The Integration of Artificial Intelligence in Business Communication Channels: Opportunities and Challenges

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Abstract: - The development of artificial intelligence is the most intriguing technological advancement of the twenty-first century. Artificial intelligence has become a ubiquitous tool in modern times, and the business industry is no exception. Even though AI is still emerging, it has already had a significant impact on the business sector. It has enabled business managers to devise creative methods to package and even convey the final product to the consumer. The purpose of this study is to examine the different opportunities and challenges associated with the integration of artificial intelligence in business communication channels. Data was collected from 384 business and technology experts in Greece using a well-designed questionnaire. The business sector is going through a significant change in how it interacts with consumers and other companies. AI has been effectively used in several business areas, including biometrics, chatbots, robots, integrated buying and inventory, recommendation and suggestion engines, and kiosks. In addition to keeping up with the rapid advancements in artificial intelligence, it is also assisting in the transformation of consumer behavior and the business sector. Undoubtedly, the industry has benefited much from the deployment of artificial intelligence, but many individuals are still ignorant of its potential. The findings highlight key issues that are unique to businesses driven by AI. The results provide light on the particular complexity and difficulties that businesses may run into when using AI in business procedures by identifying these difficulties.

Key-Words: - Chatbots, Artificial Intelligence, Speech Recognition, Natural Language Processing (NLP), Business Communication Channels, Email Filtering.

1 Introduction

The rise of AI has been an important factor of change being seen in the current fast-changing corporate environment, [1], [2]. AI has revolutionized the business landscape through its power to perform data analysis, automate processes, and make intelligent decisions, [3]. The core drivers of this change as well as the substantial impacts of Companies are starting to apply AI to solve complicated issues and their respective significance. Applications of AI can be seen in machine learning, data analysis, process automation, and natural language processing, [4], [5], [6], [7]. Artificial intelligence technologies are being applied to improve consumer satisfaction and efficiency, as well as promote innovation in multiple sectors including, [8], [9], [10]. [11], pointed out that AI integration into business workflows was involved and affected variety of areas ranging from industries to businesses. Support and customer services have always been the important parts of all companies in any area, [12]. These duties are crucial for responding to any questions from the customers, fixing any problems, and eventually ensuring the

happiness, [12], [13]. Traditional customer service methods are experiencing some shortcomings. So there is a shift towards more effective, advanced, and improved approaches, [14]. In previous cases, human employees were applied generally for face-to-face, phone, or email communications, [15]. No doubt human interaction is vital for developing and solving problems, but unfortunately, the scale, availability, and consistency are limited. This is a trend that becomes more evident in the digital age where the client always wants instantaneous service and 24-hour accessibility, [15], [16]. Some of these problems have already been addressed by the creation of automation and AI technology. Chatbots and virtual assistants, powered by AI and ML technologies, are commonly seen as the next generation of customer service and support tools. These technologies are powered by deep learning algorithms and natural language processing (NLP) and can comprehend customer inquiries instantly and reply on the go, [17]. Particularly adept at managing mundane and repetitive jobs like processing orders, responding to commonly requested queries, and offering basic troubleshooting advice are chatbots, [18]. Conversely, virtual assistants have more sophisticated features that allow for more intricate interactions and customized replies, [19]. The promise of cost savings, higher efficiency, and better client experiences is what is driving the transition toward AI-driven customer service, [20], [21].

AI-driven chatbots are being employed in commerce these days for a variety of purposes, most of which are aimed at improving customer service applications, [22]. Customers may submit questions at any time, particularly when human agents are not accessible, and get individualized advice, assistance, and support, among other benefits, [23]. Businesses that use AI chatbots may also benefit from lower staffing expenses for human support staff, handling several consumers at once, and more customer engagement, which is directly linked to higher revenue, [24]. Notwithstanding these benefits, using artificial intelligence chatbots to raise customer happiness has several drawbacks and restrictions, [25]. This might include a variety of problems, such as the limited capacity to decipher the purpose and content of user communications and the challenges associated with producing natural language answers that are meant to resemble human behavior, [26]. Furthermore, human beings naturally can comprehend, identify, and react to the feelings and experiences of others, even in the face of barriers preventing chatbots from recognizing and expressing empathy in conversation, [24]. As [3] noted, the integration of more sophisticated chatbots with NLP skills is restricted and not often used in e-commerce. However, it is important to look at integrating NLP capabilities into E-commerce chatbots given the possible advantages and untapped prospects, [27], [28].

1.1 Problem Statement
The fast development of artificial intelligence (AI) technologies has led to improvements in communication channels within organizations, where AI plays a big role in this area. Although AI proves to be a remarkable tool in reconstructing business communication with applications such as chatbots, email filtering, speech recognition, and NLP among others, the road to integration is not without constraints and risks. The benefits of AI in the area of customer service and internal communications where a lot has been said are not sufficient to cover the entire implications that the technology has in business communication.

Conversely, there is a double-sided aspect to AI in terms of the quality and kind of customer interactions it has. On the other hand, AI-enabled solutions such as chatbots which have unmatched ability to enhance customer experience and level of engagement are readily available contributing to the satisfaction of customers, [3], [4]. Nevertheless, there is a risk of human element loss in customer service and AI's incapability to comprehend complex human emotions and subtleties raising issues, [5], [6]. Moreover, although advanced AI technologies have shown the potential for increased efficiency and data management through email filtering and analytics, such capabilities are still under tremendous uncertainty of accuracy in terms of the prioritization and protection of sensitive data.

In addition, the use of speech recognition and NLP brings forward a new horizon with its array of possibilities and obstacles. The ability of these technologies to create more natural and user-friendly modes of interaction is obvious for everyone, [9], [10]. Nevertheless, the adequacy and efficiency of these tools in multicultural and language contexts, as well as the lasting effect on the workers, especially on writing and analytical thinking, are issues that need deeper scrutiny, [11], [12]. The existing research gap requires designing a holistic framework

to optimize the AI integration into the communication channels used by businesses that maximize efficiency and personalization while preserving the most critical human features. Additionally, the role of AI in business communication calls for the exploration of strategies for mitigating the limitations and challenges arising from the use of AI, ensuring that they complement the human aspect rather than displacing it. Therefore this study focuses on analyzing the complex influence of AI on business communication channels and providing guidelines on how to maximize the benefits of AI while making sure that people and human connections are not compromised when AI is being used in the business context.

1.2 Purpose of the Study

The purpose of this study was to examine the opportunities and challenges associated with the integration of Artificial Intelligence in Business Communication Channels. The study was also based on the following objectives:

1. To examine the use of chatbots and Virtual Assistants in enhancing communication in businesses
2. To assess the benefits of email Filtering towards effective Business Communication
3. To examine the influence of Speech Recognition in Effective Business Communication
4. To examine the use of Natural Language Processing (NLP) in enhancing communication in businesses
5. To establish the challenges associated with the integration of artificial intelligence in business communication channels

1.3 Research Hypotheses

Hypothesis One (H1): Chatbots and Virtual Assistants have a positive and significant use in enhancing communication in businesses.
Hypothesis Two (H2): Email filtering has positive benefits that help in enhancing the effectiveness of business Communication
Hypothesis Three (H3): Speech recognition has a positive and significant influence on business Communication
Hypothesis Four (H4): Natural Language Processing (NLP) has a significant effect on enhancing communication in businesses

2 Literature Review

2.1 Uses of Chatbots and Virtual Assistants

Chatbots are becoming more widely acknowledged in the literature as a significant technology advancement that enhances customer service. Few studies have looked at the usage of chatbots. For instance, [29] found that consumers' acceptance of chatbots may be decided by several aspects, such as the authenticity of conversation, perceived utility, and perceived pleasure. This is based on the technological acceptance model and satisfaction theory. On the contrary, although several earlier studies have looked at the adoption of chatbots in different sectors, such as textiles and telecoms, very few have looked at the actual usage of chatbots, [3], [20].

Factors like perceived customization and website aesthetics may have an impact on chatbot adoption, [30]. According to a recent study [20], people who get along well with chatbots may communicate with them for prolonged periods. Both studies examined chatbot use from the perspective of the customer and within the framework of mobile services, [15], [26]. A cutting-edge method of communicating with clients is via chatbots. According to [9], chatbots' anthropomorphic traits help to improve users' experiences. Getting better information and services may make customers happier, [17], [20], [24]. [31], claim that chatbots may help companies provide their customers with high-quality services and gain a variety of benefits, such as happy customers and word-of-mouth referrals. More recently, [15] has shown that anthropomorphism (identification, short conversation, empathy) and satisfying basic demands increase the likelihood of consumer compliance. To sum up, companies have started using chatbots to help customers in an attempt to improve customer satisfaction and customer service, [8].

The use of chatbots and virtual assistants in wireless service customer support is a crucial aspect of their integration, [26]. To effectively use AI-driven technologies, service providers need to have strong natural language processing (NLP) capabilities, choose the right platforms, and seamlessly integrate these technologies into their present customer support systems, [32]. This entails using machine learning algorithms to constantly improve chatbot answers by teaching them to learn from encounters, [20]. Facilitating multichannel communication via integration with websites and

messaging applications improves user accessibility. According to [33], the deployment process necessitates a detailed comprehension of customer requirements, the improvement of the chatbots' knowledge bases, and the calibration of their replies to conform to the tone and identity of the brand. Sufficient testing is necessary to guarantee a precise understanding of user inquiries, effective transfer of complicated problems to human agents, and constant performance monitoring, [34]. Wireless service providers may maximize operational efficiency while streamlining customer questions, offering quick answers, and improving user engagement via the smart usage of chatbots and virtual assistants, [9].

Chatbot classification is one of the taxonomies; it includes notification, process, and conversational (Table 1). In particular, conversational chatbots are becoming more and more common. The same queries are often posed by customers to customers, [12]. Answering a broad variety of inquiries at various times becomes nearly usual to maintain high quality of service and customer satisfaction. Remember that a satisfied client has a big impact on the success of the business from the brand's perspective, [5], [15], [24].

Table 1. Classification of chatbots and sample tasks

Type of chatbot	Communication method	Examples
Notifying	One-way user communication that functions like a "newsletter" and delivers notifications in line with a predetermined timetable [9].	Notifications about shipments, local and international news, and weather forecasts
Process	The procedure lets the user follow a preset, linear process that necessitates making several judgments from a limited set of options.	Purchasing movie tickets, doing online shopping over Messenger, choosing a vacation package from a travel agency, and completing an application to create a bank account
Conversational	Enables users to have informal conversations and respond to inquiries in their native tongue by following instructions, [35].	The FAQ office's implementation

2.2 Benefits of Email Filtering

Attackers often exploit email communication as a means of entry into the targeted organization since it is an essential component of daily business operations. Hacking is a major problem, and both distributed denial of service assaults and attacks on cloud server management flaws are steadily evolving [8]. Attackers possess the ability to transmit potentially harmful material, such as links to risky websites or malware files, to the receiver via email messages. One of the several detrimental repercussions that these assaults usually have on the organization is the loss or leaking of important data. Phishing begins with a phony email or other kind of communication that is meant to lure a target. The communication is crafted to seem as if it was sent from a trustworthy source. If the target becomes a victim, they may be persuaded to provide personal information, usually on a fraudulent website, [30], [36], [37].

[38], noted that many Internet service providers (ISPs) use spam filters at every network tier, such as in front of email servers or at mail relay locations where firewalls are present. A network security system called a firewall keeps an eye on and controls incoming and outgoing network traffic by pre-established security standards. At the network border, the email server functions as an integrated anti-virus and anti-spam solution, offering comprehensive safety protection for email, [15], [39]. To act as a bridge between certain endpoint devices, filters may be installed in clients, where they can be installed as add-ons in PCs [27]. Filters prevent unwanted or suspect emails from entering the computer system and pose a danger to network security. Additionally, the user may have a personalized spam filter at the email level, which will prevent spam emails based on predetermined criteria, [36], [40].

According to [41], over 20% of emails based on permission often end up in the wrong person's mailbox. To reduce the risks that email users face from ransomware, malware sent via emails and phishing, email providers have developed a variety of technologies for use in email anti-spam filters, [39]. Each incoming email's risk level is determined by the procedures. Sufficient spam restrictions, sender policy frameworks, whitelists and blacklists, and receiver verification tools are a few examples of these systems, [20]. More spam may get past the spam filter and into users' inboxes when the acceptable spam threshold is set too low.
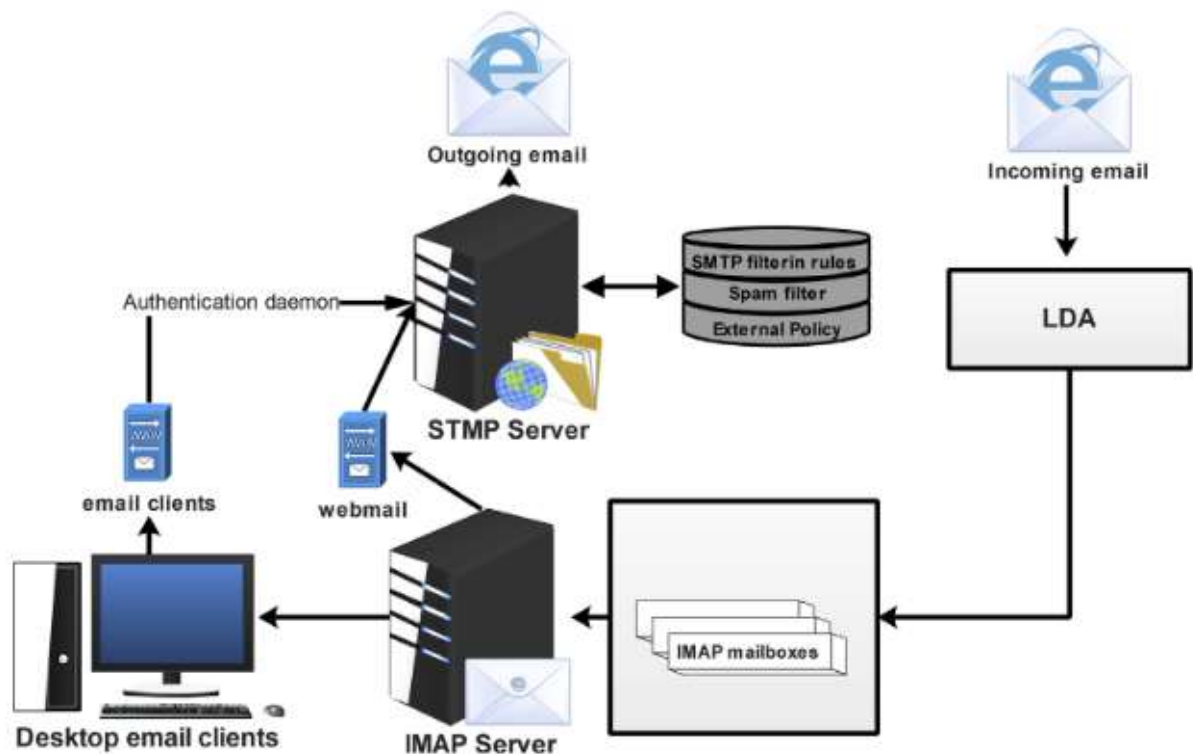
Fig. 1: Spam filtering architecture for email servers.
Source: [39]

In the meanwhile, if the administrator doesn't reroute them, having a very high threshold may result in some critical emails getting isolated, [42], [43], [44], [45].

There are two main parts to an email message: the header and the content. The section of the email with the most general information about its contents is the header. The sender, recipient, and topic are all included, [39]. Web pages, audio, video, analog data, files, graphics, and HTML syntax are a few examples. The email header contains information about the sender and destination, as well as a timestamp that shows when the message was transmitted from intermediate servers to the Message Transport Agents (MTAs), which act as an office for mail organization. Typically, the header line begins with "From" and undergoes modifications each time it traverses an intermediary server to transit from one server to another. The user may see the email's path and the time it takes for each server to process it by viewing the headers. Before the classifier can utilize the provided data for filtering, it must first undergo certain processing, [24], [36], [39]. The mail server architecture and spam filtering process are shown in Figure 1.

2.3 Influence of Speech Recognition

Scientists and engineers have been fascinated for decades by the idea of creating a machine that can communicate with humans, especially one that can understand spoken language, [46]. Speech Recognition System (SRS) also referred to as Automatic audio Recognition (ASR) or computer speech recognition, SRS is a computer software that uses an algorithm to translate an audio signal into a string of words, [5], [25]. The potential for it to be a significant means of communication between people and computers is there. Speech technology-enabled apps are now offered for sale for a small but intriguing range of jobs. These technologically advanced computers provide very helpful and valuable services by accurately and consistently reacting to human voices, [47]. Though many significant scientific and technological advancements have been made, we are still far from having a machine that replicates human behavior. These advancements are meant to get us closer to the "Holy Grail" of robots that recognize and interpret spoken speech, [48]. Table 2 lists the speech recognition system (SRS) applications along with their industry, region, and disciplines:

Table 2. Speech recognition system (SRS) applications along with their industry, region, and disciplines:

|	Application
Education sector	Speech-to-text processing, accurate pronunciation of foreign language words. Students with disabilities may type text vocally using a keyboard.
Medical Sector	Automatic wheelchairs, precise surgery, and medical transcription (digital voice-to-text)
Military Sector	Automatic aircraft control, helicopter, training air traffic controller, Automatic ammunition control
Communication Sector	Ringing on the phone and looking for numbers without an operator's help.
General	Use of dictation systems for security needs in very secure locations. To convert data between languages, play video games, and enter data into an ATM [48].
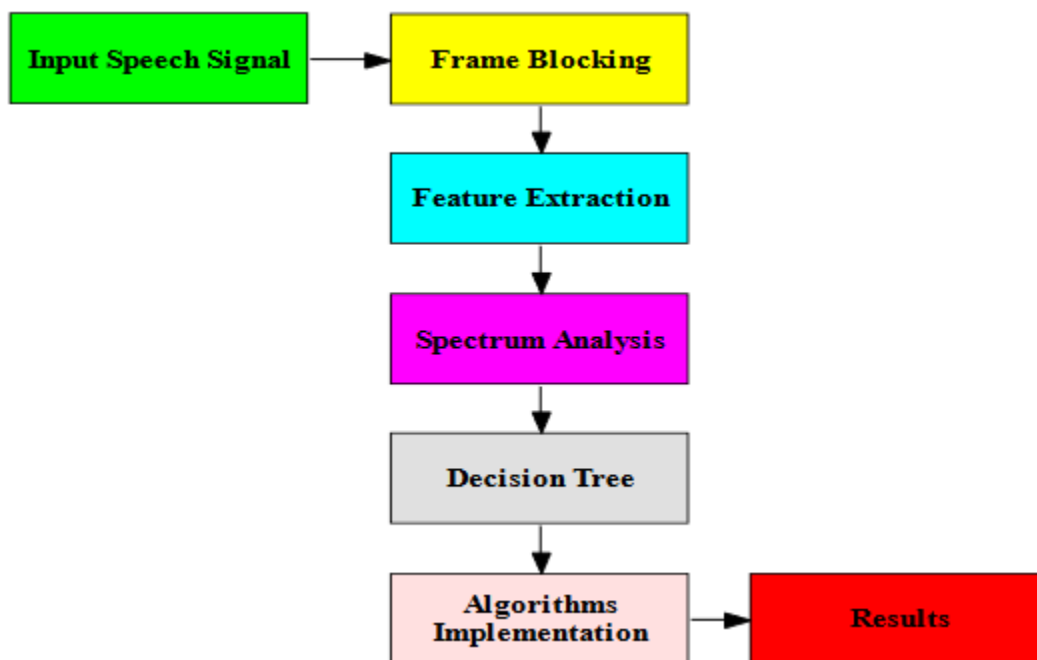
Fig. 2: Speech Recognition System (SRS) general stages

Several speech-processing approaches convert an unknown audio input into a series of feature vectors for use in speech recognition systems. Through the use of algorithms, it transforms feature vectors to phoneme lattice, [47]. A recognition module uses a lexicon to convert the phoneme lattice into a word lattice, and then it applies grammar to the word lattice to identify particular words or text.

The information for the general stages in the speech recognition system (SRS) is shown in Figure 2. There are several processes involved in the voice recognition process. Step 1 is to get signal properties such as total energy and zero crossing strength across different frequency ranges, etc., the spoken signal is separated into evenly spaced blocks in this step, [47].

Each block and phoneme are combined using these attributes' feature vectors to create a string of phonemes. The next step involves a bank of frequency filters, the fast Fourier transform (FFT), and the linear predictive coding approach used to apply spectrum analysis to each block in this phase, [5]. With stage 3, every block undergoes a decision-making process in this stage. The field is narrowed by the distinctive characteristics of each phoneme, [47]. Step 4 involves using various algorithms, this step improves the performance of the decision-making process to achieve a high degree of success. An algorithm is created for every vocabulary word, and a phoneme string is then compared to each algorithm, [25], [36].

2.4   Use of Natural Language Processing (NLP)

The notion of automating language processing was originally explored by linguists and computer scientists in the 1950s which is when natural language processing (NLP) got its start. Earlier attempts were rule-based, analyzing and producing text using manually created language rules, [17]. NLP research was further impacted by Chomsky's invention of transformational grammar theory in the 1960s. But in the 1990s, with the introduction of statistical and machine learning techniques, significant advances were made, [49]. To address language-related challenges, researchers began using methods like probabilistic models and Hidden Markov Models (HMMs). Large annotated corpora like the Penn Treebank made it possible for data-driven techniques to emerge, which completely changed natural language processing, [17].

Natural language processing (NLP) is a technique used by AI chatbots that simulates human interaction by understanding and reacting in natural language, [19]. Natural language processing (NLP) is a language model that is used in chatbot designs to mimic real human speech and enable communication between humans and machines, [17]. Instead of depending only on in-person interactions for communication, modern organizations use natural language processing (NLP) software to develop chatbots that can respond to customer requests, [17]. The combination of NLP and AI has had a tremendous impact on how customers interact and communicate with chatbots on e-commerce platforms, [19]. Fundamentally, NLP serves as a conduit to let users engage and communicate with computers. By evaluating text and adhering to the structure of human language in which words create phrases, phrases form sentences, and sentences express ideas natural language processing (NLP) enables computers to comprehend human language, [24]. NLP has limitations as well and may not be able to do some tasks as well as a human employee. For example, comprehending the complexities and layers of human language, makes it challenging to capture subtleties and essential facts, [33], [50].

Figure 3 explains the most popular apps used by businesses to further their goals and how they are customized for their line of goods. Google Translate is mostly used for smart contracts, virtual help, frequently asked questions, and intelligent communication technologies including audio and video conferencing. These choices facilitate how clients including those with special needs or disabilities interact with the goods of the company, [49].
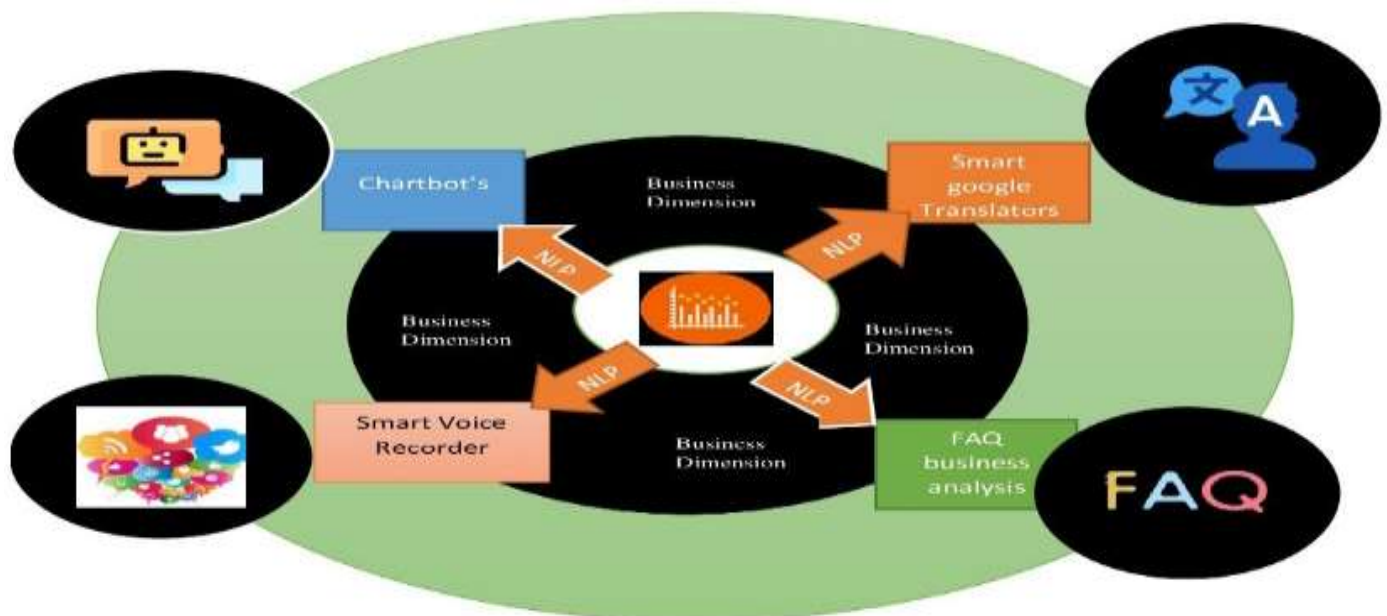

Fig. 3: The most popular apps used by businesses
Source: [49]

The most popular business apps these days are shown in Figure 3. Modern corporate operations are searching for improved choices to delight clients as a result of technological advancements, [26]. The relevance of natural language processing (NLP) rests in its potential to revolutionize human-machine interaction by allowing computers to produce and understand human language at a level previously thought to be science fiction, [44]. NLP has emerged as a key component of many applications in a wide range of sectors, transforming the efficacy and efficiency of a variety of jobs. Natural language processing (NLP) has shown its worth in automating procedures, deriving insights from text data, and opening up new channels of communication, [19]. Examples of its applications range from improving customer service with chatbots to supporting medical diagnosis via language-based analysis, [15], [29].

Natural language is full of contextual ambiguities and complexities that make it challenging for robots to comprehend correctly, [33]. Contextualized word embeddings, attention processes, and transformer models like BERT are noteworthy developments in addressing this issue, [51]. However, there's still room for improvement in terms of handling complex linguistic ideas like sarcasm, irony, and metaphors. Advances are being explored via enhanced contextual representation and contextual reasoning systems. The capacity of NLP to handle a range of communication formats helps to determine its future, [24]. Multimodal natural language processing (NLP) aims to create machines that can understand and generate content that seamlessly combines many modalities. This includes multimodal pretraining, cross-modal attention processes, and joint embedding spaces for several modalities. Applications include interactive chatbots that have a deeper comprehension of user input, picture captioning, and video summarization, [35].

2.5 Challenges and Business Specificities in Implementing AI

Businesses looking to improve customer interactions, reduce processes, and get a competitive advantage may find that integrating AI technologies into business systems is a potential option, [11]. But despite the seeming high failure rate of AI initiatives in many sectors, this undertaking is by no means easy. Prior research has mostly examined the difficulties businesses encounter when deploying AI generally, [4]. To fully realize AI's potential, some prerequisites must be met, including the need for access to large, high-quality datasets and the necessary technology infrastructure for data processing [48].In contrast to stand-alone AI solutions, AI for business requires a seamless connection with databases and platforms already in place, [11]. It also often entails complicated data environments and little disturbance. Furthermore, business necessitates close attention to requirements for scalability and customization, [36].

Determining explicit goals for AI algorithms becomes more important as AI systems become self-sufficient, [52]. However, a major obstacle is that the field of CRM often contains implicit and difficult-to-quantify objectives, [14]. The lack of domain expert supervision, the difficulty in comprehending AI algorithms, and the intrinsic complexity of AI decision-making all contribute to this challenging environment, [53]. Furthermore, in the CRM domain, tight coordination between marketing and sales teams is necessary artificial intelligence (AI) needs to act as a catalyst for bringing these two departments together by offering insights and suggestions that efficiently connect their activities, [51]. AI systems must be able to detect and react to emotional indicators during customer interactions as CRM puts a high value on comprehending the feelings and emotions of its customers. This emotional component gives AI models an additional level of complexity which distinguishes CRM from more basic applications, [24].

A prevalent issue that many businesses have when using AI is a reluctance to change, [54]. Businesses often require tight cooperation between AI and human agents (sales, customer service), therefore striking a balance between their respective roles and duties in these exchanges may call for a special strategy. These unique obstacles must be acknowledged and overcome to successfully integrate AI into business systems, [46] The context of AI-powered CRM poses unique problems that may vary dramatically from those experienced in more general AI adoption or marketing AI adoption situations, making this absence more important, [24]. Business has special problems compared to other settings because of its distinctive features, which include a concentrated focus on customer interactions, a complex data environment, planning needs, emotional concerns, and ethical duties, [36]. These unique problems must be acknowledged and

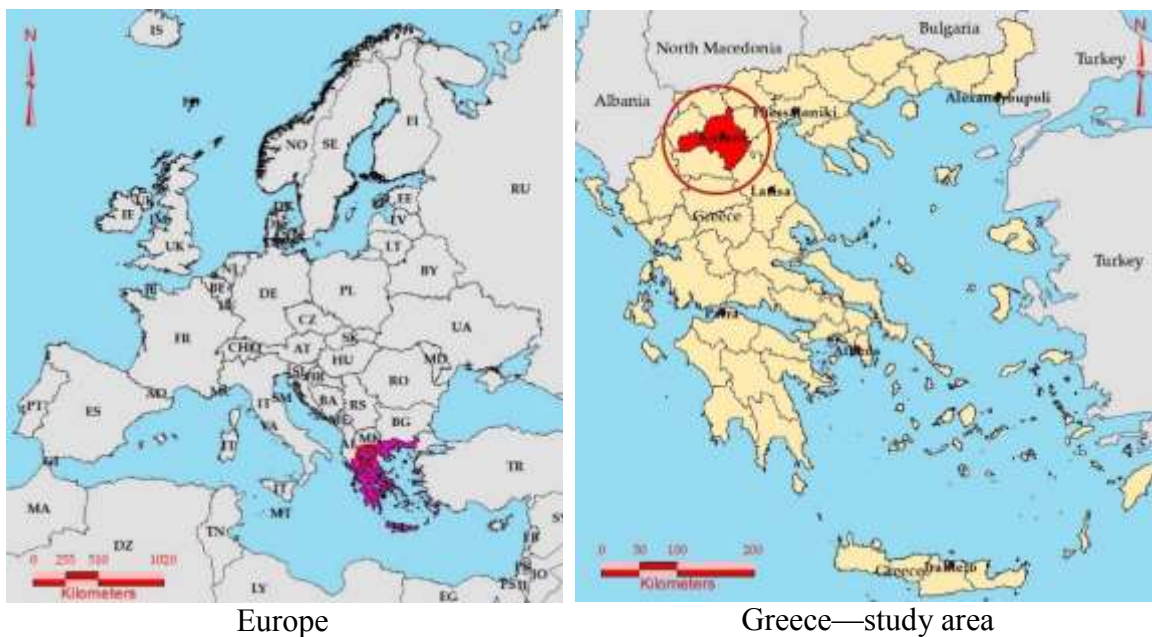addressed to successfully integrate AI into business systems, [6].

| Europe | Greece—study area |

Fig. 4: Maps of Europe and Greece

3 Methodology

3.1 Research Design

The study was quantitative and it made use of the cross-section research methodology. The study design made it easier to gather and analyze quantitative data to describe particular phenomena using the most recent patterns, incidences, and connections between various variables. The cross-sectional survey research technique, which offered data on the study's topic, allowed the researcher to effectively generalize the numerous study results to a larger community of business and technology specialists in Greece.

3.2 Target Population, Sample Size and Sampling Technique

The research focused on various business and technology experts in Greece as its target demographic, since it is thought that they have superior expertise in the integration of artificial intelligence in commercial communication channels (Figure 4). The population served as the foundation for selecting the study's ideal sample. As a result, from a research population of 10,000 distinct government officials across Greece, a sample size of 384 different business and technology experts was chosen. Equation 1 is [55] formula, which was used to determine the sample size.

$$n = \frac{N}{1 + Ne^2} \qquad (1)$$

Calculation of the minimum sample of respondents

where:
n = is the sample size,
N = the population,
e = the level of significance, and 1 is the constant.
Using a 5% (0.05) level of significance

$$n = \frac{10,000}{1 + 10,000 \, (0.0025)^2} \Leftrightarrow n = 384$$

$$n = 384$$

Probability sampling techniques namely stratified and basic random sample procedures, were used in this investigation. In this instance, stratified sampling was used to generate the goal sample, then stratified random sampling was used to extract the final sample from the strata. By using stratification, the researcher separated the participants into groups known as strata according to common attributes. Following division,

a different probability sampling technique, simple random sampling in this case is used to randomly sample each subgroup. Because the leadership population was varied, stratified sampling was crucial to the study's success. Without it, a random sample would not have produced particularly accurate. The benefit of using simple random sampling is that it produces samples that are fairly representative of the community.

3.3 Data Collection
The researcher used an online survey to gather information from Greece's business and technology specialists. One of the easiest and most often used ways to get data is via a survey. This is because it quickly covers a huge number of respondents, is less costly, and enables respondents to freely answer challenging questions without worrying about being accepted or rejected by the researcher. To get the most relevant data for assessing the difficulties and prospects of integrating artificial intelligence in business communication channels, an online survey questionnaire was used. To measure each independent variable for this study, well-crafted statements based on the various indicators of each independent variable as derived from the literature were used, and respondents were asked to indicate whether they strongly agreed, disagreed, or were not sure. Conversely, a nominal scale was used to generate and assess very detailed statements about the benefits and problems of integrating artificial intelligence into business communication channels to quantify the dependent variable. Among the options for Artificial Intelligence in Business Communication that were provided, respondents in this instance could simply choose the best option. In general, the research focused on four main independent variable aspects: the use of virtual assistants and chatbots; the advantages of email filtering; the impact of speech recognition; and the use of natural language processing (NLP). Every independent variable was evaluated using tightly worded sentences, and the answers were recorded on a 5-point Likert scale. First, there was Strongly Disagree (SD), followed by Disagree (D), Not Sure (#3), Agree (A) (#4), and Strongly Disagree (SD) (5). A statement measurement on a likert scale of 1 to 5 was selected for each variable, and it was cross-tabulated with the various SDG characteristics. This would subsequently assist in illuminating the relationship between a certain independent variable and the dependent variable.

3.4 Data Analysis
In addition, SPSS was used for analysis once the quantitative data gathered from the chosen research participants was coded. Frequencies and percentages were used to analyze the data, which were shown in tables. To find out how much artificial intelligence contributes to the efficacy of business communication, regression analysis was also used. Equation 2 of a multiple regression model was used in this instance to determine the different anticipated values.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \qquad (2)$$

where:
Y	represents effective business communication,
β_0	is the constant coefficient of intercept,
X_1	Represents the uses of chatbots and Virtual Assistants,
X_1	Represents the benefits of Email Filtering,
X_2	Represents the influence of Speech Recognition,
X_3	Represents the uses of Natural Language Processing (NLP), and
ε	Represents the error term in the multiple regression model.

The hypothesis of the study was tested and the mode of accepting or rejecting the stated hypothesis was performed at a 0.05 level of significance.

In terms of ethics, the researcher obtained informed permission from the respondents to make sure they were willing to participate in the study. Furthermore, the data of the responders was handled with confidentiality, privacy, and personal integrity. It was simpler to get thorough answers to certain issues since respondents were free to interpret the various opinion questions to answer them.

4 Results
This section presents the results obtained after analyzing data collected from the selected respondents.

4.1 Demographic Characteristics
The results in Table 3 show that the largest portion of respondents (71.6%) was male, while females

accounted for 28.4% (109 out of 384). This disparity highlights a gender imbalance within the technology expert group, reflecting broader trends in the technology sector where men often outnumber women.

Table 3. Showing participants' demographic information (technology experts)

	Characteristic	Frequency	Percentage (%)
Gender	Male	275	71.6
	Female	109	28.4
Age bracket	Below 30 years	68	17.7
	30-40 years	218	56.8
	41-50 years	75	19.5
	50 years and above	23	6.0
Years spent in the technology sector	Below 10 years	35	9.1
	10-20years	281	73.2
	20 years and above	68	11.7
	Total	384	100

Source: Primary data (2024)

Regarding age, the majority of participants fall within the 30-40 years age bracket, making up 56.8% (218 out of 384) of the sample. This is followed by those in the 41-50 years age bracket, representing 19.5% (75 out of 384), and those below 30 years at 17.7% (68 out of 384). Participants aged 50 years and above constitute the smallest group, at 6.0% (23 out of 384). The experience level in the technology sector is heavily weighted towards those with 10-20 years of experience, who account for 73.2% (281 out of 384) of participants. This is a significant majority, indicating that most participants have a substantial depth of experience in the field. Those with less than 10 years of experience make up a small fraction at 9.1% (35 out of 384), and those with more than 20 years of experience represent 11.7% (68 out of 384). The predominance of individuals with 10-20 years of experience underscores the involvement of seasoned professionals in the study, which could influence the insights and perspectives gathered, particularly regarding the integration of AI in business communication.

4.2 Descriptive Results

Table 4 presents results concerning the use of chatbots and virtual assistants in enhancing communication within businesses.

The majority (58.5%) of respondents agree that chatbots and virtual assistants significantly reduce response times for customer inquiries. This indicates a widespread acknowledgment of the efficiency gains associated with automation in handling customer queries, likely driven by the ability of these AI systems to handle multiple inquiries simultaneously. An overwhelming majority (79.2%) to agree that the use of chatbots leads to a more personalized experience for customers. A significant portion (55.8%) agrees that virtual assistants are capable of handling complex customer service tasks as effectively as human agents. However, a substantial percentage (23.4%) still disagrees, indicating some skepticism regarding the ability of AI to handle nuanced or highly specialized customer inquiries. The majority of respondents (72.7%) agree that implementing chatbots improves the efficiency of business communication internally. A considerable majority (74.0%) agree that chatbots and virtual assistants often misunderstand or misinterpret customer queries. While a majority (61.0%) agree that the presence of virtual assistants makes customers feel more engaged with the brand, a notable percentage (16.9%) remains neutral. A significant majority (62.3%) agree that relying on chatbots can lead to a decrease in human employment in customer service roles. This reflects concerns about the potential displacement of human workers by automation, highlighting the need for organizations to consider the ethical and social implications of AI integration in the workforce.

Table 4. Use of Chatbots and Virtual Assistants in Enhancing Communication in Businesses

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Chatbots and virtual assistants significantly reduce response times for customer inquiries.	0.0	6.5	23.4	58.5	11.7
The use of chatbots leads to a more personalized experience for customers	2.6	6.5	11.7	79.2	0.0
Virtual assistants are capable of handling complex customer service tasks as effectively as human agents.	0.0	23.4	5.2	15.6	55.8
Implementing chatbots improves the efficiency of business communication internally	1.3	2.6	11.7	72.7	11.7
Chatbots and virtual assistants often misunderstand or misinterpret customer queries	0.0	2.6	11.7	74.0	11.7
The presence of virtual assistants makes customers feel more engaged with the brand	3.9	6.5	11.7	61.0	16.9
Relying on chatbots can lead to a decrease in human employment in customer service roles.	2.6	1.3	13.0	62.3	20.8

Source: Primary data (2024)

Table 5. Benefits of email filtering towards effective business communication

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
email filtering dramatically lowers the amount of spam and irrelevant emails received	1.3	7.8	11.7	62.3	16.9
email filtering powered by AI enhances the prioritization of crucial messages	2.6	11.7	9.1	64.9	11.9
Email filtering technologies might occasionally misclassify crucial communications	7.8	7.7	2.1	70.8	11.7
AI-based email filtering saves time for employees, allowing them to focus on more critical tasks	9.1	9.9	2.1	47.3	31.7
The integration of AI in email systems enhances data security and privacy	0.0	18.2	15.6	49.4	16.9
AI email filtering systems are easy to implement and integrate with existing email platforms	5.2	14.7	4.5	58.3	17.4
Dependence on email filtering can reduce the ability of employees to manually manage and organize their inboxes	0.0	8.2	5.6	29.4	56.9

Source: Primary data (2024)

The study also identified the benefits of email filtering integration business communication channels and results are presented in Table 5.

The majority of the respondents (62.3%) agreed that email filtering dramatically lowers the amount of spam and irrelevant emails received, demonstrating the usefulness of AI in helping organizations deal with the issue of email overload. This is in line with the hypothesis that AI algorithms would be able to quickly and precisely recognize and separate undesirable messages, optimizing communication routes and raising productivity. There is strong agreement (64.9%) that email filtering powered by AI enhances the prioritization of crucial messages. A sizable majority (70.8%) concur that these technologies might occasionally misclassify crucial communications thereby creating concerns about false positives and the possibility that crucial material will be missed. This emphasizes how crucial human monitoring and ongoing improvement are to reducing algorithmic mistakes and guaranteeing the dependability of email filtering systems.

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Table 6. Influence of Speech Recognition in Effective Business Communication

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Speech recognition technology significantly enhances the accessibility of business communications.	0.0	1.6	9.9	76.9	11.8
The accuracy of speech recognition software is sufficient for professional business communication.	0.0	37.7	1.9	21.8	38.7
Speech recognition technology can effectively transcribe meetings and conferences in real time.	3.1	9.9	2.1	27.9	51.7
The use of speech recognition supports multilingual business communication.	5.2	18.2	15.6	44.2	16.9
Speech recognition technologies sometimes misunderstand accents or dialects, leading to communication errors.	3.9	36.4	18.2	29.9	11.7
Implementing speech recognition technology is cost-effective for businesses in the long run.	7.8	4.7	6.2	71.7	9.7
Reliance on speech recognition may discourage the development of typing and writing skills.	9.1	3.4	9.2	67.8	10.6

Source: Primary data (2024)

Furthermore, although there is recognition of the time-saving benefits (31.7%) and improved data security (44.2%) of AI-driven filtering, there are still obstacles identified.

Regarding the effects on employees' ability to properly manage their inboxes manually (25%) and the simplicity of implementation (22.1%) for example a significant portion of respondents express indifference or disagreement.

The Table 6 presents result on the influence of speech recognition technology on various aspects of business communication.

The majority of respondents agree that speech recognition significantly enhances the accessibility of business communications (76.9%). A sizable portion (38.7%) strongly agree that the accuracy is sufficient. This suggests a level of doubt or even past encounters with errors that have impacted opinions about the accuracy of the technology in work-related settings. Furthermore, there is broad consensus regarding the efficacy of speech recognition technology in real-time conference and meeting transcription (51.7% strongly agreeing and 27.9% agreeing) highlighting the technology's potential to improve and expedite collaborative communication processes in the business world. The fact that a sizable percentage of respondents (36.4%) disagree with the assertion suggests that speech recognition systems as they exist now have difficulties when it comes to correctly comprehending a wide range of linguistic nuances. There is broad agreement among respondents (71.7% agreeing and 9.7% strongly agreeing) that voice recognition technology

implementation is a cost-effective investment for enterprises over the long term. This implies an understanding of the possible cost and efficiency savings linked to implementing such technology. Finally, there is a worry expressed over the possible harm that depending too much on speech recognition could have to the growth of one's typing and writing abilities. Although this statement is agreed with by most respondents (67.8%), it's important to note that a significant number (9.1%) strongly disagree. This demonstrates differences in beliefs about the wider effects of technology on the improvement of communication skills.

The study further examined the different uses of NLP in business communication channels and the results are presented in Table 7.

The majority of respondents (69.6%) either agreed or strongly agreed that NLP significantly improves the understanding of customer feedback and inquiries. The overwhelming majority of the respondents (70%) said that the employment of NLP in business communication results in the right and timely responses. The result was that more than 80% (86.6%) of the parties agreed or strongly agreed that NLP technology is capable of analyzing the sentiment in customer communications. A significant part (77.9%) of respondents (77.9%) saw that the implementation of NLP decreases the need for human interaction in routine messages. This shows that NLP is increasingly used to perform repetitive tasks and release the human resources for complex and strategic positions. It's noteworthy that while a significant percentage (94.8%) agreed or strongly

agreed that NLP technologies are susceptible to context and nuance errors, a fair percentage (5.1%) disagreed or strongly disagreed. The greatest part of the participants who were 69.8% rated integrating NLP with the existing communication platforms as being simple and easy. This demonstrates that NLP could be implemented into current business structures with minimal inking. It is also worth mentioning that a minority (9%) disagreed or strongly disagreed while the majority of the participants (94.8%) agreed or strongly agreed that overdependence on NLP could result in losing personal contact in customer service roles. This implies that the authors have different views relating to individualized customer service interactions, and the efficiency gains through automation. The results concerning opportunities and challenges associated with integrating artificial intelligence (AI) into business communication channels are presented in Table 8.

Table 7. Use of Natural Language Processing (NLP) in Enhancing Communication in Businesses

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
NLP significantly improves the understanding of customer feedback and inquiries.	0.0	7.8	22.1	58.4	11.7
The use of NLP in business communication leads to more accurate and timely responses.	2.6	15.6	10.4	48.1	23.4
NLP technology can effectively analyze sentiment in customer communications.	5.8	5.2	24.7	2.6	61.7
The implementation of NLP reduces the need for human intervention in routine communications.	1.3	7.8	13.0	66.2	11.7
NLP technologies are prone to errors in understanding context and nuance.	0.0	1.3	3.9	51.9	42.9
Integrating NLP with existing communication systems is straightforward and seamless.	0.0	6.5	23.7	50.6	19.2
Overreliance on NLP could diminish the personal touch in customer service communications.	9.0	0.0	5.2	52.9	41.9

Source: Primary data (2024)

Table 8. Results on challenges associated with the integration of artificial intelligence in business communication channels

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
The cost of implementing AI in communication channels is prohibitively high for many businesses.	0.0	0.0	2.9	78.4	18.7
AI technologies in communication can lead to a loss of personal touch in customer interactions.	0.0	5.6	9.4	59.7	25.4
There are significant privacy and security concerns with the use of AI in business communications.	5.8	45.2	4.7	32.6	11.7
AI tools in communication often require extensive training data, which can be difficult to obtain.	0.0	7.8	3.0	76.2	15.7
The integration of AI can lead to a significant reduction in employment opportunities in the communication sector	0.0	1.3	3.9	51.9	42.9
AI technologies are not yet advanced enough to handle all nuances of human communication.	0.0	46.5	23.7	10.6	19.2
The maintenance and updating of AI communication tools can be challenging and resource-intensive.	0.0	0.0	5.2	52.9	50.9

Source: Primary data (2024)

As shown in Table 8, almost three-quarters (78.4%) of the participants think that the costs of applying AI in communication channels are so high that most businesses cannot afford it. An overwhelming majority (59.7%) of people believe

Respondents show concerns about the requirement of abundant training data for AI models with 76.2% agreeing that AI tools in communication mostly demand extensive training data, which might be hard to find.

It is also worth mentioning concerns of possible job cuts, where 51.9% of respondents agreed that AI technological integration can result in significant unemployment in the communication sector. Moreover, even though AI technologies are expanding at an accelerating pace there is still a doubt that they can comprehend all human subtleties. communication as indicated by 46.5% of respondents who disagreed that AI technologies are advanced enough. The maintenance and updating of AI communication tools are perceived as challenging and resource-intensive, with 52.9% agreeing that the maintenance and updating of AI communication tools can be challenging and resource-intensive.

The results regarding the different outcomes relating to effective business communication are presented in Figure 5.

The majority of respondents (25.8%) highlighted the enhancement of internal communication as the most significant outcome resulting from the

that customer interactions involving AI technologies will result in a lack of personal touch. On the other hand, privacy and security concerns are linked to AI's usage in business communications, with 32.6% of the respondents stating they have such concerns. integration of artificial intelligence (AI) in business communication channels. 21.6% of respondents indicated that AI integration led to improved efficiency in business communication. Enhanced customer service emerged as another significant outcome, with 17.4% of respondents acknowledging its importance. Improved data-driven insights, cited by 13.6% of respondents signify the valuable role AI plays in extracting actionable intelligence from communication data. Better automated responses, noted by 7.5% of respondents, highlight the efficiency gains achieved through AI-driven automation. By implementing AI-powered response systems, businesses can handle a higher volume of inquiries and requests with minimal human intervention, ensuring faster response times and improved customer satisfaction. Improved real-time assistance, identified by 9.5% of respondents, underscores the importance of AI-driven solutions in providing timely support and guidance to customers and employees alike. The last portion of respondents (4.6%) noted other additional benefits, including reduced errors, cost savings, and sentiment analysis.
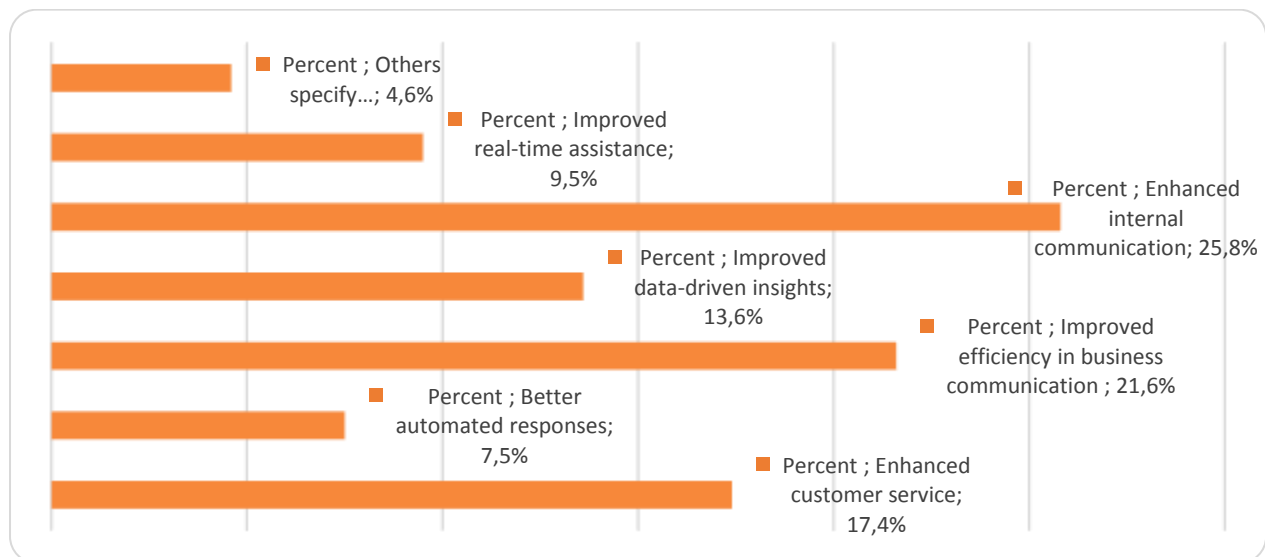

Fig. 5: Results on the outcomes relating to effective business communication
Source: Primary data (2024)

4.3 Regression Analysis

The efficacy of the integration of artificial intelligence in business communication channels was established using regression analysis as presented in the subsequent tables.

The dependent variable is effective business communication. As shown in Table 9, regressing the independent and dependent variables results in an R2 value of 0.686. This demonstrates that 68.6% of the variation in the dependent variable (effective business communication) can be attributed to the independent variables. Furthermore, the results of the regression analysis demonstrated that 31.4% of the changes were unaffected by any of the study's independent variables.

Table 10 shows that there is a significant linear relationship between the dependent variable (effective business communication) and the independent variables (use of chatbots and virtual assistants, benefits of email filtering, influence of speech recognition, and use of natural language processing (NLP), as indicated by the F-statistic of 71.421 at prob. (Sig) = 0.014 conducted at 5% level of significance.

As shown in Table 11, the regression coefficients helped to determine the impact of various artificial intelligence (AI) technologies on effective business communication. The unstandardized coefficient (B) is 0.238, indicating that, holding all other variables constant, the use of chatbots and virtual assistants is associated with a 0.238 unit increase in effective business communication. The high standardized coefficient (Beta = 0.371) and significant t-value (1.124) with a p-value of 0.000 strongly suggest that chatbots and virtual assistants have a positive and significant impact on enhancing business communication. This result supports Hypothesis One (H1), suggesting that chatbots and virtual assistants are valuable in improving communication in business contexts. With an unstandardized coefficient of 0.124 and a standardized coefficient of 0.062, email filtering is associated with a slight increase in the effectiveness of business communication. The t-value of 0.507 and a significance level of 0.001 indicate a positive impact, albeit smaller than that of chatbots and virtual assistants. This finding supports Hypothesis Two (H2), affirming the positive role of email filtering in enhancing business communication. The coefficient for speech recognition is 0.106 with a standardized beta of 0.051, suggesting a moderate positive influence on effective business communication. The t-value of 0.817 and a significance level of 0.012 indicate a statistically significant effect, which supports Hypothesis Three (H3). This result underscores the importance of speech recognition technology in improving business communication. Uses of Natural Language Processing shows a B coefficient of 0.166 and a Beta of 0.082, with a t-value of 0.411 and a significance level of 0.002. These figures suggest that NLP has a significant positive effect on business communication, supporting Hypothesis Four (H4). NLP technologies contribute to enhancing communication effectiveness within business environments.

Table 9. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.698	0.686	0.654	0.10214

Predictors: (Constant): Use of chatbots and Virtual Assistants, Benefits of Email Filtering, Influence of Speech Recognition, Use of Natural Language Processing (NLP)

Table 10. ANOVA analysis

Model	Sum of Squares	Df.	Mean Square	F	Sig.
Regression	76.204	3	28.031	73.261	0.014
Residual	71.051	380	0.413		
Total	147.255	382			

Dependent variable: Effective Business communication, Predictors: (Constant): Use of chatbots and Virtual Assistants, Benefits of Email Filtering, Influence of Speech Recognition, Use of Natural Language Processing (NLP).

Table 11. Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.588	0.126		1.941	0.007
Use of chatbots and Virtual Assistants	0.238	0.054	0.371	1.124	0.000
Benefits of Email Filtering	0.124	0.062	0.062	0.507	0.001
Influence of Speech Recognition	0.106	0.081	0.051	0.817	0.012
Uses of Natural Language Processing (NLP)	0.166	0.046	0.082	0.411	0.002

Dependent Variable: Effective Business Communication.

5 Discussion

This study examined the different opportunities and challenges associated with the integration of artificial intelligence in business communication channels. The findings showed that AI tools such as chatbots have a significant effect on the effectiveness of business communication. A chatbot is a computer program designed to conduct textual or sound-based conversations. A chatbot is often employed in customer care or data security. Chatbots help discover that placing an online order at a business is much quicker than picking a few buttons, putting the item in the basket, and then finishing the transaction, [17]. While some systems look for keywords from the inputs and then react from the database with the appropriate keywords, other chatbots utilize the rendering system for natural language. The results show that businesses that have adopted chatbots have a great advantage since they will be crucial for all organizations in the future. Bots are economical and capable of responding and interacting with several people at once, [4], [9]. Machine learning bots are much more intelligent and they help in enhancing the effectiveness of communication between customers and business owners, [3], [6], [19]. It is important to note that business executives may design or choose effective chatbot solutions based on the connections this research validates, [20]. According to [8], companies have the opportunity to enhance their customer service performance, therefore increasing their sustainability and yielding several long-term advantages. For instance, businesses might choose chatbots that generate internal agility by automatically responding to consumer inquiries, addressing customer issues, and recognizing customer preferences to enhance customer experience and satisfaction, [17]. Companies might use chatbots that generate external agility with data analysis to spot shifts in consumer demand and the market to better service customers and stay competitive, [26], [56]. Chatbots and virtual assistants embody a major progress in business communication. These intelligence-driven tools allow users to interact with customers in a real-time and efficient manner. Such AI-based tools can handle multiple queries at a time without compromising the quality of service. This feature of the AI technology is in line with the outcome of study [1], which emphasized efficiency improvement due to automation in customer service. The personalized customer interaction capability endowed on chatbots makes them even more vital in building satisfaction and loyalty, a very critical competitive edge in today's market. In addition, the use of machine learning algorithms for chatbots enables their ability to learn from their interactions leading to more accurate and relevant responses, [3]. This dynamic adaptability emphasizes the transformative nature of chatbots in reshaping the connections between business and communication.

The findings show that NLP is essential to AI-powered business communication because it makes it possible for robots to comprehend and produce human language, [6], [11], [15]. In customer support, voice-based interactions are becoming more and more common, [57]. The emergence of voice-based customer support interactions is a significant turning point. Voice recognition technology makes it possible for chatbots and virtual assistants to comprehend spoken language and reply accordingly, resulting in a more intuitive and natural user experience, [3], [5], [19]. AI's useful uses are constantly growing, proving how flexible and adaptable it is in a variety of settings, [9]. Since the regulatory environment around AI changes all the time companies have to keep aware of what they need to do to comply, [8]. The future seems

promising for the dynamic and revolutionary integration of AI into corporate operations. Businesses will need to find a balance between realizing the promise of artificial intelligence (AI) and guaranteeing its ethical and responsible use [3]. Natural Language Processing (NLP) forms the backbone of AI's effect on business communication, allowing computers to comprehend and generate human language comprehensively and concerning the context. This technology not only automates routine communications and improves the efficiency of customer service but also analyses the sentiment and understands the subtleties of customer feedback, [4]. The development of NLP technologies, especially in sentiment analysis, helps organizations understand the preferences and sentiments of their customers, thus permitting them to establish communication strategies that line up perfectly with the intended audiences, [5] of despite the complexities of understanding context and the nuances in NLP, it is projected that AI will develop to the point where it will be delivering even higher and more sophisticated levels of business communication.

Examining the possible opportunities and difficulties of the digital transition and the incorporation of AI systems into future work practices is becoming more and more necessary, [5], [14]. The use of AI in the workplace has the potential to have of several effects on human behavior, including the establishment of new morals, ethical standards, and values as well as the learning and prediction of human behavior, [16], [49], [52]. A research study examines the potential issues with AI in the workplace while also offering insights into the changing nature of work in light of the newly identified COVID-19 difficulties, [2], [20]. Past studies contend that key components of a policy agenda and implementation plan for future AI practices in the workplace are explainability, accountability, and digital literacy among all stakeholders and users (decision-makers, employers, and workers), [15], [34], [58]. The management of employees in an organization, for instance, is one use of AI that may have ethical, technological, and societal ramifications in the workplace, [2], [13], [25]. AI systems allow organizations to monitor, coordinate, and make decisions regarding their workforce, including hiring, promoting, assigning tasks, and other matters. To maximize work performance, AI prediction models have been proposed to evaluate the degree of staff competency,

[16], [59]. Using a suggested artificial intelligence model, job knowledge, self-motivation, self-concern, and role perception are utilized to predict work performance as a function of job competence, [60].

The implementation of AI in business interactions can raise ethical and social issues, [61]. AI technologies are increasingly integrated into business models leading to issues of employment, privacy, security, and the loss of that human factor in communication and customer support, [20]. Ethics of AI Management necessarily involves a balanced approach that includes both the pros of efficiency and innovation as well as the possible negative impacts on society and the workforce. To address these difficulties effectively, future AI practices in the workplace should focus on transparency, accountability, and the development of digital literacy among all interested parties.

6 Conclusions

This study focused on establishing the different opportunities and challenges associated with the integration of artificial intelligence in business communication channels. The results demonstrate that creative and professional usage of AI tools has a greater impact on both internal and outward communication in businesses. As per this study, business communication may become effective by integrating sensors, chatbot, email filtering, speech recognition, and NLP into various business processes. As a result, this research provides valuable information regarding ways in which organizations can effectively implement chatbots to gain business advantages. The next stage of the research may involve exploring the nature of other organizational factors that break the correlation between the use of chatbots and their shortcomings. The progress toward natural language processing will permit bots and virtual assistants to have a more creative understanding of complex questions and context. These findings give insight into specific intricacies and difficulties that companies might come across when they use AI in business procedures through the identification of these difficulties. The difficulties in integrating AI might vary based on the particular circumstances of any company. Future developments that are intriguing are shown by the trajectory that virtual assistants and chatbots have taken in customer care for cellular services. It is envisaged that these technologies can be integrated with the Internet of

Things (IoT), enabling smooth communication between gadgets and AI-powered support systems. Another development is improving multilingual capabilities, which makes content more accessible to a wider range of users. This research has significant applications as well. This research demonstrates a relationship between customer service success and chatbot agility, both internal and external. This research gives practitioners a better knowledge of the critical role chatbot-enabled agility plays in enhancing customer service. Companies are substantially investing in the development of AI technologies and entering this new environment as customers spend more time in digital spaces enabled by AI. Therefore, by incorporating chatbots into corporate operations and increasing the effectiveness of business communication, our research may help business executives improve business communication.

6.1 Recommendations

This research has shown that businesses have unique obstacles and difficulties when it comes to using AI. The success of these interventions should be aggressively promoted, notwithstanding the many EU, national, public, and commercial programs that support digitalization and artificial intelligence. This is because businesses are critical to the adoption of AI in the European industry.

It will be crucial to make sure that investment and funding assistance for businesses, in particular, are suitably targeted and successful, as the primary financial impediments to business adoption of AI. Additionally, keeps the Commission must keep assisting businesses in their digital transformation of using its COVID-19 recovery plan. Additionally, the monitoring procedure may be combined with self-assessment AI maturity tools at the start and finish of these programs, allowing businesses to take part in the accelerator initiatives to reap legitimate advantages.

that support the Greek government needs to support initiatives that use AI and other new technologies to strengthen the resilience of Greek supply chains within the framework of global value chains (GVCs). By doing this, supply shocks or the economy may not cause future supply bottlenecks for European industry. AI-powered big data analysis may aid in the early detection of issues. Risks may be decreased by diversifying suppliers and thinking about moving some manufacturing to Europe, made

possible by AI and other cutting-edge technology. If big businesses and multinationals invested in near-shore outsourcing to more locally focused manufacturers, this may assist in strengthening businesses across Greece and Europe.

6.2 Areas for Future Research

Our findings might be expanded in several ways by future research. Initially, research in the future might evaluate our approach using several AI tools to see which kind of tool performs better in other settings, such as human resource management. For example, chatbots designed to help consumers and workers, for instance, are likely to be used in various contexts. Subsequent research endeavors may include conducting field trials to investigate the most effective amalgamation of chatbot usage scenarios and their impact on chatbot agility. Future research can also focus variables that affect the desire to continue using the emerging AI tools on modern businesses.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT in order to improve the readability of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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