IMPACT OF ARTIFICIAL INTELLIGENCE ON E-MARKETING (A STUDY IN A SECTION OF COMPANIES IN THE CITY OF ISTANBUL)

2024
MASTER THESIS
BUSINESS ADMINISTRATION

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Prepared as

Master Thesis

KARABUK

January 2025

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THESIS APPROVAL PAGE

I certify in my opinion that the thesis presented by M. OSMAN JAMAL entitled "IMPACT OF ARTIFICIAL INTELLIGENCE ON E-MARKETING (A STUDY IN A SECTION OF COMPANIES IN THE CITY OF ISTANBUL)" is well suited in terms of scope and quality as a thesis for a Master of Science degree.

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DECLARATION

I thus affirm that this thesis is the product of my own research and all information presented has been acquired and elucidated in adherence to the academic guidelines and ethical principles stipulated by the institution. Furthermore, I hereby affirm that all assertions, findings, and materials that are not original to this thesis have been appropriately credited and referenced verbatim.

I acknowledge and assume full responsibility for any moral and legal repercussions that may arise from the detection of any actions that contradict the aforementioned statement, without imposing any temporal limitations.

Name Surname **:** M. OSMAN JAMAL

Signature :

FOREWORD

The first and most important thing I am grateful for is God who has blessed me with health and the ability to complete my education.

I have been bestowed with good health and the capacity to successfully pursue my educational endeavors.

I would like to extend my heartfelt gratitude to my supervisor, Prof. Dr. Sırma Oya TEKVAR, for his unwavering commitment and investment of time and effort in providing guidance and support to me. The acquisition of knowledge played a pivotal role in the successful culmination of my thesis. The present study is an outcome of the individual's bravery and assistance in the form of significant guidance and suggestions. Ultimately. I would want to extend my appreciation to my familial support system, particularly my paternal and maternal figures, as well as my siblings, for consistently providing me with unwavering support. Providing me throughout my most challenging occasions and aiding me in my academic pursuits. I would want to express my profound appreciation and gratitude to the benevolent nation of Turkey, its government, citizens, and leadership for their compassionate approach, as well as their affection. May divine protection shield them from any form of adversity. I would like to express my sincere appreciation and gratitude to the staff members of the Deanship of Scientific Research and Graduate Studies, as well as the Karabuk University library, for their invaluable assistance in procuring reference materials despite the various challenges encountered throughout my academic pursuits.

ABSTRACT

This study investigates the transformative impact of Artificial Intelligence (AI) on e-marketing, focusing on companies in Istanbul. It evaluates AI applications, including Natural Language Processing (NLP), expert systems, automated bots, and data security, to understand their influence on marketing strategies and customer engagement. The research identifies how these technologies optimize marketing processes, enhance personalization, and strengthen data protection. Using a quantitative research design, the study collects and analyzes data from the staff of companies in Istanbul. Findings demonstrate that NLP significantly improves customer interaction by enabling tailored communication through advanced sentiment analysis and automated systems. Expert systems enhance decision-making processes by analyzing customer behavior patterns, leading to more effective marketing strategies. Automated bots streamline operations, reduce response times, and facilitate 24/7 customer support, significantly boosting operational efficiency. Moreover, AI-driven data security technologies ensure robust protection for consumer information, enhancing trust and compliance with regulations. Despite these advancements, challenges such as ethical considerations, high implementation costs, and data privacy issues are highlighted. The study emphasizes the need for continuous research to address these barriers and optimize AI's potential. Practical implications suggest that businesses leveraging AI technologies can achieve greater customer satisfaction, operational efficiency, and competitive advantages. Furthermore, policymakers are encouraged to create regulatory frameworks that balance innovation with ethical and privacy concerns. This research contributes to theoretical knowledge by bridging gaps in AI's long-term implications on consumer behavior and trust in e-marketing. It also offers actionable insights for marketers and technology developers to integrate AI effectively. The findings highlight AI's dual role in transforming marketing strategies and reshaping business landscapes, providing a pathway for future exploration and innovation in digital marketing.

Keyword: Artificial Intelligence (AI), E-Marketing; Natural Language Processing (NLP); Expert Systems; Automated Bots; Data Security

ÖZET

Bu çalışma, Yapay Zeka'nın (YZ) e-pazarlama üzerindeki dönüştürücü etkisini inceleyerek İstanbul'daki şirketlere odaklanmaktadır. Doğal Dil İşleme (NLP), uzman sistemler, otomatik botlar ve veri güvenliği gibi YZ uygulamalarını değerlendirerek, bu teknolojilerin pazarlama stratejileri ve müşteri etkileşimleri üzerindeki etkilerini anlamayı amaçlamaktadır. Araştırma, bu teknolojilerin pazarlama süreçlerini nasıl optimize ettiğini, kişiselleştirmeyi nasıl geliştirdiğini ve veri korumasını nasıl güçlendirdiğini ortaya koymaktadır. Nicel bir araştırma tasarımı kullanılarak, İstanbul'daki şirket personelinden veri toplanmış ve analiz edilmiştir. Bulgular, NLP'nin ileri düzey duygu analizi ve otomasyon sistemleri aracılığıyla özelleştirilmiş iletişim sağlayarak müşteri etkileşimini önemli ölçüde iyileştirdiğini göstermektedir. Uzman sistemler, müşteri davranış modellerini analiz ederek karar verme süreçlerini geliştirmekte ve daha etkili pazarlama stratejilerinin oluşmasına katkı sağlamaktadır. Otomatik botlar, operasyonları kolaylaştırmakta, yanıt sürelerini azaltmakta ve 7/24 müşteri desteği sunarak operasyonel verimliliği artırmaktadır. Ayrıca, YZ destekli veri güvenliği teknolojileri, tüketici bilgilerini güçlü bir şekilde koruyarak güveni artırmakta ve düzenlemelere uyumu sağlamaktadır. Bu ilerlemelere rağmen, etik konular, yüksek uygulama maliyetleri ve veri gizliliği sorunları gibi zorluklar vurgulanmaktadır. Çalışma, bu engelleri ele almak ve YZ'nin potansiyelini en üst düzeye çıkarmak için sürekli araştırma yapılmasının önemini vurgulamaktadır. Uygulamalı sonuçlar, YZ teknolojilerinden yararlanan işletmelerin daha yüksek müşteri memnuniyeti, operasyonel verimlilik ve rekabet avantajı elde edebileceğini göstermektedir. Ayrıca, politika yapıcılara, yenilikçiliği etik ve gizlilik endişeleriyle dengeleyen düzenleyici çerçeveler oluşturulması önerilmektedir. Bu araştırma, YZ'nin tüketici davranışı ve e-pazarlamadaki güven üzerindeki uzun vadeli etkilerine ilişkin boşlukları doldurarak teorik bilgiye katkıda bulunmaktadır. Aynı zamanda, pazarlamacılar ve teknoloji geliştiriciler için YZ'yi etkili bir şekilde entegre etmeye yönelik uygulanabilir içgörüler sunmaktadır. Bulgular, YZ'nin pazarlama stratejilerini dönüştürmedeki ve iş dünyasını yeniden şekillendirmedeki çift rolünü vurgulayarak dijital pazarlamada gelecekteki keşifler ve yenilikler için bir yol sunmaktadır.

Anahtar Kelimeler: Yapay Zeka (YZ); E-Pazarlama; Doğal Dil İşleme (NLP); Uzman Sistemler; Otomatik Botlar; Veri Güvenliği

ARCHIVE RECORD INFORMATION

Title of the Thesis	Impact of Artıfıcıal Intellıgence on E-Marketıng (A Study In A Sectıon of Companıes in the Cıty of Istanbul)
Author of the Thesis	M, OSMAN JAMAL
Advisor of the Thesis	Prof. Dr. Sırma Oya TEKVAR
Status of the Thesis	Master's Degree
Date of the Thesis	17.01.2025
Field of the Thesis	Business Departmen
Place of the Thesis	UNIKA/IGP
Total Page Number	73
Keywords	Artificial Intelligence (AI), E-Marketing, Natural Language Processing (NLP), Expert Systems, Automated Bots, Data Security

ARŞİV KAYIT BİLGİLERİ

Tezin Adı	Yapay Zekanın E-Pazarlama Üzerindeki Etkisi (İstanbul Şehrindeki Bazı Şirketler Üzerine Bir Çalışma)
Tezin Yazarı	M. OSMAN JAMAL
Tezin Danışmanı	Prof. Dr. Sırma Oya TEKVAR
Tezin Derecesi	Yüksek Lisans Tezi
Tezin Tarihi	17.01.2025
Tezin Alanı	İşletme Anabilim Dalı
Tezin Yeri	KBU/LEE
Tezin Sayfa Sayısı	73
Anahtar Kelimeler	Yapay Zeka (YZ), E-Pazarlama, Doğal Dil İşleme (NLP), Uzman Sistemler, Otomatik Botlar, Veri Güvenliği.

SUBJECT OF THE RESEARCH

The research examines the transformative influence of Artificial Intelligence (AI) on e-marketing, specifically in companies located in Istanbul. By exploring AI technologies such as Natural Language Processing (NLP), expert systems, automated bots, and data security applications, the study evaluates their impact on marketing strategies and consumer engagement. This research is particularly relevant in understanding how these advanced technologies optimize processes, enable personalization, and enhance operational efficiency, thereby reshaping traditional marketing approaches in a rapidly evolving digital landscape.

PURPOSE AND IMPORTANCE OF THE RESEARCH

This study aims to uncover the potential and challenges of AI integration in e-marketing. It seeks to understand how AI tools enhance customer interaction, optimize marketing campaigns, and ensure data security while addressing concerns such as ethical implications and high implementation costs. The findings provide actionable insights for marketers, technology developers, and policymakers, offering a theoretical and practical framework to advance AI-driven marketing strategies. Its importance lies in guiding businesses to adapt and innovate in the competitive digital economy.

METHOD OF THE RESEARCH

A quantitative research approach was adopted to analyze the integration of AI in e-marketing. Data was collected from worker in Istanbul-based companies through structured surveys. Statistical techniques, including reliability analysis, correlation analysis, and hypothesis testing, were applied to evaluate the relationship between AI applications and key marketing performance indicators. This systematic approach ensures the validity and reliability of findings, offering empirical evidence on AI's role in enhancing e-marketing practices.

RESEARCH PROBLEM

Integrating artificial intelligence (AI) into marketing strategies specifically e-marketing has garnered significant attention as a potential game-changer in enhancing competitive advantages for businesses globally (Teixeira & Remondes, 2023). However, the rapid evolution of AI technologies poses intricate challenges and raises critical questions about the efficacy, adaptability, and strategic implications of AI applications in the e-marketing domain.

The relentless pace at which AI technologies evolve and permeate various aspects of e-marketing from consumer data analysis and personalized marketing to automated customer interactions demands a robust understanding of b the potential benefits and the complex challenges they present (Shaik, 2023). As AI tools become more sophisticated, they offer unprecedented capabilities to tailor marketing efforts based on real-time consumer data, predict purchasing behaviors, and automate customer engagement through intelligent chatbots and personalized content delivery (Sadeq et al., 2023). These capabilities suggest a potential for enhanced efficiency and customer satisfaction and still need to be explored. This critically examines significant gains in market share and profitability.

Despite these promising advantages, several critical challenges still need to be explored. First, there is the issue of data privacy and security central concerns in consumer markets that are increasingly sensitive to how their information is used and shared. The deployment of AI in e-marketing requires handling vast analytical data and raising significant ethical and legal questions. How businesses address these concerns will critically impact consumer trust and, consequently, the effectiveness of AI-driven e-marketing strategies.

Secondly, the digital divide presents another significant challenge. The varying levels of access to cutting-edge AI technologies among companies create a disparity in marketing success, potentially leading to market monopolies or marginalization of smaller players who need marginalization analyses help to afford such advanced technologies. This technological divide could exacerbate existing inequalities within and across markets, questioning the fairness and inclusivity of AI-driven e-marketing advancements.

Integrating AI in e-marketing also requires substantial investment in technology and training (Ward, Marmol, Lopez-Lopez, Carracedo & Juan, 2023). For many businesses, especially small to medium-sized enterprises, the costs of implementing sophisticated AI systems may be prohibitive (Bhalerao, Kumar, Kumar & Pujari, 2022). These firms may need help with the up-front investments required for AI technologies, including the systems themselves, and analyzing the necessary infrastructure and expertise to operate and analyses them effectively. This challenge is compounded by the rapid pace of technological change, which can render expensive systems obsolete within a few short years, thus raising concerns about long-term viability and return on investment.

While AI can analyze and predict consumer behavior homogenization and personalized analysis of the necessary infrastructure and expertise to operate and analyses with increasing accuracy, there is a risk that over-reliance on automated systems could lead to a homogenization of marketing strategies (Mariani, Perez-Vega & Wirtz, 2022). The nuanced understanding of cultural, contextual, and individual factors that traditionally influence marketing decisions might be overlooked or misunderstood by AI systems, potentially leading to less effective marketing over time.

Given these complexities, this study aims to provide a comprehensive analysis of the impact of AI on e-marketing, exploring not only the transformative potentials but also the significant challenges that need addressing. This critically examines AI's role in shaping contemporary e-marketing strategies and the broader implications for competitive dynamics in various industries. The study will contribute valuable insights into the strategic integration of AI in e-marketing, offering a balanced perspective on its benefits and potential pitfalls.

SCOPE AND LIMITATIONS / DIFFICULTIES ENCOUNTERED

This study focuses on analyzing the influence of artificial intelligence (AI) on e-marketing. It involves a thorough investigation of the incorporation of AI technology into different marketing techniques and the resulting effects of these integrations. The study primarily aims to comprehend the implementation of artificial intelligence in many aspects of electronic marketing, such as consumer data analytics, personalized content delivery, automated customer care interactions, and optimization of digital advertising

campaigns. The study seeks to clarify the practical improvements that AI brings to the marketing field, including enhanced efficiency, better client targeting, and the possibility of achieving higher conversion rates. In addition, the research aims to evaluate the wider consequences of artificial intelligence (AI) on market dynamics, namely its impact on competitive tactics, influence on consumer habits, and changes to the traditional marketing environment.

INTRODUCTION

In modern business, the influence of artificial intelligence (AI) is both pervasive and transformative, reshaping industries with unprecedented speed and scope. Among the various sectors experiencing this wave of change, e-marketing stands out as a primary beneficiary of AI's capabilities (Sadeq, Nassreddine, & Younis, 2023). Significant advancements in data analysis, machine learning, and algorithmic innovations have marked the evolution of AI in recent years (Lu, 2019). These developments have equipped marketers with tools that not only predict consumer behavior with high accuracy but also automate complex decision-making processes that were traditionally the purview of human experts (Gupta, 2021). The integration of AI into e-marketing processes has been about technological upgrades and a fundamental shift in how marketing campaigns are designed, executed, and managed (Chintalapati & Pandey, 2022).

The impact of artificial intelligence (AI) on e-marketing is a significant area of study and research in the field of digital marketing (Nguyen & Malik, 2022: Durmaz, 2023: Shaik, 2023). AI has the potential to revolutionize the way businesses engage with their customers, personalize marketing campaigns, and optimize their digital strategies (Jha, Yogeshwari, Rubini & Singh, 2023: Rubab, 2023). In the context of e-marketing, AI technologies such as machine learning, natural language processing, and predictive analytics can provide valuable insights and automation capabilities that can enhance the efficiency and effectiveness of marketing efforts.

One of the key areas where AI is making a significant impact on e-marketing is the area of customer segmentation and targeting (Alves Gomes & Meisen, 2023: Talaat, Aljadani, Alharthi, Farsi, Badawy & Elhosseini, 2023: Sheth, 2023). AI algorithms can analyze vast amounts of data to identify patterns and trends in customer behavior,

preferences, and demographics. This allows marketers to create more personalized and targeted marketing campaigns that are tailored to the specific needs and interests of individual customers (Sehar, Kanwal, Dashtipur, Abbasi & Khan, 2021: Malik, Hassouna & Togher, 2023).

AI-powered chatbots are another example of how artificial intelligence is transforming e-marketing. Chatbots can provide real-time customer support, answer queries, and guide customers through the purchasing process. By leveraging natural language processing and machine learning, chatbots can simulate human-like interactions and provide personalized recommendations based on customer preferences (Talukder, Kabir, Muhsina, & Das, 2023: Aggarwal, Sharma, Saxena, 2024).

Furthermore, AI can also help marketers optimize their digital advertising campaigns. By analyzing customer behavior and preferences data, AI algorithms can identify the most effective channels, messaging, and timing for delivering ads to target audiences. This can help businesses maximize their return on investment and improve the overall performance of their e-marketing campaigns (Shameem et al., 2023: Shiju, 2023).

The impact of artificial intelligence on e-marketing is profound and multifaceted. By leveraging AI technologies, businesses can gain valuable insights, automate repetitive tasks, and personalize marketing efforts to engage customers more effectively. As AI evolves and advances, its role in e-marketing will become even more critical in driving business growth and success in the digital age. In summary, the exploration of artificial intelligence's impact on e-marketing presented in this study will provide valuable insights into how AI technologies are not just changing marketing tools but are reshaping the fabric of business strategies in the digital age. The findings aim to contribute to the academic discourse on AI and offer actionable guidance for practitioners in the field of e-marketing, thereby bridging the gap between theoretical research and practical application.

1. CONCEPTUAL FRAMEWORK

1.1. Artificial Intelligence (AI)

Ferm and Thaichon (2021) and Nguyen et al. (2021) have referred to the 21st century as the era of digital technologies, whereas Hasan et al. (2021a) and McCorduck and Cfe (2004) have referred to it as the age of artificial intelligence (AI). Since it includes the boundaries of growing computing capacity, managing artificial intelligence is different from managing information technology (IT) in the past (Berente et al., 2021). According to Balakrishnan and Das 2020 and Hasan et al. 2021b, a significant number of companies have been incorporating artificial intelligence (AI) technology into their business transformation strategies. These technologies include robots and autonomous vehicles, face recognition, natural language processing, and virtual agents of various kinds. Once artificial intelligence enables companies to build intelligent goods, conceive unique service offerings, and innovate new business models, it is anticipated that the applications of AI will continue to rise at an incredible rate. This prediction is based on research conducted by Davenport et al. in 2020 and Nguyen et al. in 2022. There are new issues that are being faced in the process of implementing artificial intelligence. These challenges include managing human-AI interfaces, data, privacy, security, ethics, and privacy (Kellogg et al., 2020; Quach et al., 2022; Russell, 2019).

Managers need to have a complete understanding of artificial intelligence, including its fundamentals, evolution, potential solutions, and potential, in order to cope with the opportunities and difficulties that are presented by AI-based systems in the corporate world. The responsibility of designing and executing AI-based systems, as well as the repercussions of AI in a variety of situations, lies on the shoulders of managers (Martin, 2019). The purpose of this chapter is to provide managers with a fundamental introduction to artificial intelligence (AI) so that they may engage in self-reflection and strategically plan for the AI efforts of their firm. The purpose of this chapter is to present an overview of the development of artificial intelligence (AI), including what AI is and what it is not, as well as many ways to comprehending the boundaries of the world of AI.

In light of the fact that the concept of artificial intelligence has been understood in a great number of different ways, both within and outside of the field, and that it has caused a great deal of confusion that has made it difficult for different groups of

researchers to work together (Lewis & Monett, 2018), it is necessary to conduct a review of the various definitions in order to have a comprehensive understanding of what constitutes AI and what does not constitute AI. As a result, the primary methods from (1) the technological viewpoint, (2) the psychology perspective, and (3) the cognition (thinking) version conduct (acting) perspective are described here before the scope of artificial intelligence is expounded upon.

It is common for early researchers in the field of artificial intelligence to characterize AI as a technical innovation that can handle problems involving mathematical and logical thinking. They defend the word artificial intelligence by defining it as "the science and engineering of making intelligent machines, especially intelligent computer programs." McCar thy is the person who first used the phrase. "It is related to the similar task of using computers to understand human intelligence, but artificial intelligence does not have to confine itself to methods that are biologically observable" (McCarthy, 2004). According to this point of view, intelligence is defined as the capacity of humans to detect and process information in an efficient manner, as well as to convert this information into knowledge, which can then be utilized for action that is driven by certain goals. Following McCarthy (2004)'s approach, Sutton (2020) suggested a definition that was more complicated: "Intelligence is the computational component of the ability to accomplish goals." Any system that is more meaningfully understood in terms of results than in terms of mechanisms is considered to be one that is capable of attaining its goals. For the sake of this discussion, intelligence refers to the capacity to find solutions to difficult issues, and artificial intelligence (AI) is defined as the field of research that focuses on teaching machines to do tasks that people regard to need intellect (Minsky, 1985).

According to Wang (2019), researchers believe that artificial intelligence systems should be able to process tasks with sufficient flexibility. They believe that these systems should not rely solely on predetermined algorithms and structures. This is due to the fact that there is always knowledge that is either missing or uncertain, and the system does not have the time to investigate every possibility that comes its way. When it comes to accomplishing straightforward activities that do not need intellect, the knowledge and resources that are available through an information processing system are comparatively sufficient. Consequently, the usual working settings of an artificial intelligence system are where the actual tangible challenges exist, and operating with insufficient knowledge

and resources relates to those situations. As a result, an intelligent system has to be able to adjust to different contexts and have the ability to deal with inadequate knowledge and resources (Thorisson, 2020).

AI might be defined as "computational agents that act intelligently" (Poole & Mackworth, 2010), according to experts, despite the fact that numerous techniques have been used. Utilizing computer programs (also known as algorithms) that enable us to solve issues and learn on our own in order to transform data into knowledge that is meaningful and actionable, artificial intelligence (AI) seeks to achieve human-level or ideal intelligence. Accordingly, we decided to use the definition of artificial intelligence that was offered by Berente et al. (2021) as the foundation for future exploration of AI. This definition describes AI as "the frontier of computational advancements that references human intelligence in addressing ever more complex decision-making problems."

The use of this term can be justified by three different arguments. Initially, this definition highlights the fact that artificial intelligence is not a collection of fixed technologies but rather a dynamic phenomena that represents a moving frontier of the next generation of developments in computing. The majority of early computer programs were not deemed artificial intelligence (AI) at the time, although they were at the time. Second, this concept emphasizes the critical role that decision-making plays in artificial intelligence. Artificial intelligence (AI) is the act of informing or automating the decision-making process of humans via the use of intelligent computer programs (Russell, 2019). The third point is that this definition makes a direct reference to the connection that exists between AI and human behavior. Both the concept of replicating human intelligence (thinking and behaving in a human manner) and the concept of exceeding thinking (thin acting and acting logically) ought to continue to be at the core of artificial intelligence research (Berente et al at 2021).

1.1.1. Natural Language Processing

Natural Language Processing (NLP) is a vital and ever-evolving discipline in the realm of artificial intelligence that seeks to connect the divide between human communication and computer comprehension. Natural Language Processing (NLP) focuses on creating methods and systems that enable computers to effectively handle,

analyze, and synthesize human language. This entails a variety of duties, including language translation, speech recognition, and responding to textual and vocal instructions. Natural Language Processing (NLP) integrates computational linguistics, which involves creating models of human language based on rules, with statistical, machine learning, and deep learning models. These technologies facilitate the processing of human language by computers, whether in the form of text or speech data, allowing them to comprehend its entire meaning, including the speaker or writer's intention and sentiment (Sousa, 2022).

The potential applications of NLP are extensive and expanding, influencing several industries, including customer service, healthcare, and education. For example, natural language processing (NLP) enables virtual assistants to effectively handle and respond accurately to requests like humans. The healthcare industry utilizes Natural Language Processing (NLP) techniques to analyze and classify clinical data, streamlining the process of extracting vital patient information from material lacking a predefined framework (Chowdhary & Chowdhary, 2020). Furthermore, within the field of education, NLP tools facilitate learning and evaluation systems by allowing them to analyze and understand students' natural language responses. With the ongoing advancement of NLP, there is a growing potential for more advanced human-computer interaction, creating new opportunities for automation and increased productivity in several industries (Pham et al., 2020).

Computer scientists refer to human languages like English, Portuguese, or Mandarin as "natural" languages. This term is used to differentiate them from languages specifically created for machines, whose rules were established before people began using the language. In human language, the situation is the opposite. Evolutionary processes shaped natural language. Similar to English grammar, speakers established the "rules" of the language retrospectively, often disregarding or violating them. Simultaneously, computers convert information into a machine-readable language that is highly organized and strict, employing precise syntactic rules to connect precisely defined concepts from a predetermined vocabulary. Natural Language Processing (NLP) involves leveraging machine learning algorithms and extensive datasets to enable computers to process a given piece of language as input and provide valuable output (Chollet, 2021).

The overall machine learning workflow include the following steps:

Compiling and obtaining the necessary data for your assignment: Business researchers have utilized text data from various sources, including online surfing, discussions, corporate communications, video and audio files, and social media chatter, to carry out natural language processing (NLP) activities (Shankar & Parsana, 2022).

Cleaning and inspecting data to improve comprehension: One can employ various pre-processing techniques, some of the most prevalent ones being the elimination of undesirable words, numbers, punctuation, and/or symbols (Shankar & Parsana, 2022).

Conduct feature engineering to enable the algorithm to utilize the data in a suitable format, such as transforming the data into numerical vectors. Before running an NLP model, one must transform the data, typically provided as human-readable text, into a structured input suitable for algorithm analysis (Khurana, Koli, Khatter & Singh, 2023).

Partition the data into training and testing sets and evaluate several models: People commonly use statistical natural language processing (NLP) models to categorize text based on statistical word distributions. A topic model, which is widely used, groups keywords together based on an underlying thematic resemblance or theme. Neural NLP models utilize deep learning. The human brain serves as the model for deep learning. Various levels of machine learning generate artificial neurons that mimic the structure of the human brain. The network learns at each level and transfers its generated results to the next network. Using that data, the next network performs a different task (Galassi, Lippi & Torroni, 2020).

Assessing the model: Various NLP models employ distinct techniques for categorization and prediction. It is possible to assess and analyze NLP models using several metrics. Since the majority of models depend on classification tasks, it is suitable to employ metrics such as accuracy, precision, recall, and error rate (Shankar & Parsana, 2022).

Once in use, algorithms typically undergo automation, but their development, installation, and training still necessitate a high level of technical expertise, extensive study, and a focus on human involvement. Humans are crucial in strategically refining

AI systems to achieve optimum operations. AI is not a technology that can be implemented and left alone. It requires ongoing manual adjustments, particularly when dealing with natural language processing (Mari, 2019).

1.1.2. Expert System

An expert system is an artificial intelligence piece of software that employs a predetermined set of rules or a knowledge base to replicate the decision-making capacity of a human expert in a particular domain. Expert systems specifically employ logical reasoning based on extensive knowledge bases, primarily represented by if-then rules instead of traditional procedural code, to address intricate problems. An expert system consists of three main components: the knowledge base, which stores the relevant domain knowledge; the inference engine, which uses logical rules to derive new information and solve problems based on the knowledge base; and the user interface, which enables non-experts to interact with the system for advice or decision-making (Różewski et al., 2019).

Diverse fields like medical, engineering, finance, and customer service employ expert systems. They offer advice, diagnose problems, and provide solutions based on the input data they receive. Expert systems in medicine can help diagnose diseases by analyzing symptoms, laboratory findings, and patient information. In the field of finance, these tools can assess a person's loan eligibility by scrutinizing their personal data or offer advice on efficient investment strategies. The attractiveness of expert systems arises from their capacity to provide consistent and logical conclusions in specific domains of knowledge, hence assisting decision-making processes and improving efficiency in jobs that usually demand significant human skill (Mohammed, Ambak, Mosa & Syamsunur, 2019).

Knowledge-Based Expert Systems (KB-ES) use knowledge and deduction techniques to address complex problems that require the expertise of human professionals to resolve. The AI community developed KBS, or knowledge-based systems, as a subfield of artificial intelligence in the 1960s (Liao, 2005). KBS's fundamental premise is accumulating specialized knowledge and skills relevant to a specific job. Expert systems (ES) are highly effective tools for managing and preserving essential knowledge and enhancing manufacturing competitiveness. Organizations also

utilize them for training and knowledge sharing. ES facilitates the efficient transfer of knowledge at a low cost. In 1960, AI received an imperative command to revise and make general-purpose issue solvers more effective when solving intricate problems. ES's effectiveness stems from understanding information rather than a specific deduction. This emerging perspective on AI systems demonstrates the advancement of highly capable problem-solving agents (Patterson, 2011).

KBS encodes specialized knowledge into factual information, rules, heuristics, and processes. ES consists of three components: a database, a knowledge base, and an inference engine. Figure 1 illustrates the overall structure of KB-ES. The database encompasses factual and heuristic data pertaining to the user's chosen problem domain. Mathematical logic represents domain-specific knowledge in the knowledge base. Therefore, we categorize it as a rule-based system (RBS), frame-based system (FBS), object-oriented system (OOS), and case-based reasoning (CBR) system. An 'if-then' else condition drives the operation of a rule-based system (RBS), which executes a specific task when the condition is satisfied. The term 'frame' is used by FBS to represent a subject or a situation. OOS is a method of organizing information that involves a hierarchical structure of classes, subclasses, and object behavior (Lin & Sheu, 2012).

The inference engine functions as a regulatory environment and interacts with the user. The system accepts user feedback regarding the issue and can gather further information as needed. In order to generate logical deductions and offer expert guidance, the system understands the information base. Over the past few decades, researchers have conducted several studies focusing on various aspects of environmental sustainability. There are two main areas that this study focuses on: (1) knowledge acquisition and validation; and (2) knowledge acquisition for process planning.

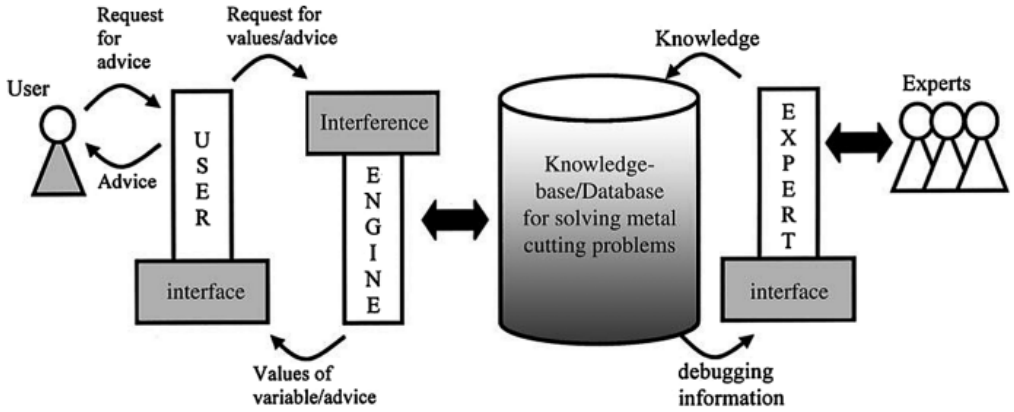

Figure 1: Knowledge-based expert system (Cakir & Cavdar 2006).

1.1.3. Automated Bots

Automated bots, often known as bots, are software applications designed to independently carry out repetitive operations (Assenmacher et al., 2020). We derive the term "bot" from "robot" to describe automated systems that often operate independently. Diverse industries extensively employ bots to perform a wide range of tasks, from basic automation to intricate decision-making procedures that often require human involvement (Mondada et al., 2004). Bots function according to a predetermined set of algorithms that dictate their actions. Artificial intelligence (AI) approaches can design them to adhere to precisely specified rules or to make judgments. Bots exhibit varying levels of sophistication, from basic scripts handling routine data entry chores to powerful AI-powered systems capable of engaging in human-like conversations or making independent judgments based on extensive study of large datasets (Haustein et al., 2016).

Chatbots are a prevalent form of bot that imitates interaction with human users, usually through text or voice interfaces. Customer support uses these to manage questions without human involvement, delivering responses derived from a pre-established database or, more advanced, through natural language processing (NLP) (Liang & Straub, 2021). Platforms such as company websites, social media, and messaging applications commonly host chatbots. They offer round-the-clock assistance at a significantly lower expense compared to employing human personnel.

Another notable utilization of bots is in web crawling, where bots, commonly referred to as spiders or crawlers, methodically navigate the World Wide Web to catalog material for search engines. By utilizing this capability, search engines such as Google, Bing, and other similar platforms can gather and categorize large quantities of information, allowing users to easily find what they are looking for. These bots are crucial for ensuring the accuracy and currency of information in search engine databases (Suhaili, Salim, & Jambli, 2021). Trading bots in the financial sector automate stock transactions by utilizing specified criteria or algorithms that monitor market data in order to exploit trading opportunities. Automated bots have the capability to carry out deals at velocities and quantities that would be unattainable for human traders, resulting in notable benefits in rapidly moving markets (Ng et al., 2020).

Social media users use automated bots for routine tasks like scheduling content postings, but they also have the potential to manipulate public opinions by amplifying certain viewpoints or disseminating false information. The use of bots for both purposes raise ethical and regulatory concerns about their role in influencing public discourse (Orabi, Al Aghbari, & Kamel, 2020). Technically, the process of creating a bot involves using programming languages such as Python, which provides libraries specifically designed for bot development. Microsoft Bot Framework, Dialogflow, and similar tools and platforms offer developers an efficient environment to create and launch bots (Murthy et al., 2016).

Although bots offer advantages, they also pose obstacles, namely in terms of security and ethics. Inadequately protected bots are susceptible to being commandeered or manipulated to illicitly obtain unauthorized access to data. Morally, the use of bots to automate jobs raises concerns about the effects on employment and the future trajectory of work.

Automated bots are a notable technical advancement that brings forth increased efficiency and novel capabilities in diverse fields. As bots become more ingrained in our daily activities, the manner in which we handle and engage with them will progressively become a vital component of digital ethics and security protocols. The ongoing progress of their advancement holds the potential for increasingly more refined uses, but it also necessitates a thoughtful examination of their wider societal consequences (Syed et al., 2020).

1.1.4. Data Security

Data security combines physical and digital techniques to protect data from unauthorized access and cyber threats (Attkan, & Ranga, 2022). These encompass technical measures like encryption, firewalls, anti-virus software, and intrusion detection systems, which ensure data security when stored, transmitted, and actively used. Encryption is crucial because it guarantees that intercepted data remains unreadable without the encryption key. Firewalls function as impediments to prevent illegal entry into networks, while anti-virus software aids in identifying and eliminating harmful software threats (Gunduz, & Das, 2020).

Organizations must additionally implement rules and procedures that establish how data should be managed and safeguarded. These measures encompass enforcing robust password restrictions, frequent software updates, and stringent access controls that limit data access only to authorized workers. Regular security audits and adhering to regulations like the General Data Protection Regulation (GDPR) in Europe and the Health Insurance Portability and Accountability Act (HIPAA) in the United States are essential for preserving data integrity and ensuring security (Yang, Xiong & Ren, 2020).

Data security and privacy are crucial for protecting personal and corporate information in the digital environment. Data security entails the use of strong technical and operational safeguards to protect data from illegal access, modification, or destruction. This is achieved using techniques such as encryption, firewalls, and access restrictions. Contrarily, data privacy revolves around ethical management, explicit consent, and entitlements associated with personal data, ensuring its utilization aligns with established legislative frameworks like GDPR or HIPAA. These concepts collectively tackle the challenges of handling confidential information in a society that is becoming more linked. They aim to strike a balance between ensuring security and upholding individuals' rights to privacy (Yang, Xiong, & Ren, 2020).

In the digital era, the protection of data and privacy is of utmost importance due to the growing trend of storing sensitive information on electronic platforms and transmitting it over the internet (Nissenbaum, 2020). Data security is the implementation of protective measures and policies to protect data against unauthorized access, corruption, or theft. Privacy pertains to the methods of collecting, storing, managing,

and sharing data, with a specific emphasis on upholding individuals' rights to govern their personal information (Tyagi, Nair, Niladhuri, & Abraham, 2020).

Data security primarily concerns the implementation of technical and operational measures to safeguard data, whereas data privacy pertains to the rights of individuals to exercise control over their personal information. This encompasses the legal aspects of data collection, processing, sharing, and destruction. Privacy regulations differ among nations, but their primary objective is to grant individuals authority over their personal information while placing limitations on others who manage the data (Solove & Schwartz, 2020).

As an illustration, the General Data Protection Regulation (GDPR) grants European Union (EU) residents' certain entitlements to their data, such as the entitlement to access, rectify, erase, and limit the processing of their data (Hoofnagle, Van Der Sloot, & Borgesius, 2019). Companies are required to guarantee transparency regarding their procedures of collecting and utilizing data, and they must seek explicit consent from individuals before processing their data. The issue of privacy becomes especially critical when dealing with emerging technologies like the Internet of Things (IoT) and artificial intelligence (AI). These technologies have the capability to gather and analyze massive quantities of data, frequently without obtaining explicit authorization or informing the user (Wu, Han, Wang, & Sun, 2020).

1.2. E-Marketing in the Digital Era

1.2.1. Benefits and Challenges of E-Marketing

E-marketing is the practice of advertising and selling items or services through digital technologies such as the Internet, mobile devices, and social media platforms. At present, there is still no broadly agreed-upon definition (Lao, 2005). As per the current definitions, e-marketing encompasses working together with other departments such as procurement, production, finance, human resources, quality control, and product development. The goal is to revamp and create new business benchmarks for firms that use computer networks to meet digital management and commercial needs.

E-marketing is the deliberate utilization of contemporary communication methods by agencies or companies to transform potential customers into real markets. It

plays a vital role in a comprehensive marketing strategy and functions as a marketing tool to accomplish marketing goals by utilizing the internet (Feng, 2005). E-marketing is the use of the internet to provide a comprehensive range of services throughout the entire process of promoting, selling, and supporting a product. It covers all aspects of the business, including attracting new customers and providing services to existing clients. The technique is based on modern marketing theory and uses internet technology and its features to meet client needs. Its goal is to stimulate new marketing strategies and increase operational profit (Yang, 2006).

E-marketing is a recently introduced technology that has gained significant recognition across several industries, including manufacturing and services (Abo Bakar & Ahmed, 2015). Barwise and Farley (2005) conducted investigations that elucidate the maturation of e-marketing technologies. Day and Bens (2005) demonstrate that major companies use e-marketing to enhance their competitive edge through marketing strategies. However, Chen and Lien (2013) emphasize that businesses are adopting them at a relatively slower rate, despite the tremendous advancements in new technology. In line with this assertion, El Gohary (2012) elucidates that e-marketing technology remains a very nascent concept, particularly for organizations operating in underdeveloped nations. Typically, these companies already face resource constraints and intense rivalry.

E-businesses are defined as the use of digital and information technologies to oversee organizational activities and execute conventional marketing methods. E-marketing comprises several technologies that allow customer relationship management, resource organization, supply chain management, text message communication, and other related functions (Nadube & Ordah, 2023). Therefore, in order to optimize revenue from an e-commerce platform, it is imperative to implement a comprehensive marketing strategy that includes key components such as a distinctive branding approach, strategically chosen keywords used by customers for product searches, and efficient advertising on internet search engines to enhance visibility among potential customers (Kumar, 2022). The main objective of shopping is to discern the requirements and aspirations of the target market and to attain the requisite contentment in a more proficient and streamlined manner than competitors. Furthermore, when considering electronic marketing, we are specifically referring to the amalgamation of the Internet

and diverse technologies that enable interactions between people (Obeidat, 2021; Irtaimeh et al., 2016).

Moreover, the global increase in internet users has led to an expansion of its uses, namely in the field of commercial marketing (Obeidat, 2021). The widespread adoption of technology, along with breakthroughs in computer science, has led to substantial changes in the corporate landscape. The current streamlined procedure for exporting e-marketing or e-business improves the convenience of conducting online commerce, especially with geographically distant countries that may include substantial travel costs. The firm's commercial activities have significantly influenced the advancement of communication and technology. The internet has emerged as the predominant platform for global electronic marketing. Nevertheless, a significant number of firms lack awareness regarding e-marketing techniques and their influence on the export market's performance (Mahmood & Mahmood, 2021). Exports can increase a country's overall production capability and help achieve high-volume output by efficiently using resources. On the other hand, it can also contribute to the decrease in unemployment rates in the country and improve the capabilities of the entire workforce. E-marketing plays a crucial role in the economic growth of businesses and nations, offering a multitude of benefits (Sheikh, Shahzad, & Ishaq, 2017).

The field of marketing science has experienced considerable transformations in recent years, mostly as a result of substantial progress in scientific and technological fields. Moreover, the growing interconnectivity of marketplaces has made buyers susceptible to a wide range of marketing messages. This evolution has significantly altered the marketing science landscape in comparison to its prior condition (Ponkratov et al., 2019). The core idea of marketing is to satisfy human needs, which encompass basic material necessities such as food, clothing, warmth, safety, and a sense of belonging, as well as individual aspirations for knowledge and self-expression. Marketers do not create these criteria; instead, they are an essential component of the human structure (Eid & El-Gohary, 2013). E-marketing is the use of social networks by firms to achieve marketing objectives. It functions as a medium of communication between the company and its customers, facilitating the recognition of specific client requirements and behaviors. Consequently, this enhances the bond between the company and its clients (Shabbir, Jabeen, Aziz, Abbasi, & Gul, 2020). Salome and Ofunre (2019) define e-marketing as the strategic use of the internet and digital technology to achieve

marketing goals and enhance companies' existing marketing strategies. As a result, Internet marketers have the ability to distribute information about their products and businesses more effortlessly and autonomously than traditional marketing techniques.

The importance of e-marketing in marketing lies in its capacity to ascertain the target market and ease the study of marketing sector needs (Alboyosifa & Hadib, 2020). Moreover, providing products that successfully meet consumers' needs by ensuring superior design quality and rigorous compliance with quality standards is advantageous (Anser, Yousaf, Usman, & Yousaf, 2020). Nevertheless, failing to adequately consider quality and compliance while designing may have adverse effects on actual performance and client specifications. Failure to achieve the desired degree of quality will immediately impact performance, ultimately leading to a failure to meet consumer expectations.

Therefore, the consumer regards quality as a combination of product characteristics that meet their needs and expectations while also conforming to the specified standards and norms. The primary benefits of e-marketing are cost savings and expanded client reach. Rangaswamy et al. (2020) argue that digital marketing platforms generally have lower costs compared to traditional marketing platforms, such as face-to-face interactions with salespeople, intermediaries, or distributors. According to Kundu (2021), utilizing email marketing campaigns, web signboards, online directory ads, telemarketing, and other interactive marketing initiatives results in nearly double the return on marketing investment when compared to traditional marketing techniques. Moreover, both enterprises and individuals widely recognize the internet as a search tool.

Hence, firms that are open to adopting digital marketing are at a greater risk of falling behind compared to those that have already accepted this notion (Chaffey & Smith, 2022). Digital marketing provides numerous benefits, including time efficiency, higher response rates, global reach, cost-effective market entry, enhanced conversion rates, continuous marketing, and measurable and expandable communication strategies (Mathur & Arora, 2020). Furthermore, according to Singh, Kumar, and Kalia (2021), e-marketing allows established businesses to reach new markets and create innovative business models, such as virtual organizations. Moreover, it improves the user experience by enabling easier and more convenient screen interactions. According to

Ugolkov et al. (2020), electronic marketing enables businesses to improve their effectiveness and efficiency through client communication.

When investing in e-marketing technology, organizations must be cautious in their decision-making process to avoid any mistakes that could lead to inappropriate implementation amongst firms. Furthermore, a study by Mehmood, Awan, and Zhang (2013) revealed that Internet marketing is the most economically efficient method of maintaining communication with current and prospective buyers for daily business operations, regardless of location. Furthermore, this method only affects the timing and cost of conducting business. Moreover, it has transformed into a dynamic reservoir of knowledge and a highly effective marketing instrument capable of reaching users worldwide. Hence, any company can reap advantages from Internet marketing, regardless of scale or industry. Furthermore, this study is likely to improve our understanding of the key factors that lead to success in export marketing, as well as the role played by the Internet in the achievements of export-oriented firms in developing nations. We anticipate this study's findings will enhance enterprises' capacity in impoverished countries to utilize Internet technology more effectively.

1.2.2. The Role of AI in E-Marketing Strategies

The potential of artificial intelligence to assist customized and targeted marketing operations is one of the most significant advantages of digital marketing strategy. This is one of the most important advantages of artificial intelligence. Organizations are able to more effectively segment their audience, recognize individual preferences and behaviors, and provide personalized information and recommendations in order to improve the overall customer experience (Khatri, 2021). This is made possible through the utilization of data analysis and machine learning algorithms that are powered by artificial intelligence. Enhanced personalization gives companies the capacity to tailor their marketing communications to certain audience groups, which in turn boosts the relevance and success of their digital marketing operations (Zaman, 2022). This ability allows businesses to customize their marketing messages in order to make them more appealing to specific consumers.

Artificial intelligence (AI) capabilities have made it possible for marketers to make use of predictive analytics and gain significant customer insights from massive

datasets. This is made possible by the capabilities of AI. According to Chaitanya et al. (2023), when businesses apply predictive modeling that is driven by artificial intelligence, they are able to more correctly forecast market demands, spot new trends, and estimate customer behavior more precisely. Marketing professionals are able to make judgments based on data, improve their marketing strategies, and allocate resources in a more efficient manner as a result of this (Nair & Gupta, 2020). This allows them to capitalize on possibilities that are developing within the digital ecosystem. When it comes to extracting meaningful insights from unstructured data sources, such as talks on social media, customer reviews, and online interactions, artificial intelligence makes it much simpler to do so. The preferences and emotions of customers are better understood by marketers as a result of this.

Artificial intelligence plays a crucial role in the context of digital marketing, contributing to the enhancement of client connection as well as the overall experience. Using chatbots and virtual assistants that are powered by natural language processing enables companies to provide tailored and real-time customer support, react to queries, and guide consumers through the process of completing a purchase (Stone et al., 2020). Chatbots and virtual assistants are the future of customer service. Furthermore, artificial intelligence makes conversational marketing feasible, which enables organizations to communicate with clients in a manner that is both more engaging and more customized. This is made possible by the capability of conversational marketing. As a result, this contributes to the development of stronger connections and increased brand loyalty. Through the utilization of artificial intelligence, businesses have the capacity to develop more meaningful connections with their audience. This can be accomplished by providing personalized content, product suggestions, and engaging experiences (Abakouy et al., 2023). Because of this, eventually, there is a rise in the levels of involvement and happiness among customers.

The techniques of search engine optimization (SEO) and content marketing have undergone a sea change as a result of the introduction of artificial intelligence in the realm of digital marketing. It is now feasible for marketers to analyze search trends, user intent, and content performance thanks to the availability of tools and algorithms that are powered by artificial intelligence. This enables companies to develop content that is more pertinent and useful, as well as content that resonates with the audience they are trying to reach (Kingsnorth, 2016). In addition, there are content producing technologies

that are powered by artificial intelligence and natural language processing skills that make it feasible for businesses to create high-quality, optimized content at scale. This, in turn, lets businesses to maintain a consistent and impactful online presence (Tsuei et al., 2020). In addition, artificial intelligence assists in optimizing websites and content for search engines, which in turn boosts visibility and generates organic traffic by utilizing modern search engine optimization strategies (Pohjanen, 2019). Utilizing search engine optimization is the means by which one may accomplish all of these benefits.

Marketers have gained new skills in the areas of targeting, optimization, and attribution as a result of the advent of artificial intelligence, which has brought about a significant transformation in the field of digital advertising and media purchasing. According to Chen et al. (2019), businesses are able to optimize the impact of their advertising campaigns by leveraging advertising platforms that are powered by artificial intelligence (AI). This is a promising development for the advertising industry. These platforms make it possible to target audiences with granularity, to create dynamic advertisements, and to engage in continuous bidding. The purpose of ad optimization algorithms that are powered by artificial intelligence is to continually monitor performance data and make adjustments to targeting settings in order to give advertising that are more effective and relevant to the proper audience groups (Qin & Jiang, 2019). Through the provision of insights on optimal ad placements, budget allocation, and performance estimates, artificial intelligence also makes it simpler for marketers to make decisions regarding the purchase of media. According to Vrublevskaia (2021), this helps marketers to make judgments based on accurate information and optimize the return on their advertising efforts made.

Despite the fact that artificial intelligence delivers a plethora of benefits to digital marketing strategy, it is essential to address the ethical concerns and data privacy consequences that are associated with the implementation of digital marketing strategy and artificial intelligence (Ljepava, 2022). According to Huh et al. (2023), it is the obligation of businesses to make the prioritization of data privacy and security a priority in order to safeguard client information. For the purpose of delivering the data that is necessary to feed their algorithms and models, artificial intelligence systems are dependent on vast amounts of data. In addition, ethical concerns are raised in the context of AI-driven customization and targeting. This is due to the fact that companies are

expected to maintain openness and authorization in their data collection and usage methods (Abakouy et al., 2023). It is possible that this will give rise to a great deal of ethical considerations. Tahoun and Taher (2021) state that if businesses conduct their operations in accordance with ethical standards and regulatory rules, they have the opportunity to build trust with their target audience and decrease the potential risks that are associated with marketing activities that are driven by artificial intelligence. An additional significant function that artificial intelligence fulfills in the context of digital marketing strategy is that of automation. Deng et al. (2019) state that with the assistance of tools and platforms that are powered by artificial intelligence, marketers are able to automate operations that are repetitive in nature. Email marketing, social media management, content curation, and content optimization are some of the occupations that fall under this category. According to Rodgers and Nguyen (2022), when businesses automate their marketing activities, they are able to boost their efficiency, streamline their marketing operations, and reallocate their human resources to projects that are more strategic and creative. In addition, the utilization of automation that is powered by artificial intelligence makes it feasible to optimize marketing activities in real time. The reason for this is that algorithms are always monitoring performance data and making modifications to targeting, message, and distribution in order to get the greatest possible results (Rodgers & Nguyen, 2022).

1.3. Conceptual Framework for AI in E-Marketing

The current study examines the inter-relationship between the impact of artificial intelligence (natural language processing, expert systems, automated bots, and consumer data security) and e-marketing. The various variables considered in the current study are illustrated in figure 2.

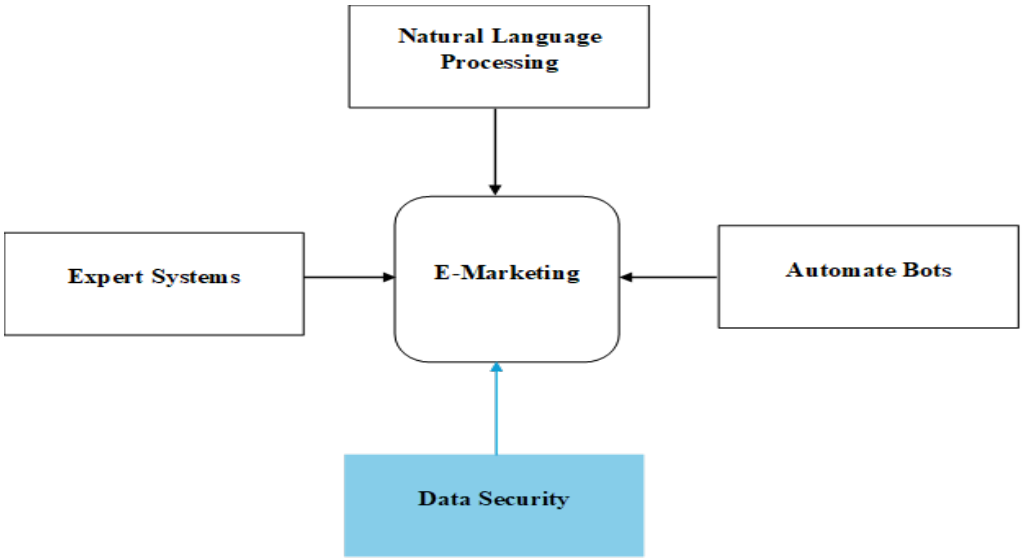

Figure 2: Resarch framework

2. HYPOTHESIS DEVELOPMENT

2.1. Theoretical Foundations

The RBV theory, as explained by Lubis et al. (2022), examines a business organization's internal resources and capabilities that contribute to creating a competitive advantage and improved performance. The RBV theory evaluates the capacities and assets of a business organization and analyzes their characteristics (Mansour et al., 2022). A unique combination of resources and capabilities at the core of a business organization can achieve a sustained competitive advantage and high performance, according to RBV theory (Bhandari et al., 2022). To achieve ongoing competitive advantage and performance, business enterprises must effectively utilize their internal resources, such as AIM, along with its associated factors, like AI-enabled IoT, CDMS, VAR, and personalization.

The Resource-Based View (RBV) hypothesis says that certain "intelligent capabilities" could be made easier for small and medium-sized businesses (SMEs) to create if they use artificial intelligence and its factors, like the internet of things that AI, customer data management systems, value-added resellers, and customization enable. Davenport (2020) highlights that these characteristics should allow small and medium-sized enterprises (SMEs) to effectively communicate and share information with clients, engage in collaborative decision-making, implement experiential marketing strategies, and offer personalized experiences. Therefore, one can only acquire these abilities through continuous development and implementation.

Although AIM is critical for a commercial organization's continuity and survival, researchers are currently working to align AIM with organizational performance. Wu and Monfort's (2023) research, for instance, demonstrates that the adoption of an artificial intelligence (AI) strategy positively impacts performance. Nevertheless, according to Lin et al. (2020), they argue that competitors can easily replicate investment in AIM resources and capabilities. According to Osakwe et al. (2022), the allocation of resources and the development of capabilities in the area of AIM by organizations do not automatically result in a competitive advantage and improved performance. Instead, business enterprises leverage their investments in AIM to cultivate unique AIM resources and competencies that contribute to an organization's overall success (Osakwe et al., 2022). Kaplan and Haenlein (2019) argue that AIM skills, such as IoT, CDMS,

VAR, and personalization, are uncommon and may be unique to specific business organizations. These competencies can result in sustained competitive advantage and improved performance.

Nevertheless, the resource-based view (RBV) has faced criticism over the notion that possessing "rare" resources does not always lead to a competitive advantage and improved performance (Lee et al., 2015). Therefore, it is imperative for business organizations to establish performance measurements that can reliably evaluate the impact of implementing "scarce" resources and capabilities on performance (Ofori & Appiah-Nimo, 2022). The Resource-Based View (RBV) theory is used in this study to look at how AIM works as an important resource and skill that only small and medium-sized businesses (SMEs) can have. The goal is to gain a competitive advantage over industry rivals and improve performance. Also, earlier studies (Stroumpoulis et al., 2022; Osakwe et al., 2022) used the Resource-Based View (RBV) theory to look at how AIM resources, such as CDMS, communication and information sharing (IoT), experience marketing (VAR), and personalization are connected in order to improve performance in areas like learning and growth, customer satisfaction, and financial outcomes.

2.2. Formulation of Hypotheses

2.2.1. The Relationship Between Using Artificial Intelligence Applications (Natural Language Processing) and E-Marketing.

Incorporating artificial intelligence (AI) tools, specifically natural language processing (NLP), into e-marketing tactics has fundamentally transformed how firms engage with customers, tailor experiences, and enhance their marketing endeavors (Kamal & Himel, 2023). The use of NLP in e-marketing is more than just a functional improvement; it greatly enhances the efficiency and efficacy of marketing operations (Raben, 2019). AI-driven NLP technologies have a statistically significant impact on improving e-marketing outcomes by facilitating the implementation of more personalized, engaging, and responsive marketing strategies (Senyapar, 2024).

Natural Language Processing (NLP) enables computers to comprehend, interpret, and manipulate human language to enhance the quality of consumer

interactions (Bahja, 2020). Within electronic marketing, this skill results in numerous significant improvements (Melović, Vulić & Dudic, 2020). Firstly, natural language processing (NLP) facilitates the development of advanced customer care chatbots that provide immediate responses to consumer requests. These bots can comprehend and analyze inputs from users in natural language, enabling them to effectively manage a diverse range of customer care responsibilities. These include addressing often-asked queries, resolving problems, and furnishing comprehensive product details. Enhance customer satisfaction and reduce operational expenses by providing 24/7 support and automating responses. This allows human agents to focus on addressing more intricate problems (Melović, Vulić & Dudic, 2020). Furthermore, NLP plays a role in tailoring marketing messages to individual preferences, a vital element in the effectiveness of digital marketing initiatives (Chaitanya et al., 2023). Natural Language Processing (NLP) systems can customize marketing messages based on personal preferences by examining customer data, including past purchases, browsing history, and social media engagement (Babatunde et al., 2024). Such a degree of customization enhances the pertinence of advertisements and promotional material, thereby increasing user engagement and conversion probability. For example, NLP-powered systems can create customized email marketing campaigns that use the recipient's name and suggest products based on their previous actions and preferences. This greatly increases the number of people who open emails and click on the links (Marr, 2019).

Sentiment analysis is another notable influence of natural language processing (NLP) on electronic marketing (Lin, 2020). Natural Language Processing (NLP) systems can scrutinize consumer feedback, reviews, and social media posts to discern the text's expressed attitude, positive, negative, or neutral (Malik & Bilal, 2023). This information is extremely valuable for brand management and marketing strategy development because it provides an immediate and accurate understanding of customer opinions and emerging patterns. Companies can promptly modify their approach based on client opinion, enhancing their product offerings and customer communications to match market expectations better (Rezapour, 2021). Natural language processing (NLP) benefits search engine optimization (SEO) by improving material searchability and relevancy. NLP algorithms enhance the alignment of web content with user queries by accurately interpreting and matching user intent. As a result, there is increased organic traffic and improved content visibility, both critical for successful online marketing

(Jadhav et al., 2924). Empirical data and market research repeatedly demonstrate that incorporating natural language processing (NLP) into e-marketing strategies substantially improves key performance indicators (KPIs) such as customer engagement, conversion rates, and overall customer satisfaction. Advancements in artificial intelligence (AI) and natural language processing (NLP) technologies expand their capacity to revolutionize e-marketing, promising increasingly complex and effective marketing strategies closely tailored to consumer preferences and habits (Anca, 2023).

2.2.2. The Relationship Between Using Artificial Intelligence Applications (Expert Systems) and E-Marketing.

The incorporation of artificial intelligence (AI) technologies, particularly expert systems, in e-marketing represents a significant advancement in the way firms plan and implement their marketing endeavors (De Bruyn et al., 2020). Expert systems are artificial intelligence (AI) programs specifically created to replicate the decision-making capabilities of human experts (Saba, Sahli & Hadidi, 2021). Within the realm of e-marketing, these systems employ advanced data analysis techniques to offer suggestions, forecast results, and streamline intricate decision-making procedures, ultimately improving the effectiveness and accuracy of marketing campaigns (Gil et al., 2021).

Expert systems in e-marketing utilize artificial intelligence to efficiently handle and evaluate consumer data on a large scale and at a rapid pace, surpassing the capabilities of human marketers (Figueiredo et al., 2024). These systems can analyze consumer activity patterns, purchasing histories, and real-time interactions to detect prospective market trends and client preferences. This feature facilitates the development of tailored marketing messages tailored to the distinct needs and preferences of individual consumers. An expert system can enhance the possibility of conversion by recommending the most suitable time and content for promotional emails to clients, taking into account their past interactions and engagement levels (Teixeira & Remondes, 2023). In addition, expert systems play a role in automating mundane and repetitive processes in e-marketing (De Bruyn et al., 2020. These technologies can enhance the efficiency of managing tasks such as campaign tracking, A/B testing, and response analysis. This automation optimizes operations and allows marketing

professionals to dedicate their efforts to more strategic and creative duties, ultimately increasing productivity and fostering creativity within marketing teams.

Expert systems are critical in e-marketing because they make a significant contribution to predictive analytics (Ward, Marmol, Lopez-Lopez, Carracedo & Juan, 2023). Through the examination of available data and the recognition of recurring trends, these systems have the capability to forecast forthcoming consumer actions with a considerable level of precision. For instance, they have the ability to predict the potential popularity of products by analyzing developing patterns. This allows organizations to make necessary adjustments to their inventory or promotional strategy. By adopting a proactive approach to market needs, businesses may effectively maintain their competitiveness and promptly adapt to evolving consumer preferences (Sadeq, Nassreddine & Younis, 2023).

Integrating expert systems with e-marketing enhances customer care and assistance (Lasi, 2021). These systems have the capability to efficiently manage first-client questions, offer tailored recommendations, and fix typical problems, thereby improving the customer experience. Expert systems foster stronger customer relationships by conducting interactions in a timely and relevant manner, thereby fostering loyalty and trust (Fianto & Dutahatmaja, 2023). Increased efficiency, customized client interaction, and greater decision-making abilities characterize the use of AI applications, such as expert systems, in e-marketing (Hassan, 2021). As these technologies advance, we expect their integration into e-marketing techniques to intensify, offering more advanced tools for understanding and shaping consumer behavior. Employing expert systems strategically in e-marketing enhances marketing performance and confers a substantial competitive advantage in the swiftly changing digital marketplace (Lancée, 2019).

2.2.3. The Relationship Between Using Artificial Intelligence Applications (Automate Bots) and E-Marketing.

The incorporation of artificial intelligence (AI) technologies, specifically automated bots, into e-marketing tactics signifies a significant change in how organizations interact with consumers and oversee digital campaigns (Dutta, Arivazhagan, Padmini Ema & Balasundaram, 2024). These autonomous bots greatly

improve the efficiency and efficacy of e-marketing by automating chores and personalizing interactions (Aghazadeh & Khoshnevis, 2024). Automated bots, commonly known as chatbots in customer service settings, are highly proficient in imitating interactive human conversations and can function continuously (Sheehan, Jin & Gottlieb, 2020). They excel at managing client inquiries, offering product information, and assisting users in navigating the purchase process. The constant availability of services not only enhances the customer experience by offering immediate responses but also allows for the expansion of operations without the need for a corresponding increase in human resources (Lee & Lee, 2020). In e-marketing, this refers to the ability to interact with a significantly larger audience while maintaining the same level of quality in each customer engagement.

Bots specifically gather data from interactions, which can be quite beneficial for improving marketing campaigns (Campbell, Sands, Ferraro, Tsao & Mavrommatis, 2020). This dataset comprises client preferences, behavioral patterns, and feedback, all of which can be examined to customize forthcoming marketing endeavors. For instance, a customer-interacting bot can use the acquired knowledge to tailor marketing messages based on the user's previous interactions, thereby improving the relevance and effectiveness of these messages. Automated bots not only improve customer support but also play a vital role in optimizing marketing operations. They have the ability to automate repetitive processes such as publishing material on social media, distributing email newsletters, and even overseeing ad placements. This automation not only decreases the burden on human personnel but also eradicates the potential for human fallibility, guaranteeing that marketing activities are more uniform and dependable (Patel & Trivedi, 2020).

Furthermore, the use of AI bots in e-marketing facilitates more advanced segmentation and targeting tactics. Bots analyze extensive datasets to identify precise client categories and tailor marketing messages to maximize conversion rates. At this level, precise targeting improves the maximum return on investment (ROI) for marketing campaigns (Elsayed Fayed, 2021). Enhanced operational efficiency, improved client interaction, and more accurate targeting characterize the use of AI applications like automated bots in e-marketing (Ward et al., 2023). As technology advances, Anticipate the increasing significance of automated bots in e-marketing, providing enhanced levels of customization and effectiveness in marketing campaigns

(Raben, 2019). This integration represents not only a passing fad but a significant transition towards marketing approaches that are more interactive, responsive, and data-driven.

2.2.4. The Relationship Between Using Artificial Intelligence Applications (Data Security) and E-Marketing.

The utilization of artificial intelligence (AI) technologies has become more widespread in the field of digital marketing, particularly in the realm of consumer data protection (Chaitanya et al., 2023). As corporations accumulate, retain, and examine large quantities of personal data to create targeted marketing campaigns, ensuring the security of this data becomes of utmost importance. AI applications are critical for strengthening data security measures and supporting e-marketing's overall objectives by fostering confidence and ensuring adherence to legislation (Meghla, 2023). The convergence of artificial intelligence and consumer data security in e-marketing centers around safeguarding sensitive information from unauthorized access and breaches, which can potentially cause significant financial and reputational harm (Pires, Santos, Pereira, & Torres, 2023). AI-powered security systems utilize sophisticated algorithms to monitor and analyze data access patterns, identify irregularities, and autonomously react to possible risks. Machine learning models can analyze past data and identify common user behaviors (Rangaraju, 2023). These models can then identify any suspicious activities that deviate from these patterns. Implementing this proactive security approach can prevent data breaches and minimize the risk of internal threats often overlooked by conventional security systems (Bandari, 2023).

AI enhances encryption technologies' functionalities (Su, Wang, Xu, Wang & Wang, 2024). AI algorithms can enhance encryption by dynamically adjusting security measures according to the data sensitivity level. (Li, Feng, Xiong, Yang & Liu, 2021) This measure ensures that more robust encryption methods safeguard highly sensitive customer data, including financial information and personal identifiers. This significantly reduces the chances of unauthorized parties deciphering this data. In addition, AI can properly handle and protect the large volumes of data produced by online marketing operations, surpassing the capabilities of manual systems

(Muhammadian, 2020). This guarantees the preservation of data integrity and confidentiality across various platforms.

Compliance with data protection regulations, such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in the United States, is another crucial aspect to which AI contributes significantly (Bakare, Adeniyi, Akpuokwe & Eneh, 2024). These regulations mandate strict guidelines on collecting, storing, and using consumer data. AI tools help businesses automate compliance processes by ensuring all data handling procedures meet the required standards (Padmanaban, 2024). Trust is a crucial element in e-marketing (El Saghier, 2021). Consumers are more inclined to interact with firms if they have confidence in safeguarding their personal information (Swani, Milne & Slepchuk, 2021). AI-powered data security bolsters this trust by ensuring consumer data's secure and responsible management (Habbal, Ali & Abuzaraida, 2024). This aids in customer retention and entices new consumers who prioritize careful data management.

Furthermore, using AI in data security enables targeted marketing strategies to be implemented while maintaining privacy (Stone et al., 2020). Through the secure analysis of consumer behavior and preferences, AI may assist marketers in developing highly tailored content that strongly connects with the intended audience, thereby enhancing the efficacy of marketing initiatives (Oseni, Moustafa, Janicke, Liu, Tari & Vasilakos, 2021). Securely managing data enables marketers to employ sophisticated data analytics, which leads to a more profound understanding of customer behavior (Camilleri, 2020). This, in turn, allows for fine-tuning of marketing campaigns and increases the return on investment. The relationship between AI applications in consumer data security and e-marketing is mutually beneficial (Figueiredo et al., 2024). Artificial intelligence improves data security measures, increasing the effectiveness and reliability of e-marketing endeavors (Haliti& Bajrami, 2024).

3. METHODOLOGY AND RESULTS

3.1. Research Design and Data Collection

The structural framework of the research is provided by the study design, which defines the methodical process needed to gather important data and information to develop or handle research questions. The report presents a comprehensive strategic plan with comprehensive information about the company and the research methodology. It is quite helpful in guiding one through the complexities of the study undertaking (Bloomfield & Fisher, 2019).

This study has used a quantitative research approach, generally accepted as the most suitable approach for reaching the goals of the study. In quantitative research, we examine quantifiable variables we can measure and translate into numerical data thereby allowing us to extend our conclusions to a greater population. Mahajan (2022) notes that this method helps to obtain, analyze, and understand research results by means of methodically arranged and quantified data.

The methodical approach of quantitative studies to understand events and their use of numerical data to establish empirical connections define them. Confirming ideas and hypotheses inside the limits of the research depends on a fair assessment of data based on statistical analysis, which this approach helps to achieve. Creswell (2020) claims that this approach involves careful review, observation, theoretical study, and identification and analysis of several elements.

Furthermore, the quantitative approach stands out for its ability to extend results to more general populations, therefore contributing significantly to the field by allowing the derivation of conclusions outside the particular research sample (Bell, Bryman & Harley, 2022). Advancement of knowledge in a given subject depends on the capacity to discern the wider importance of results as it enables standards for comparison, replication, and future research.

The chosen quantitative method and study design provide a methodical and empirical foundation to expose thorough understanding in this investigation. Through methodically compiling and evaluating data, this project aims to improve current understanding. Establishing clear, objective results verifying or refuting the initial idea is its primary goal (Kapur, 2018).

Many techniques are possible in surveys for gathering information. This study gathered the fundamental data for statistical analysis by means of a questionnaire sent among workers of an Istanbul sample of businesses. This method let the research identify an Istanbul sample of businesses. The research used quantitative methods to confirm the conclusions and improve understanding of them. The study used a Google Form to compile survey answers as the efficiency gains and projected broad participation call for it. Simplifying data collecting and raising response rates were goals of the digital approach used.

3.2. Population and Sampling

This section provides an explanation of the projected size of the population as well as the procedure for estimating the sample size for the research project. The major purpose is to offer extensive information on the sample frame and methodology in order to increase the level of comprehension and understanding of the subject matter.

According to Bougie and Sekaran (2019), the term "population" in the context of a research refers to the full selection of persons, events, or other items that are being investigated. According to Cresswell (2020), a population is defined as a collection of persons that share comparable features and characteristics, which makes them appropriate for observation and analysis in the context of a research. We choose a sample from the total population, which consists of departments, organizations, and individuals to whom we will apply the findings of the survey. The population is the entire group from whom we selected the sample.

3.3. Data Analysis Techniques

Data analysis is the process of evaluating, cleaning, inspecting, manipulating, and modeling data in order to discover important information, make inferences, and assist in decision-making. In order to conduct the data analysis and demographics for the research assignment, the study will make use of SPSS version 26.0. The analysis was performed using the SPSS version 26.0 software. The investigation's data may be analyzed using SPSS version 26.0, which has features such as reliability testing and correlation analysis. These features are suitable for investigating the data.

3.4. Results and Findings

3.4.1. Descriptive Statistics

Descriptive statistics provide a quantitative summary that helps in understanding the essential characteristics of the dataset, focusing on central tendency, variability, and distribution. These statistics are particularly valuable in interpreting the respondents' perceptions and behaviors regarding the study's constructs. The mean, or average, represents the central point of the data and gives insight into the overall tendency of respondents' opinions. A higher mean indicates stronger agreement or a more positive perception toward a specific item, while a lower mean suggests less agreement or a more neutral stance. The standard deviation (Std. Deviation) reflects the dispersion or spread of the responses around the mean. A lower standard deviation signifies that the responses are closely clustered around the mean, indicating higher consistency in perceptions. Conversely, a higher standard deviation suggests more varied responses, indicating differing views among respondents. By analyzing the means and standard deviations together, researchers can identify patterns and trends within the dataset. For instance, items with high means and low standard deviations indicate strong and consistent agreement among respondents, signifying areas of clear consensus. On the other hand, items with high standard deviations but moderate means highlight areas where opinions are more diverse, potentially pointing to complex or contentious issues. These descriptive measures not only summarize the data but also serve as a foundation for deeper statistical analysis, enabling researchers to explore relationships, test hypotheses, and draw meaningful conclusions about the constructs being studied.

Table 1: Descriptive statistics

Variables	Code	Items	Mean	Std. Deviation
E-marketing	**EM1**	The company uses e-marketing for its marketing campaigns.	3.57	1.185
	EM2	E-marketing has contributed to improving customer experience.	3.40	.967
	EM3	The company's use of e-marketing reduced customer complaints.	3.29	1.019
	EM4	The company realizes the necessity of e-marketing via (search engines, email, and content) to achieve the company's competitive advantage.	3.33	1.022
	EM5	The company's use of e-marketing has increased the percentage of customers.	3.51	.972
	EM6	The company's use of e-marketing has increased sales.	3.34	.938
	EM7	The company's use of e-marketing improved its level of satisfaction.	3.42	.979
Natural Language Processing	**NLP1**	The company understands the need to introduce AI applications for search engine promotion.	3.27	.862
	NLP2	The use of artificial intelligence applications increased the percentage of sales.	3.35	1.005
	NLP3	The company gained more customers when using AI when promoting through search engines.	3.28	1.002
	NLP4	Intelligence applications helped develop e-marketing.	3.34	.922
	NLP5	Speech and natural language recognition has helped develop cross engine advertising.	3.36	.931

Expert System	**ES1**	The company realizes the importance of e-marketing in achieving a competitive advantage.	3.39	1.015
	ES2	The company understands the importance of artificial intelligence in achieving a competitive advantage.	3.28	.924
	ES3	Artificial intelligence applications have increased the opportunity to reduce the cost of products.	3.36	1.046
	ES4	E-marketing has achieved excellence in the company's products.	3.38	.943
	ES5	Artificial intelligence has effectively contributed to increasing product quality.	3.34	.985
Automate Bots	**AB1**	Marketing companies use social networking sites such as Instagram.	3.41	1.003
	AB2	The company realizes the need to include intelligence applications in its marketing campaigns through communication sites.	3.32	.868
	AB3	The percentage of sales and the number of customers increased when using intelligence applications through communication sites.	3.33	1.083
	AB4	The number of customers increased when using intelligence applications through communication sites.	3.22	.996
	AB5	The company uses automated bots to respond to customers in customer service.	3.38	.928
	AB6	The company use Intelligence applications developed for marketing through communication sites.	3.40	.858
Consumer Data Security	**CDS1**	Our AI-driven security measures have significantly enhanced the protection of consumer data on our e-marketing platforms.	3.32	.896

CDS2	The implementation of AI in data security has noticeably improved consumer trust in our e-marketing services.	3.36	.956
CDS3	The return on investment (ROI) from AI technologies applied to data security justifies the initial and ongoing costs.	3.44	.867
CDS4	Our AI-driven data security measures align well with current data protection regulations and standards.	3.30	.868
CDS5	We face significant challenges in integrating and maintaining AI systems for data security within our e-marketing platforms.	3.30	1.020

Table 1 provides detailed descriptive statistics for the variables examined in the study, highlighting the respondents' perceptions of their roles in achieving organizational objectives. For **E-marketing (EM),** items such as *EM1: The company uses e-marketing for its marketing campaigns* scored the highest mean of 3.57, indicating strong recognition of its importance, while *EM3: The company's use of e-marketing reduced customer complaints* scored slightly lower at 3.29, reflecting moderate agreement. The standard deviations (0.938 to 1.185) indicate varying degrees of response consistency. **Natural Language Processing (NLP)** items, such as *NLP5: Speech and natural language recognition have helped develop cross engine advertising* scored the highest mean of 3.36, suggesting its perceived contribution to advertising development, while *NLP1: The company understands the need to introduce AI applications for search engine promotion* had the lowest mean of 3.27, showing some variability in perceptions (Std. Dev. 0.862 to 1.005). For **Expert Systems (ES),** items like *ES1: The company realizes the importance of e-marketing in achieving a competitive advantage* scored a mean of 3.39, reflecting strong agreement, whereas *ES2: The company understands the importance of artificial intelligence in achieving a competitive advantage* scored a slightly lower mean of 3.28. The standard deviations (0.924 to 1.046) indicate moderate variability in responses. These findings suggest generally positive perceptions of the variables, with some variability reflecting differing levels of agreement on specific aspects.

3.4.2. Reliability Analysis

Reliability analysis evaluates the internal consistency of measurement scales to ensure that items within a construct produce consistent results. One of the most widely used measures of reliability is Cronbach's Alpha (α), which assesses how closely related a set of items are as a group. According to Hair et al. (2010), a Cronbach's Alpha value of 0.7 or higher is generally considered acceptable, while values above 0.8 indicate good reliability. This analysis is crucial for determining the reliability of constructs, especially when dealing with multi-item scales. By assessing Cronbach's Alpha, researchers can ensure that the scales used are dependable and suitable for further analysis.

Table 2: Reliability analysis for the constructs

Variables	N of Items	Cronbach's Alpha
E-marketing (EM)	7	0.84
Natural Language Processing (NLP)	5	0.765
Expert System	5	0.805
Automate Bots (AB)	6	0.838
Consumer Data Security (CDS)	5	0.8

Table 2 presents the reliability analysis for the constructs in this study, indicating the internal consistency of their measurement scales. Each variable is assessed by the number of items (questions or indicators) and its Cronbach's Alpha value. All variables demonstrate acceptable reliability, with Cronbach's Alpha values exceeding the threshold of 0.7, ensuring that the scales are dependable. E-marketing (EM) and automated bots (AB) show high reliability with scores of 0.84 and 0.838, respectively, while Natural Language Processing (NLP) and Consumer Data Security (CDS) exhibit moderate reliability with scores of 0.765 and 0.8. Expert System also demonstrates good reliability with a score of 0.805. These results confirm that the constructs are consistent and suitable for further analysis.

3.4.3. Hypothesis Testing

Hypothesis testing examines the direct relationships between independent variables and the dependent variable, providing insights into the predictive strength and statistical significance of the associations. Regression analysis is a commonly used method for testing such hypotheses, where the R-squared (R^2) value indicates the proportion of variance in the dependent variable explained by the predictors, and the Adjusted R-squared accounts for the number of predictors in the model, ensuring a more accurate measure of goodness-of-fit. The ANOVA F-test evaluates the overall significance of the model, confirming whether the predictors collectively explain the variation in the dependent variable. Additionally, the Coefficients table provides detailed information on the contribution of each independent variable, including the standardized Beta coefficients, t-values, and significance levels (p-values). A p-value below 0.05 is considered statistically significant, indicating that the corresponding variable has a meaningful impact on the dependent variable (Field, 2013).

Table 3: Model summary, ANOVA, and coefficients

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	
1	0.876	0.767	0.762	0.35329	
Model	**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
Natural Language Processing	0.463	0.081	0.434	5.738	0.000
Expert System	0.251	0.08	0.256	3.142	0.002
Automate Bots	0.003	0.081	0.003	0.041	0.967
Consumer Data Security	0.243	0.078	0.231	3.094	0.002
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	81.371	4	20.343	162.982	0
Residual	24.714	198	0.125		

Total	106.084	202	

Table 3 provides the results valuable insights into the direct relationships between the independent variables (Natural Language Processing, Expert System, Automate Bots, and Consumer Data Security) and the dependent variable (E-marketing), highlighting their respective contributions to enhancing E-marketing strategies. The model summary reveals a strong positive correlation between the predictors and E-marketing, with an R-value of 0.876 and an R-squared value of 0.767, indicating that 76.7% of the variance in E-marketing is effectively explained by these variables. This high explanatory power underscores the collective importance of the predictors in driving E-marketing outcomes. Furthermore, the Adjusted R-squared (0.762) validates the robustness of the model, while the low Standard Error of the Estimate (0.35329) suggests high precision in predicting E-marketing effectiveness.

The ANOVA results further confirm the significance of the model, with an F-statistic of 162.982 and a p-value < 0.001, indicating that the predictors collectively contribute significantly to explaining variations in E-marketing. These findings reinforce the importance of integrating advanced technologies and data security measures in marketing strategies to achieve competitive advantages.

In terms of individual predictors, Natural Language Processing (Beta = 0.434, p < 0.001) emerges as the strongest contributor, emphasizing its critical role in optimizing E-marketing efforts, particularly through its application in search engines and personalized customer interactions. Expert System (Beta = 0.256, p = 0.002) also shows a significant positive impact, highlighting its influence in enhancing decision-making processes and operational efficiencies in marketing. Consumer Data Security (Beta = 0.231, p = 0.002) demonstrates meaningful significance, underscoring the role of secure and trustworthy practices in building consumer confidence and improving E-marketing performance. Conversely, Automate Bots (Beta = 0.003, p = 0.967) does not exhibit a significant impact, suggesting that while automation technologies may streamline processes, their contribution to overall E-marketing effectiveness in this context is minimal.

Overall, the findings highlight that organizations aiming to optimize their E-marketing strategies should prioritize investments in Natural Language Processing,

Expert Systems, and Consumer Data Security while reassessing the role and integration of automated bots. These results provide actionable insights for managers and decision-makers seeking to leverage advanced technologies to enhance marketing performance and achieve competitive advantages.

DISCUSSION AND CONCLUSION

All of the findings from the hypothesis tests that were discussed in the fourth chapter have been documented in the chapter that came before it. The purpose of this chapter is to provide a comprehensive analysis of the data that was gathered, making connections between it and the four research questions that were presented in the first chapter. The goals of the thesis are intended to be accomplished through this alignment. The analysis of the results is provided within the context of relevant theoretical frameworks, and it is supported by the findings of the research investigation as well as previous investigations that have been documented in the existing body of literature. In addition to that, the chapter discusses limitations and offers recommendations for further researchers.

Recapitulation of the Study

One of the key objectives of this research is to investigate the influence that artificial intelligence has on online marketing. This study utilized a quantitative survey, and the selection of the sample was carried out through the use of a random sampling approach. Data was collected from employees of various organizations operating in Istanbul who freely participated in the study by filling out a questionnaire. As a result, the data was collected effectively. Following a period of communication for a period of two months via email, a total of twenty-three questionnaires were issued to the participants who were linked with the firms that were functioning in Istanbul.

The Relationship Between the Construct Variables

This study analyzes the complex interrelations among several AI-driven constructs Natural Language Processing (NLP), Expert Systems, Automated Bots (AB), and Consumer Data Security (CDS) and their cumulative effect on E-marketing. The contribution of each component to the improvement of marketing strategies was evaluated using Pearson's correlation, regression analysis, and hypothesis testing.

The investigation demonstrated significant interdependencies among the constructs. Pearson's correlation revealed substantial positive associations between

variables, with correlation values of 0.846 for NLP and E-marketing, and 0.847 for NLP and AB. These findings highlight the synergistic functions of AI technology in facilitating marketing success. Regression analysis corroborated these results, revealing a R^2 value of 0.767, which indicates that 76.7% of the variation in E-marketing outcomes is accounted for by the independent variables.

NLP was identified as the most significant predictor of E-marketing performance (Beta = 0.434, $p < 0.001$). NLP enables tailored client interactions and enhances search engine optimization, making it essential in contemporary digital marketing. Expert Systems (Beta = 0.256, $p = 0.002$) significantly contributed to the improvement of decision-making processes and operational efficiency. Likewise, Consumer Data Security (Beta = 0.231, $p = 0.002$) had a crucial role in fostering consumer trust, underscoring the need of secure and compliant marketing tactics.

In contrast, Automated Bots (Beta = 0.003, $p = 0.967$) did not have a significant direct effect on E-marketing results in this setting. Although automation enhances customer contacts and assistance, its efficacy may rely on certain applications and integration methodologies.

These results indicate that firms seeking to enhance their E-marketing strategy should prioritize investments in Natural Language Processing, Expert Systems, and Decision Support. Utilizing these technologies, enterprises may augment consumer interaction, refine decision-making, and foster confidence in digital platforms. The function of Automated Bots need reassessment to more effectively fit with company objectives. The findings underscore the synergistic potential of AI constructs, highlighting their combined impact on the advancement of contemporary E-marketing methods.

Theoretical Contributions

This study offers substantial theoretical contributions by enhancing the comprehension of AI-driven advancements in the digital marketing sector. Initially, it formulates an extensive framework that amalgamates essential AI components Natural Language Processing (NLP), Expert Systems, Automated Bots (AB), and Consumer Data Security (CDS) to assess their combined and distinct effects on E-marketing. This

comprehensive viewpoint addresses the deficiency in current literature, which often analyzes various technologies separately. The research underscores the significance of Natural Language Processing as a crucial factor in E-marketing success, providing actual proof of its contribution to improving consumer interaction and optimizing search engine marketing. This study underscores the substantial predictive capability of NLP, establishing it as a fundamental element of efficient digital marketing strategies and enhancing theoretical models that prioritize customization and efficiency.

The results underscore the significance of Consumer Data Security in cultivating consumer trust and ensuring compliance, hence enhancing theoretical discourse on the interaction between AI technology and ethical issues in marketing. This corresponds with current issues about data privacy and compliance with regulations in digital contexts. The limited influence of Automated Bots on E-marketing undermines current notions of their general application. This subtlety enhances theories of AI adoption by indicating contextual constraints and providing insights for strategic implementation. This study enhances theoretical underpinnings by introducing a comprehensive approach to AI technologies in E-marketing, facilitating further investigations into their dynamic influence on competitive digital marketing environments.

Managerial Implications

This study's conclusions provide several practical recommendations for managers aiming to enhance their digital marketing efforts. The report highlights the essential need to invest in AI technologies, including Natural Language Processing (NLP), Expert Systems, and Consumer Data Security (CDS), to improve marketing efficacy and secure competitive advantages. NLP has emerged as the predominant component in facilitating E-marketing success. Managers have to emphasize the integration of NLP applications, including as chatbots, sentiment analysis, and search engine optimization, to provide tailored customer experiences and enhance engagement. These technologies not only improve customer happiness but also elevate conversion rates by customizing marketing strategies to align with consumer preferences.

Secondly, the pivotal function of Expert Systems underscores the need to use AI to enhance decision-making processes. Managers need to use expert systems for campaign optimization, predictive analytics, and resource allocation to enhance

operational efficiency and improve marketing effectiveness. These technologies facilitate data-driven decision-making, reducing dependence on intuition and improving precision. Thirdly, Consumer Data Security shown its importance in cultivating trust and loyalty among customers. Managers must guarantee the execution of stringent AI-driven security protocols to protect consumer data. Adherence to regulatory requirements and clear explanation of security policies may enhance customer trust and fortify brand reputation. The research revealed a negligible direct effect of Automated Bots on E-marketing results. Managers must to reevaluate their deployment techniques, concentrating on certain scenarios where automation might enhance human efforts rather than supplant them totally.

Limitations

This research on the "Impact of Artificial Intelligence on E-marketing," while its substantial contributions, has numerous flaws that need acknowledgment. The study mostly use a quantitative methodology, using structured questionnaires to collect data. This strategy yields significant statistical insights but may lack the depth and context that qualitative methods, such as interviews or case studies, may give. Investigating these viewpoints may uncover more subtleties about AI's influence on E-marketing. Secondly, the research concentrates on a distinct array of AI constructs Natural Language Processing, Expert Systems, Automated Bots, and Consumer Data Security. Although these elements are important, they do not represent the whole of AI technologies impacting E-marketing, including machine learning algorithms for predictive analytics and augmented reality tools for consumer engagement. Subsequent study may broaden its focus to include these nascent technologies. Thirdly, the study sample mostly comprises experts from certain sectors and geographic areas, thereby limiting the generalizability of the results. Cultural, economic, and sectoral disparities may affect the acceptance and efficacy of AI in marketing, necessitating more extensive and diversified research.

Recommendations for Further Research

To expand upon the conclusions of this study about the "Impact of Artificial Intelligence on E-marketing," various directions for further research are suggested. Future study should use a mixed-methods strategy that integrates quantitative and qualitative methodologies. Integrating interviews, focus groups, or case studies may provide profound insights into the intricate ways AI technology affect marketing tactics and customer behavior. The domain of AI constructs must be broadened to include new technologies, including predictive analytics, augmented reality, machine learning, and generative AI models. These technologies are gaining prominence in E-marketing and may uncover other elements that enhance its efficacy. Longitudinal studies are essential to monitor the enduring effects of AI integration in E-marketing. As AI technologies advance swiftly, longitudinal research may document the evolving trends, difficulties, and opportunities across time, providing a more thorough understanding of their significance. Furthermore, interdisciplinary and intercultural research would provide significant insights into the impact of sectoral and regional differences on the acceptance and efficacy of AI in marketing. This would improve the generalizability of results and pinpoint context-specific tactics. Future study should investigate the ethical ramifications and customer views of AI in marketing, specifically with privacy, prejudice, and transparency. Addressing these factors can enhance ethical and sustainable AI-driven marketing methods.

Conclusion

This study thoroughly examined the "Impact of Artificial Intelligence on E-marketing," emphasizing the contributions of Natural Language Processing (NLP), expert systems, automated bots, and consumer data security (CDS) in influencing contemporary marketing techniques. The results indicate that AI technologies substantially improve the efficacy, efficiency, and accuracy of e-marketing strategies, presenting both potential and problems. Crucial findings indicated that NLP is an essential catalyst for e-marketing success, enabling individualized customer interactions, effective search engine optimization, and improved consumer engagement. Organizations recognized expert systems as revolutionary instruments that optimize decision-making and predictive analytics, enabling them to anticipate customer demands

and adapt their tactics proactively. CDS has become crucial for cultivating consumer trust and ensuring compliance, highlighting the need for safe data processes in maintaining the legitimacy of digital marketing.

Nevertheless, automated bots have shown little direct impact on e-marketing results in this environment, suggesting a need for tailored and context-specific implementation tactics. The study underscored the interdependence of different technologies, stressing the need to combine AI systems to have a synergistic impact on marketing success. Even though it made important contributions, this study had some problems. For example, it focused too much on certain AI concepts and used only quantitative methods, which meant that it might have missed important qualitative findings. Future studies should use mixed techniques, investigate future AI technologies, and analyze cross-cultural and industry-specific differences in AI adoption. In conclusion, AI is not only a technical advancement but also a revolutionary force that is transforming e-marketing. Through the strategic use of AI technology, firms may gain enhanced consumer engagement, operational efficiency, and competitive advantage, facilitating future advancements in the digital marketing arena.

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APPENDIX A

Ek 1 **:** Research Questionnaires

Dear Respondents,

You are invited to participate in this survey, “Impact of Artificial Intelligence on E-marketing”: This research fulfils my Master of Business Management from Karabuk University. I would appreciate it if you could spare some time to think about completing the survey. I hope that you will cooperate in completing the questionnaire to the best of your ability. This questionnaire consists of three parts/sections. Part, one consists of questions about your demographic profile; continue with part two about the Impact of E-marketing; and the third part about Artificial Intelligence (Natural language processing, Expert system, Automate bots and Consumer Data Security). All information provided in this survey will by no means reflect the identity of the participants. It will be kept strictly confidential and used merely for academic purposes.

THANK YOU

SECTION A: Demographic

2. GENDER

Male	Female

3. Age

18-30	31-40	41-50	Above 50

4. Education Level

Bachelors	Higher Diploma	Masters	Ph.D.

5. Service Length

Less than 5	6-10	11-15	Above 15

6. Experience

1-3 years	4-6 years	7-10 years	Above 10 years

7. Speciality

Marketing	Artificial Intelligence	Other

8. Title

Higher manager	Middle manager	Employee

SECTION E: E-marketing

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	The company uses e-marketing for its marketing campaigns.					
2	E-marketing has contributed to improving customer experience.					
3	The company's use of e-marketing reduced customer complaints.					
4	The company realizes the necessity of e-marketing via (search engines, email, and content) to achieve the company's competitive advantage.					
5	The company's use of e-marketing has increased the percentage of customers.					
6	The company's use of e-marketing has increased sales.					
7	The company's use of e-marketing improved its level of satisfaction.					

SECTION B: Natural Language Processing

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	The company understands the need to introduce AI applications for search engine promotion.					
2	The use of artificial intelligence applications increased the percentage of sales.					
3	The company gained more customers when using AI when promoting through search engines.					
4	Intelligence applications helped develop e-marketing.					
5	Speech and natural language recognition has helped develop cross engine advertising.					

SECTION C: Expert System

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	The company realizes the importance of e-marketing in achieving a competitive advantage.					
2	The company understands the importance of artificial intelligence in achieving a competitive advantage.					
3	Artificial intelligence applications have increased the opportunity to reduce the cost of products.					
4	E-marketing has achieved excellence in the company's products.					
5	Artificial intelligence has effectively contributed to increasing product quality.					

SECTION D: Automate Bots

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	Marketing companies use social networking sites such as Instagram.					
2	The company realizes the need to include intelligence applications in its marketing campaigns through communication sites.					
3	The percentage of sales and the number of customers increased when using intelligence applications through communication sites.					
4	The number of customers increased when using intelligence applications through communication sites.					
5	The company uses automated bots to respond to customers in customer service.					
6	The company use Intelligence applications developed for marketing through communication sites.					

SECTION F: Consumer Data Security

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	Our AI-driven security measures have significantly enhanced the protection of consumer data on our e-marketing platforms.					
2	The implementation of AI in data security has noticeably improved consumer trust in our e-marketing services.					
3	The return on investment (ROI) from AI technologies applied to data security justifies the initial and ongoing costs.					
4	Our AI-driven data security measures align well with current data protection regulations and standards.					
5	We face significant challenges in integrating and maintaining AI systems for data security within our e-marketing platforms.					

CURRICULUM VITAE

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