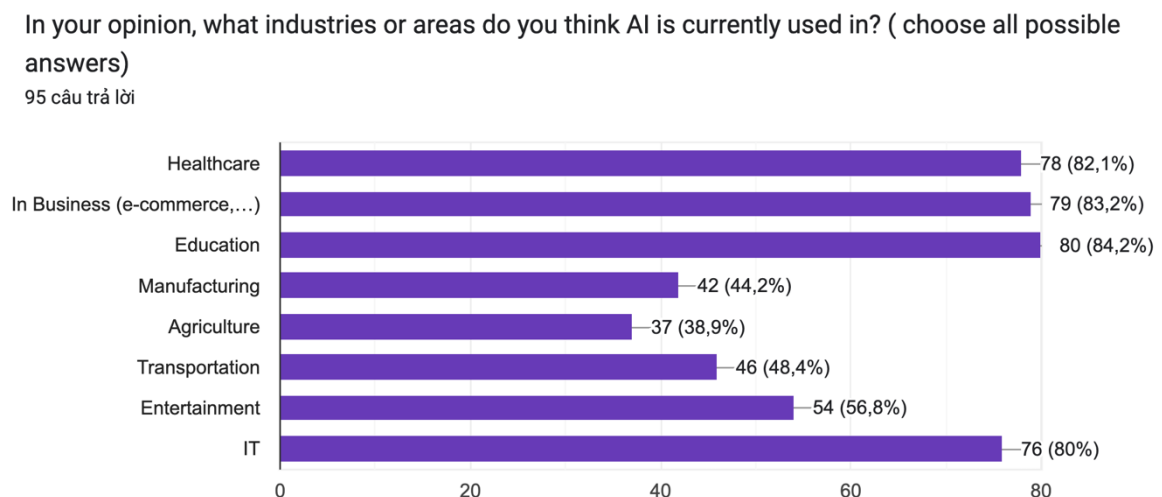


Figure 5. AI implementation industries.

The results of this question indicate that the participants have a high level of awareness regarding the utilization of AI in various aspects of life, including daily activities. It is evident from the responses that the participants primarily associate AI with education, although they are also mindful of its application in business.

Can you recognize AI in your daily life?

Despite knowing the extensive usage of AI, Figure 6 indicates that a majority of individuals, 58.9%, lack confidence in their ability to identify AI in practical settings. Nevertheless, there

is a positive outcome as almost a third of the participants profess to be able to recognize AI, in contrast to the 7.4% who admit they cannot do so.

Can you recognize AI in your daily life

95 câu trả lời

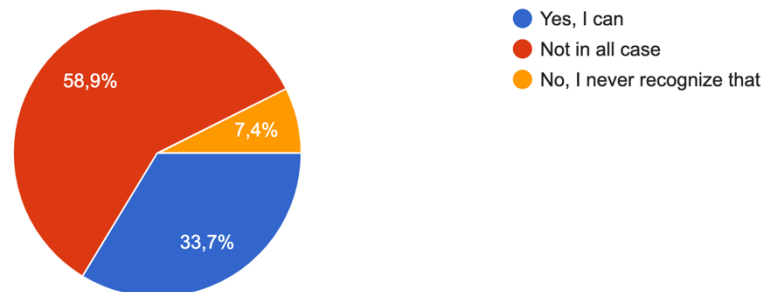


Figure 6. AI recognition level in life.

Next, two stereotypical questions collected data on the attitude of participants toward AI.

Would you be comfortable with AI making a decision that could significantly impact your life?

Figure 7 suggests that a significant portion of the respondents (40.2%) would not feel comfortable with AI making a decision that could significantly impact their lives. This indicates that there is some level of apprehension or concern among individuals about the potential consequences of delegating such important decisions to machines. On the other hand, a smaller proportion of the respondents (30.5%) chose that they would be comfortable with AI making decisions. This suggests that there are individuals who trust in the ability of AI systems to make unbiased and accurate decisions based on data and algorithms. A significant percentage of respondents (25.3%) chose to remain neutral on the question, which indicates a lack of strong opinions or uncertainty about the issue.

Would you be comfortable with AI making a decision that could significantly impact your life? (e.g: deciding whether you get job or loan)

95 câu trả lời

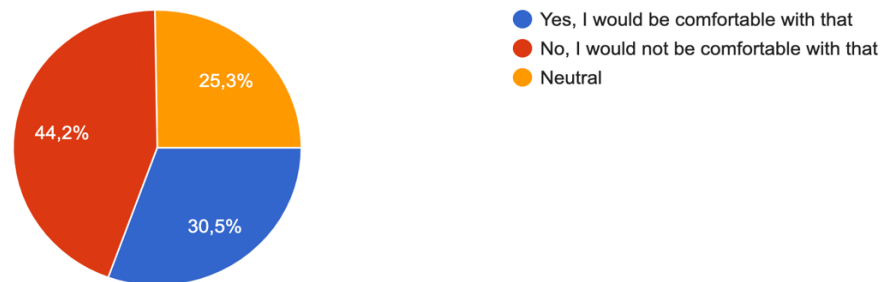


Figure 7. AI's decision-making.

In your opinion, can AI endanger humanity in the future?

The following question is about the attitude of everyone toward the dangers AI can bring to humanity. Based on the responses shown in figure 8, Based on the responses, it seems that there is a significant level of concern about the potential risks and dangers of AI. Almost half of the respondents believe that AI has the potential to endanger humanity, while only a fifth believe that it cannot. This suggests that people are generally aware of the possible negative consequences of AI and are taking the issue seriously. However, the fact that a significant percentage of respondents are uncertain about the potential risks indicates that there is still much uncertainty and debate surrounding the topic, and more education and discussion may be necessary to raise awareness and understanding.

In your opinion, can AI endanger humanity in the future? (some examples of how AI could endanger humanity: Autonomous Weapons, Superintelligence, etc.)

95 câu trả lời

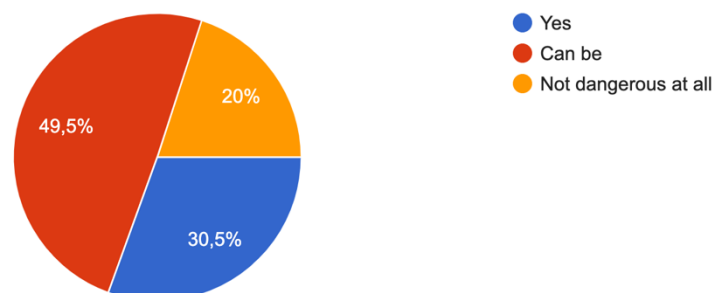


Figure 8. The attitude toward the dangers AI can bring to humanity

Do you think, it's important for people to learn about AI and its implementation? Why?

The last question in section 2 is a short answer to gather unbiased opinions from participants. In this question, the participants were asked their thoughts about the importance of AI for everyone to learn more. The results are aggregated into two streams of opinions. The first stream of opinions, the strongest stream in this question is the participants say “yes” to the importance of AI and should learn about it.

There are some highlight answers from participants:

“Yes, because AI is the new technology trend, learning this field means that we have abilities to attract the latest tech of the world.”

“I think it's very important to learn about it, or at least know some basic stuff about it especially since it's becoming very integrated in our day to day life that it has become very natural to us to use AI.”

“Yes, we should all know about the process of receiving and handling things and how the AI do that for our own risk because of their independence logic and the way of solving problem.”

“Yes, I think it's very important because nowadays digital is developing very strongly and people need to learn how to use and control AI to serve their lives.”

However, there is a much small group of participants who feel AI is not really important for everyone to learn about it. There are some answers in this stream of opinions:

“In my personal opinion, NO! Because not everyone has access to advanced technology such as AI and moreover AI has only recently emerged, so only a small group (30% of the world's population) knows what AI is. In addition, only some professions or fields can use AI because AI is not "emotional" so they will work very inflexibly and a bit "mechanically".

“How does that work? and what think we need from AI??”

In conclude, our survey's findings show that many people, especially young adults between the ages of 18 and 35, possess a restricted understanding of artificial intelligence (AI) viewing their knowledge as unreliable and inaccurate. Especially, they are generally skeptical of their ability to realize AI in daily life. As a result, many express concerns about the potential dangers of AI to human life. Nevertheless, respondents acknowledge the positive impact of modern technology on their daily lives. According to the survey results, a large number of people are interested in AI technology topic and want to learn more about it. In this case, AI is going to be a remarkable topic in the year 2023 to discuss.

Section 3: The applications of AI in e-commerce and customer satisfaction

The final segment of the study was designed to offer a comprehensive investigation of the interrelationship between artificial intelligence (AI) and e-commerce. Specifically, study participants were requested to choose the instances of e-commerce features that utilize AI applications. They were also asked to evaluate their satisfaction based on their experiences with specific instances, utilizing a rating scale that ranged from point 0 to 5, with associated responses that ranged from "never used AI for this as far as I know" to "strongly agree." In addition, a set of business-oriented questions was included to gauge the degree to which participants considered AI to be universally applicable across the e-commerce industry, as well as to assess whether investments in AI applications were considered worthwhile for companies.

According to the second section, people chose business as the second most popular area for AI implementation, so the first question of this section demonstrates the participants' knowledge about AI applications in business, especially in e-commerce. The question is asking for examples of E-commerce features that can be related to AI applications, and the answer options are presented as multiple-choice options. The "Personalization" option received the most responses with 80 votes, suggesting that many respondents believe that personalization is a crucial feature that can be enhanced by AI in the context of E-commerce. This result is not surprising, as AI can be used to collect and analyze data about customers' preferences, behavior, and purchase history, which can help E-commerce businesses to provide more personalized product recommendations, marketing messages, and customer service. The second most popular choice, "supply chain and logistics," garnered 77 votes, indicating that many respondents recognize the potential of AI to optimize and streamline the E-commerce supply chain. The third most popular choice, "Business operation feature," received 56 votes. Finally, "Business - Customer interaction" received the least amount of responses with only 52 votes.

Moreover, the participants were aware that customer experience plays an important role in the development of businesses, especially online businesses (95.8%). Despite the understanding that AI brings a lot of benefits to businesses, some participants are still puzzled by AI's ability to enhance customer experience. Figure 9 shows the results that 40% of the participants are sure that AI can help businesses improve customer experience. 34.7% of participants chose "most in all case" and "a little of the case" with 18.9%. A small group of them, unsure of their understanding of AI applications in this area, chose "Maybe" (6.3%) and no one chose "No" for this question

In your opinion, can AI applications in online shopping platforms (e-commerce) improve customer experience?

95 câu trả lời

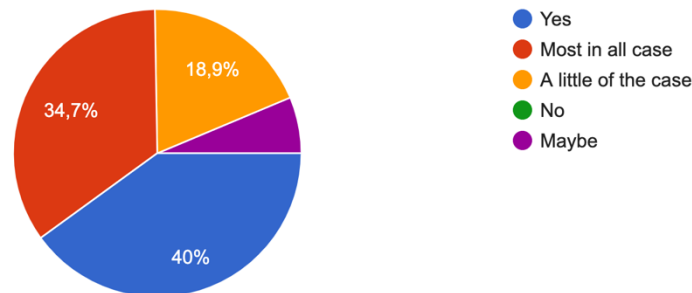


Figure 9. Participants' opinions about AI can improve CX.

Six questions were developed to collect data on how well AI support serves consumers in e-commerce and to determine their satisfaction levels with the online business platform services they have used. The questions include particular instances of AI applications in e-commerce, like recommendation systems, delivering exceptional customer service, and utilizing AI-based virtual assistants (chatbots). The aim is to assess the efficiency of AI in enhancing the e-commerce experience for customers. The results of the survey exceeded expectations, with between 70% to 80% of respondents either answering or strongly agreeing with statements related to the aforementioned subjects. Consistent with previous research, companies that utilize AI can make better decisions and improve the quality of their customer service. Employing AI as a competitive advantage has proven successful in the e-commerce industry, leading businesses to achieve success.

From participants' experiences with AI applications, almost everyone was satisfied with the overall performance of the its features in the online shopping platform. At the end of the survey, the majority of participants (81.1%) consider investing in AI applications for online business platforms to be either completely or mostly worthwhile in some cases. This indicates that everyday consumers believe that they will also benefit if companies invest in AI applications in their business.

To summarize, it is advantageous for companies to be transparent about their use of AI and share their AI use cases with customers. Customers view AI positively and consider it a worthwhile investment. Incorporating AI technology into business operations can also enhance the company's image as a customer-oriented organization. Moreover, by openly discussing AI projects, companies can reassure customers who are hesitant about the technology. Skeptical customers can be convinced of its benefits by demonstrating its

usefulness and providing clear explanations of its applications. Many customers are convinced by the potential advantages. To advance innovation on a global scale with the next generation of technology, further investment in artificial intelligence is necessary, and customers are interested in learning more about AI technologies.

6 Findings and Conclusions

To conclude the thesis, this section provides answers to the questions raised by the thesis. The sub-research questions will be addressed first, followed by the solutions to the main thesis question.

6.1 Answer the Research Questions

Sub-question 1: What benefits and disadvantages do applying AI in e-commerce provide businesses and their customers?

Applying AI in e-commerce can provide numerous benefits to both businesses and customers, including improved customer service, reduced cost, and enhanced supply chain management. AI-powered tools can analyze customer data to provide personalized recommendations and offers and optimize inventory management that leads to improvement in customer service. However, AI in e-commerce can also have some drawbacks, such as privacy concerns, and significant investment costs. Therefore, businesses must be aware of the potential benefits and drawbacks of using AI in e-commerce and implement it with caution to ensure customer trust and loyalty.

Sub-questions 2: What are the highlights applications of AI in e-commerce in the real world?

Overall, these four key categories of AI applications in e-commerce can greatly enhance the customer experience and drive business growth. Firstly, personalized solutions are an essential category of AI applications in e-commerce, enabling businesses to enhance customer experiences through tailored marketing messages, personalized content, and customized products and services. By using customer data, AI technologies like machine learning and natural language processing can analyze customer behaviors and preferences, allowing businesses to make personalized recommendations and offer personalized experiences to customers. Virtual assistants, recommendation engines, and chatbots are just a few examples of how personalized tools can be utilized in e-commerce. Virtual assistants can interact with customers in real-time, providing personalized recommendations and assistance. Recommendation engines can suggest products to customers based on their browsing and purchase history, while chatbots can provide customer service and support through conversational interfaces. By leveraging these AI-powered tools, e-commerce businesses can build stronger relationships with their customers, improve customer satisfaction, and ultimately drive sales and revenue. Personalization is becoming increasingly important in e-commerce, and businesses that

can offer personalized experiences will have a significant competitive advantage in the marketplace.

Second, businesses face challenges in forecasting customer behavior and predicting the impact of trends. However, with the help of AI technology, they can analyze user engagement and stay up-to-date with the latest trends through social media platforms, making this task much easier than before.

Thirdly, the utilization of virtual searching allows users to conduct elaborate searches via voice or image inputs. Additionally, the implementation of recognition software can be leveraged across a multitude of applications. Such technology has the potential to greatly enhance and streamline various industries, leading to increased efficiency, accuracy, and productivity.

Finally, privacy and cybersecurity is an important concern to both businesses and their customers. With the exponential growth in data volumes and the complexity of cyber threats, AI can help to detect and respond to security threats more efficiently and effectively. A company has a strong cybersecurity, which can build customer trust.

Sub-question 3: What are customer perceptions of AI uses in their daily life and e-commerce?

The survey results indicated that customers responded favorably to the implementation of AI technologies in both their daily lives and in e-commerce. The survey collected data on customers' perceptions of AI in general and its application in e-commerce. The findings revealed that while customers have a satisfactory level of awareness of AI, many do not fully comprehend it or recognize it in real-life situations. However, customers generally had a better understanding of AI in e-commerce than AI in general. Overall, customers perceived AI applications positively, suggesting that they could be an effective tool for businesses, particularly in the online business sector. Additionally, customers believed that AI would be a good investment for businesses seeking to improve customer experiences and expressed an eagerness to learn more about it.

Main question: How businesses can use AI to improve the customer experience in E-commerce?

Following the completion of three sub-research inquiries, it is clear that businesses have several options for utilizing AI to improve the e-commerce customer experience. As AI continues to evolve with the customer at the forefront, businesses that want to offer the best possible shopping experience on their e-commerce platform should consider the benefits

of artificial intelligence and machine learning. By doing so, they can leverage consumer and corporate data more effectively to develop a viable future strategy.

6.2 Validity and Reliability

Based on the authors' primary data, it is possible to conclude that the research data is both legitimate and credible. The author created a set of inquiries for the online survey that was distributed to participants ranging in age from under 18 to over 45 years old through various digital platforms, including Facebook, WhatsApp, and Telegram. The survey distribution channels were chosen for the survey for a few reasons. Firstly, these are all widely used messaging and social media platforms, which means that the survey has the potential to reach a large and diverse audience. Secondly, these platforms all offer easy and convenient ways to share links and gather responses from participants. It's important to note that while these channels were chosen for their potential to reach a large and diverse audience, the reliability of the survey data ultimately depends on the quality of the respondents and their responses. Additionally, the survey may not be representative of the overall population, as it relies on self-selection from those who chose to participate. However, efforts were made to ensure that the survey was distributed through multiple channels to increase the likelihood of reaching a diverse set of participants.

Furthermore, the survey was anonymous, with no personal information provided by the author, and no incentives were promised or offered to survey respondents. As a result, the author had no influence on the responses. The survey questions were based on credible research and were presented in English.

Additionally, the author relied on secondary sources such as books, journals, news articles, and other reliable sources to support their research. The list of references includes several sources of theoretical explanations.

The primary goal of this thesis was to answer the research questions and subquestions. The purpose was accomplished through the use of primary and secondary data, as well as the findings and conclusions presented in the thesis, as the main research question was effectively answered.

6.3 Suggestions for Further Research

The study has focused only on the applications of AI in e-commerce platforms in general and concentrated only on improving customer experience. AI is constantly growing, and more and more new applications are being created and developed. Thus, it is necessary to

update new thing surround. It is recommended that further research be conducted on other artificial intelligence applications such as AR, VR, and ChatGPT.

Moreover, there are so many industries and areas where being applied AI technologies. Therefore, studies which focus on other industries are also interesting topics to research.

In other cases, as I mentioned the disadvantage of applying AI technologies in business is a high investment in the beginning. It is the most considerable problem for small and medium businesses that want to employ AI in their online business platforms because they have low capital investment. So the same topic and area of this study can be conducted with more calculations about investment such as ROI and expenses for given timeframes.

7 Summary

The thesis aimed to enhance comprehension of artificial intelligence, e-commerce, how the importance of customer experience, and how businesses can use AI applications to improve customer experience in e-commerce. The primary goal was to offer a solution to the main problem presented in the thesis, as well as the sub-research topic introduced previously. The use of an extensive range of literature sources enabled the accomplishment of both theoretical and empirical research.

The research involves both qualitative and quantitative data collection methodologies, along with a deductive research approach. The study commences with the theory section, which encompasses three theories for examination: an overview of Artificial Intelligence, a fundamental understanding of e-commerce customer experience, and noteworthy AI applications in e-commerce with examples from prominent businesses. These theories are utilized to demonstrate how AI influences e-commerce.

The fifth section of this thesis is Empirical Research and Data Analysis. This section involves primary data collected through an online survey distributed to participant groups on Facebook, WhatsApp, and Telegram. The questionnaire was analyzed after it was completed. The online survey was conducted to assess customers' attitudes toward artificial intelligence and their perceptions of AI applications in their daily lives and e-commerce. The study findings showed that respondents perceived their information to be unreliable and inaccurate. As a result, many expressed concerns about the potential dangers of AI to human life. However, respondents recognized the positive impact of modern technology on their daily lives. According to the survey results, a significant number of people are interested in AI technology and want to learn more about it.

The conclusion chapter offers responses to the research questions, along with a section that validates and ensures the reliability of the research and proposes ideas for future research. This final chapter provides a summary of the thesis.

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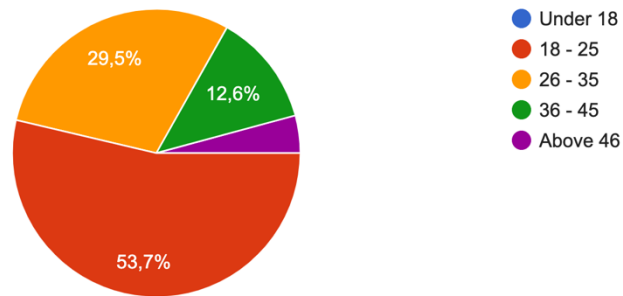
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Appendices

Appendix 1. Survey Result

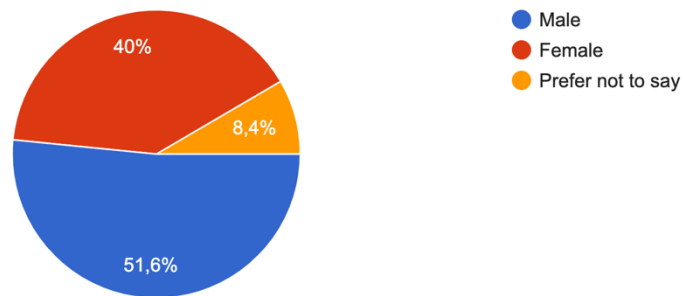
What is your age?

95 câu trả lời



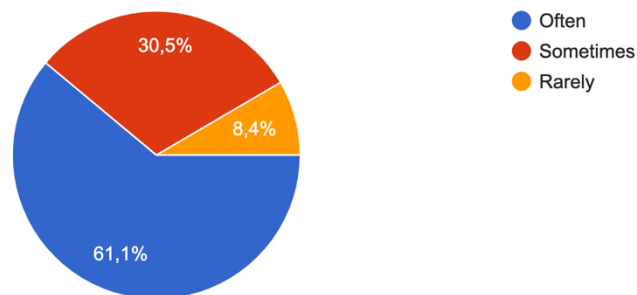
What is your gender?

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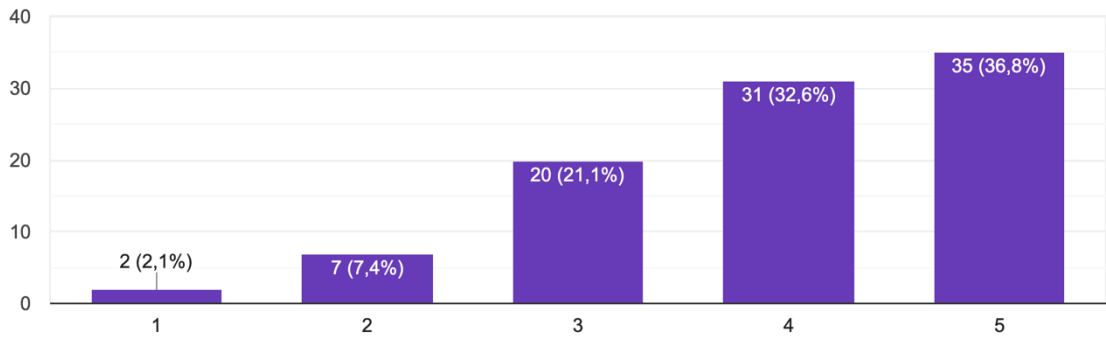
How frequently do you hear AI mentioned in your daily life?

95 câu trả lời



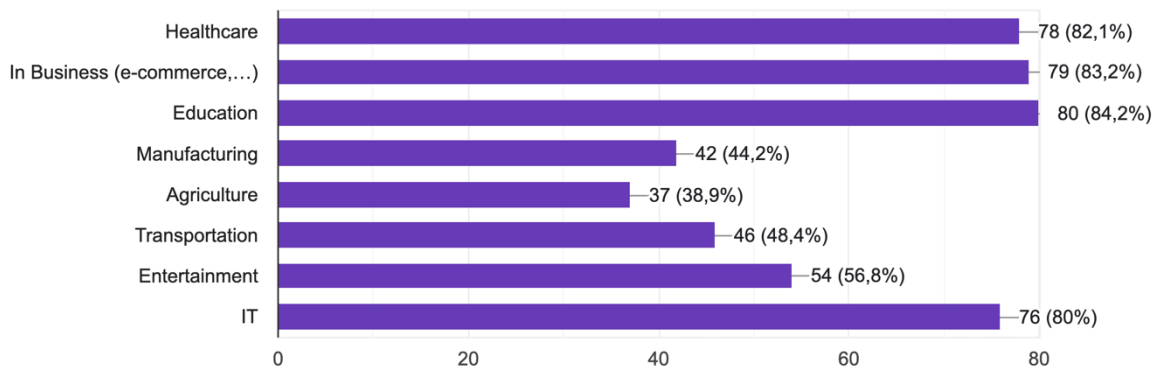
Are you interested in AI? (scale from 1: not interest at all - 5: very interest)

95 câu trả lời



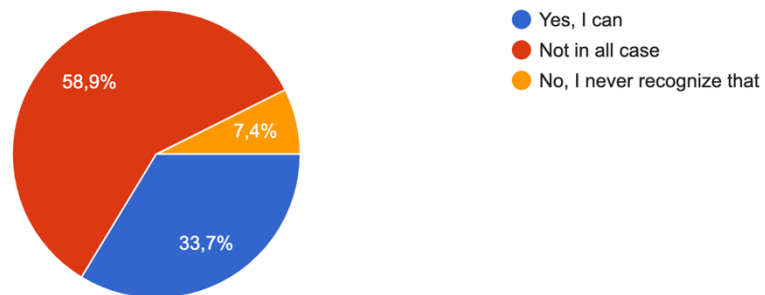
In your opinion, what industries or areas do you think AI is currently used in? (choose all possible answers)

95 câu trả lời



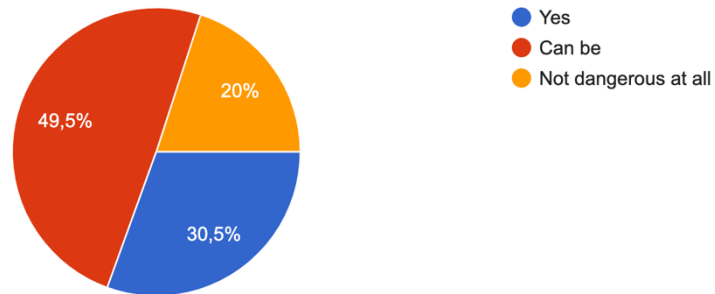
Can you recognize AI in your daily life

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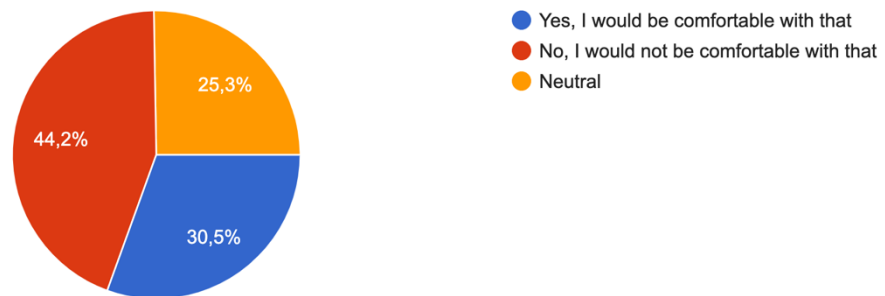
In your opinion, can AI endanger humanity in the future? (some examples of how AI could endanger humanity: Autonomous Weapons, Superintelligence, etc.)

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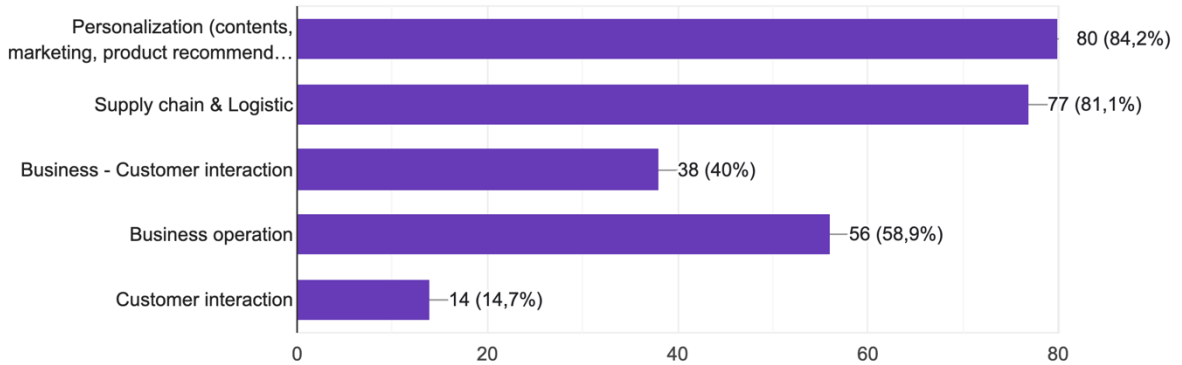
Would you be comfortable with AI making a decision that could significantly impact your life? (e.g: deciding whether you get job or loan)

95 câu trả lời



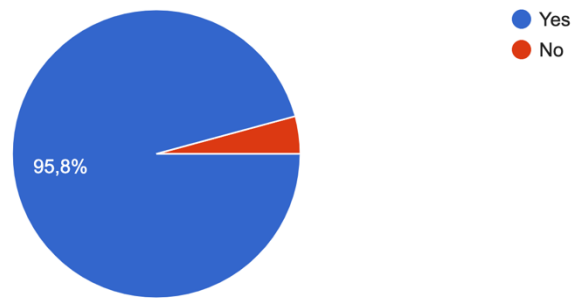
Some examples of E-commerce features that relate to AI application. (Choose all possible answers)

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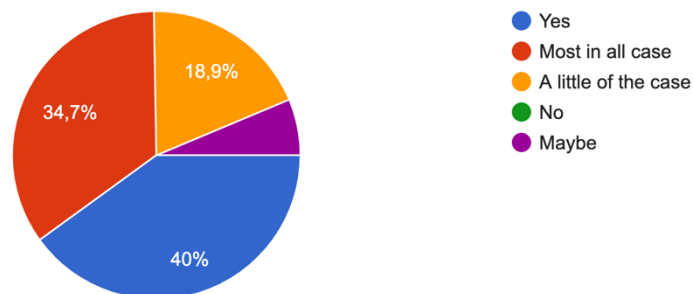
Do you think customer experience has a significant role in the success or failure of the business, especially in online business?

95 câu trả lời



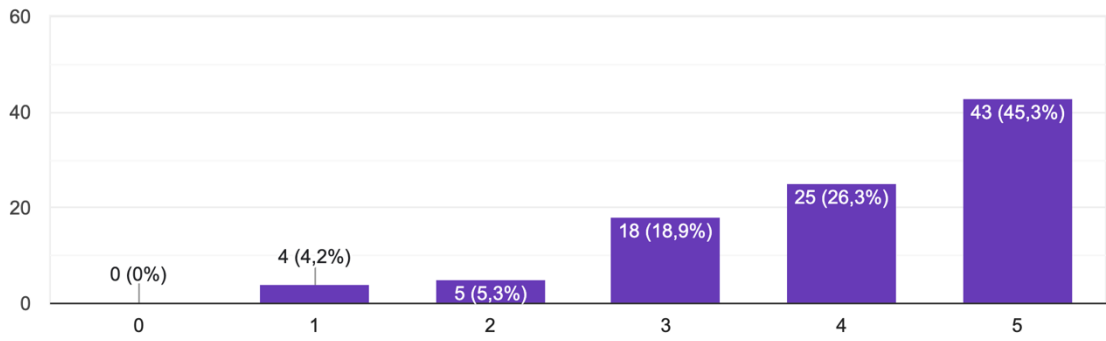
In your opinion, can AI applications in online shopping platforms (e-commerce) improve customer experience?

95 câu trả lời



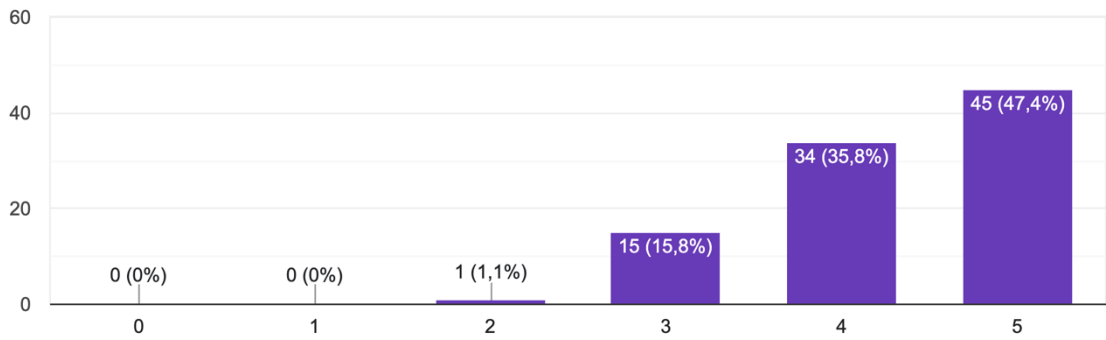
When I purchase online, the chatbot provides satisfactory assistance in answering my question.

95 câu trả lời



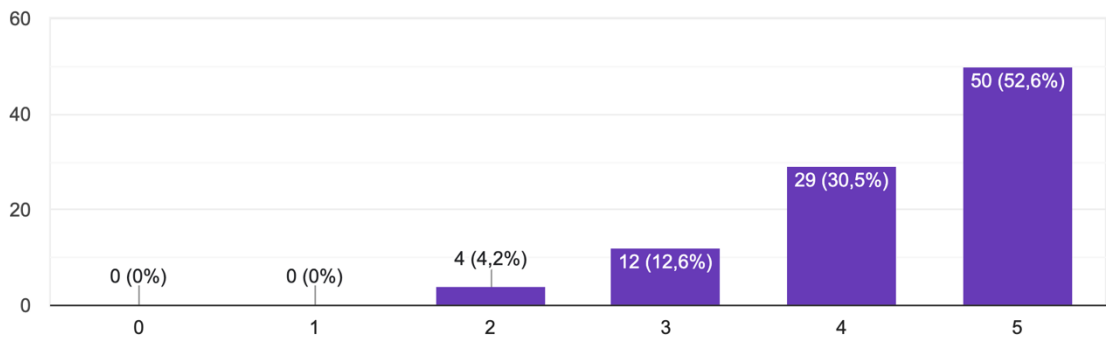
When shopping online, AI-powered product recommendation systems are accurate and helpful to my purchase.

95 câu trả lời



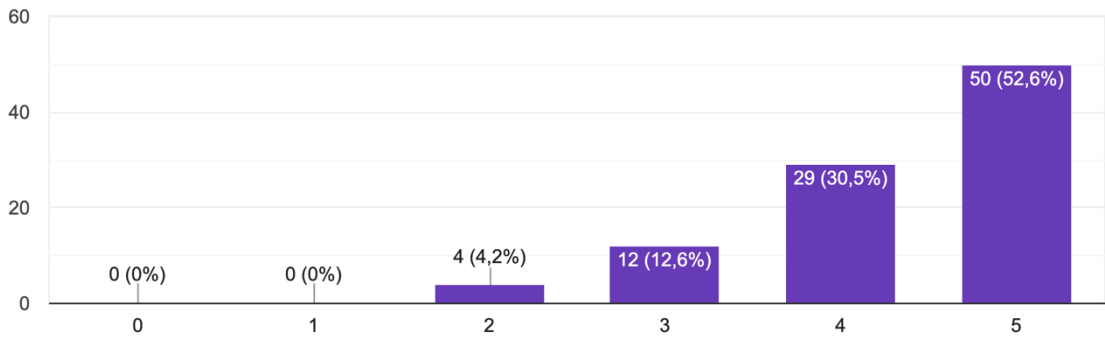
AI-powered customer service automation is very helpful and responsive for my purchase.

95 câu trả lời



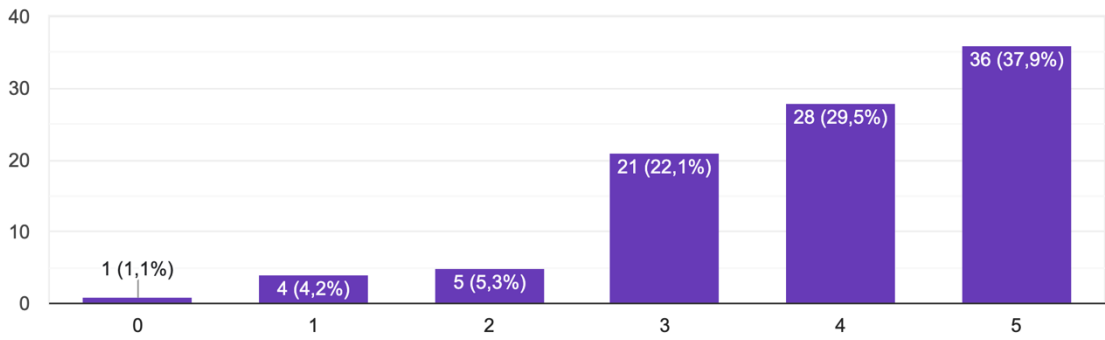
AI-powered customer service automation is very helpful and responsive for my purchase.

95 câu trả lời



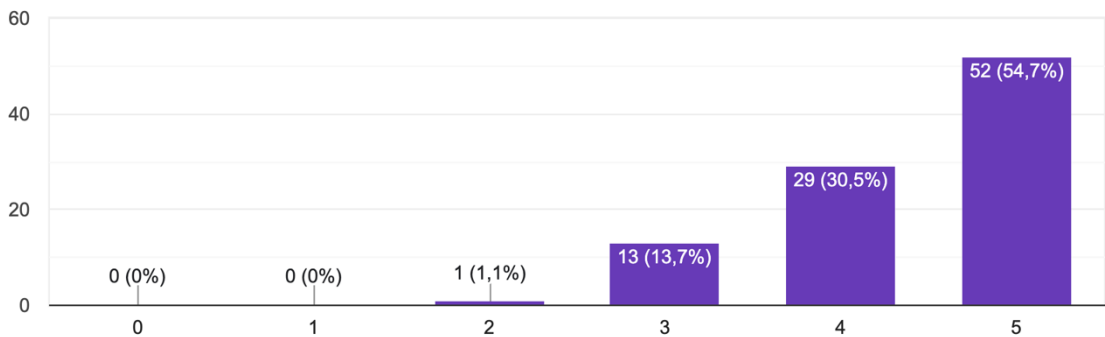
AI helps the supply chain optimization to ensure fast and reliable delivery.

95 câu trả lời



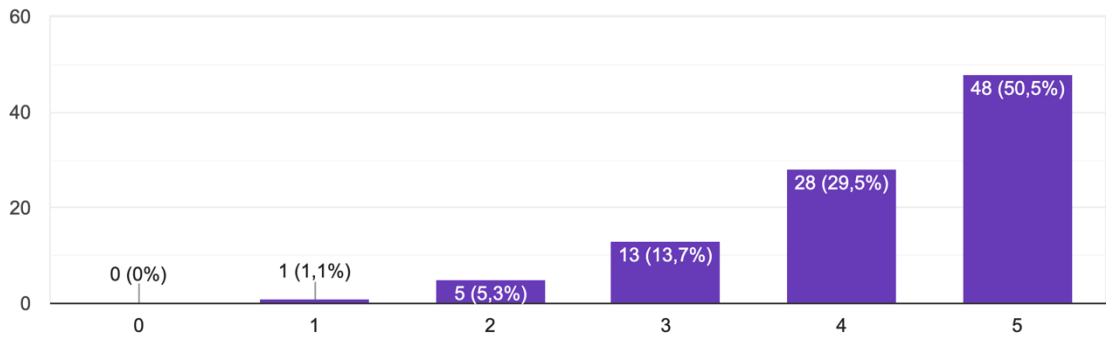
When shopping online, the AI-powered visual search (voice and image searching) helped me discover new products that I was interested in.

95 câu trả lời



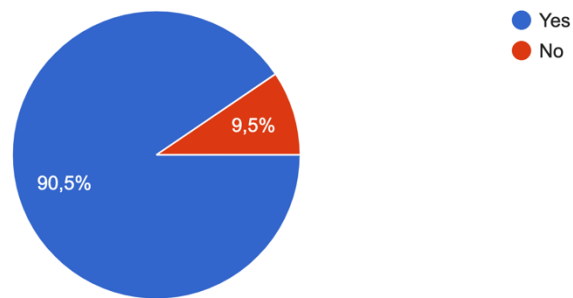
AI will have an influence on how online businesses and their customers interact.

95 câu trả lời



From your experiences with AI in online shopping, were you satisfied with the overall performance of the AI-powered features in the online shopping platform?

95 câu trả lời



Do you think it is worthy for companies to invest to AI applications in their online shopping platforms?

95 câu trả lời

