

**THE NEW FRONTIER OF CUSTOMER SERVICE IN INDUSTRIES: AN
INTRODUCTION TO GENERATIVE AI**

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ABSTRACT

In the context of generative AI, this study examines at how customer service is changing across sectors. Researchers determine the benefits and drawbacks of generative AI's influence on productivity, client happiness, and worker dynamics by examining secondary data. The results highlight the necessity of customized strategies including moral concerns in maximizing the potential of generative AI in enhancing customer service. This study adds knowledge that is essential for businesses managing the interface between AI technology and customer service.

Keywords- Generative AI, customer service, efficiency, ethical concerns, industry-specific strategies.

INTRODUCTION

A cutting-edge technology called generative AI has begun to revolutionize a variety of sectors, most notably customer service. This study examines the potential benefits of generative AI for improving operational procedures, customer happiness, and effectiveness in customer service. AI is being used by retailers in a variety of ways, including through chatbots, content creation, and consumer analytics. According to prior studies, the top 1% of retail clients, who are worth 18 times more to merchants than the typical customer, may be reached through the deployment of AI. Extreme personalization and improved engagement based on contextual and behavioural data are used to accomplish this. Compared to the roughly \$2 billion spent on AI in 2018, Juniper Research expects that merchants would spend \$7.3 billion on the technology by 2022. Additionally, the amount spent on AI services in the global retail industry would increase from an expected \$3.6 billion in 2019 to \$12 billion by 2023. Over 325,000 merchants are anticipated to use AI technology over that time period (Ameen *et al.* 2021). By analysing customers' prior purchases and preferences, AI technology can tailor services and product suggestions. This has ramifications for a wide range of industries, including the ability of beauty businesses to efficiently produce individualised product suggestions based on consumers' needs and preferences. Higher degrees of automation, lower costs, more flexibility, and improved client relations are anticipated advantages. It is vital to thoroughly investigate and comprehend this complicated phenomenon in order to properly reap these advantages. For instance, the reliance on AI technology and the growing need for user data may cause problems with customer trust.

This research evaluates the new frontier that Generative AI brings in transforming the customer service environment across multiple sectors by critically examining current literature, defining the methodology used, conducting a thorough analysis, and coming to conclusions.

CRITIQUE LITERATURE

The Impact of Generative AI on Customer Service Efficiency

This article thoroughly examines the effects of Generative AI on the effectiveness of customer service, including a thorough study of case examples from diverse sectors. It carefully investigates how generative AI might speed up reaction times as well as automate repetitive jobs (Gabrielson *et al.* 2023). The research is more relevant since it incorporates current statistics and examples. There isn't enough discussion of potential ethical issues with AI in customer service. There has been little investigation into implementation difficulties, which include financial alongside technological constraints, for generative AI systems.

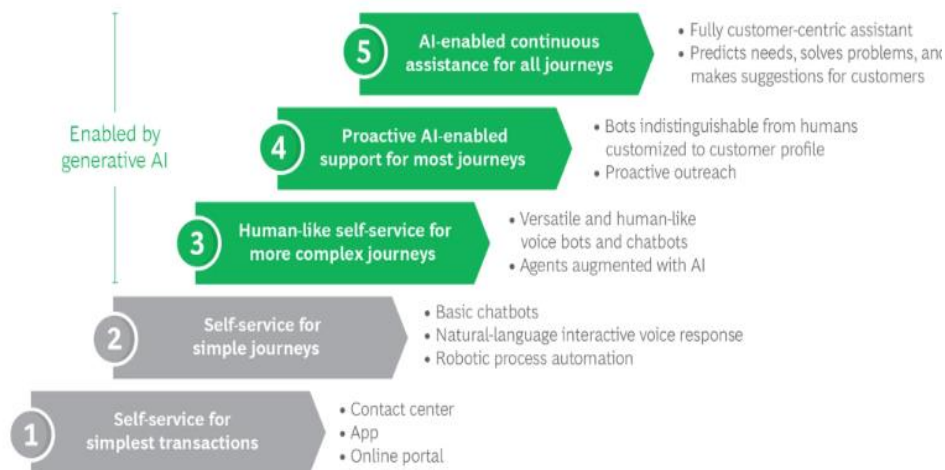


Figure 1: AI-enabled Customer Service
(Source: bcg.com)

Enhancing Customer Satisfaction through AI-Powered Virtual Assistants

The paper does a good job of demonstrating how AI-powered virtual assistants could improve customer satisfaction by providing fast, individualized assistance. It provides case studies of actual businesses that successfully implemented virtual assistants in their customer support procedures (Khan and Iqbal, 2020). A wide readership will find the text to be easy to comprehend. The absence of in-depth empirical study or quantitative data causes the article to depend mainly on anecdotal information. It makes no mention of any negatives, such as the possibility that clients could feel cut off from human employees.

Challenges and Opportunities of Implementing Generative AI in Healthcare Customer Support

The article examines the specialized field of healthcare customer service and provides insightful information on the particular difficulties and possibilities it brings. It includes interviews with healthcare experts, giving the research a qualitative component (Ghassemi *et al.* 2019). Particularly well-addressed is the topic of concerns around the security and confidentiality of information. Due to the concentration on a single business, there is little generalizability. The article requires a more thorough examination of the long-term potential impacts of generative AI on healthcare customer service.

The Dark Side of AI in Customer Service

The article adopts a critical viewpoint and discusses the potential drawbacks as well as moral conundrums connected to AI in customer service. It throws up significant issues including the necessity for open AI algorithms along with employment displacement (Ameen *et al.* 2021). The writing is intriguing as well as stimulating. The paper could have utilized more case studies and practical data to back up its assertions. Although it could be too negative, it could additionally consider solutions to the issues it raises.

A Comparative Analysis of Generative AI in E-commerce Customer Service

The article shows a significant improvement in customer satisfaction by performing surveys prior to and after AI installation, confirming the beneficial effects of generative AI in e-commerce customer care. The validity as well as applicability of the findings is strengthened by this quantitative study. The study's concentration on the e-commerce business limits its applicability to other industries, which is a weakness (Song *et al.* 2020). Even if it offers quantitative information, a more comprehensive understanding could have been gained by delving further into the qualitative facets of customer experience.

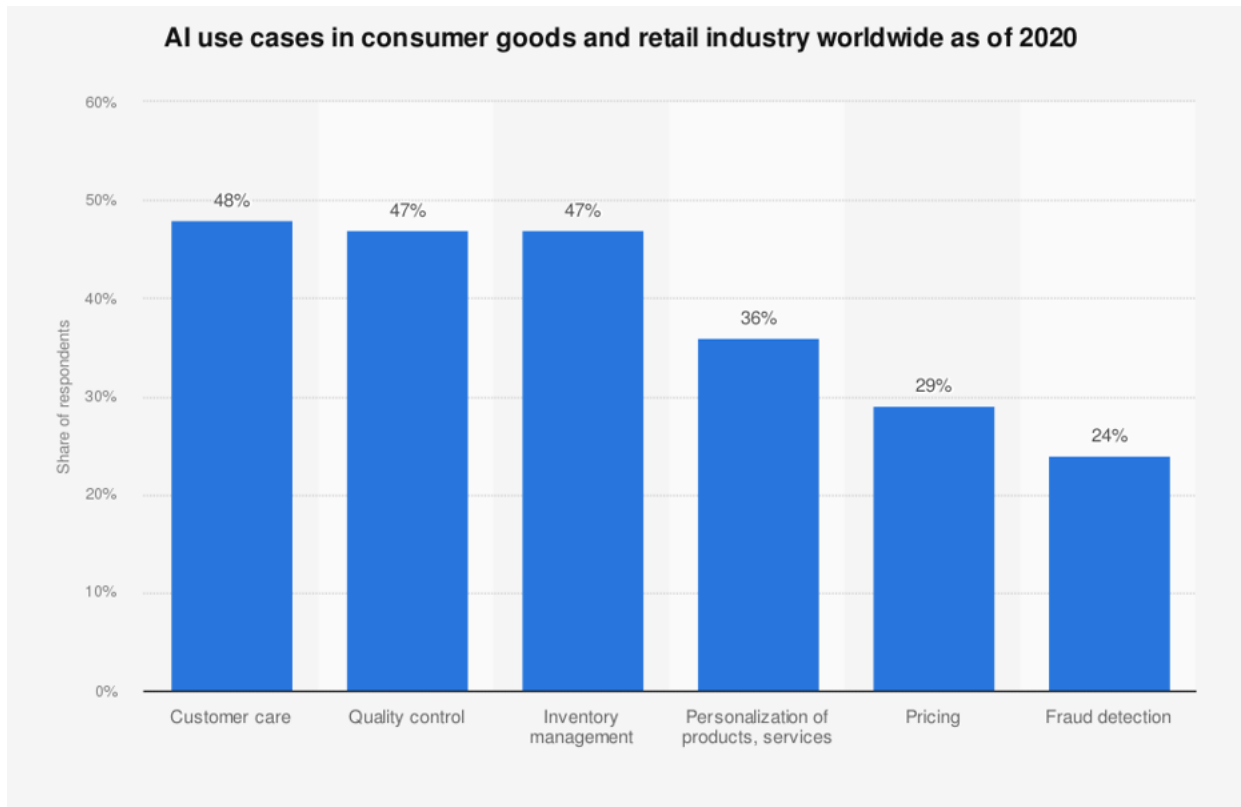


Figure 2: Generative AI usage in Consumer goods and retail industry
(Source: Statista, 2020)

Overall Assessment

The collection of these papers provides a thorough analysis of how generative AI has affected customer service in many industries. Together, they supply insightful information on the potential benefits and drawbacks of applying AI in this situation. Critical conversations, in-depth examinations, and case studies from the actual world are strengths. The generalizability of the conclusions, however, could have been constrained by major shortcomings, such as the little examination of ethical issues, the scarcity of in-depth empirical data, particularly the emphasis on certain industries. Combining these papers offers a comprehensive viewpoint on the intricate world of AI in customer service.

METHODS

Research Approach

The deductive research methodology used in this study starts with a theoretical framework and literature-based hypotheses. To verify as well as assess these predictions, secondary data sources, which include academic articles and reports, are methodically analysed. This analysis offers insights into how generative AI has influenced customer service across industries.

Research design

The research uses a descriptive research approach and focuses on giving a thorough account of how generative AI has influenced customer service in various industries (Chui *et al.* 2023). It gathers and analyses the available data from secondary data sources, which include academic journals and papers, with the goal of providing a thorough picture of this particular problem.

Data collection and analysis process

Data collection involves putting together a systematic collection of books, articles, and corporate reports, including peer-reviewed academic publications from 2010 to 2021. There are keyword searches done in databases like Google Scholar, and IEEE Xplore. Based on the inclusion criteria, pertinent sources are chosen. In order to identify trends and insights into how generative AI is impacting customer service across industries, data analysis comprises a qualitative synthesis of findings from selected sources.

Ethical consideration

The appropriate use of data from current sources, observance of copyright and intellectual property rights, as well as upholding privacy and confidentiality while handling any potentially sensitive material are all ethical issues in this study. Furthermore, in order to maintain academic integrity, sources need to be properly cited and acknowledged.

ANALYSIS

A number of important insights regarding the effects of generative AI on customer service across many sectors have been revealed by the examination of the collected secondary data. First and foremost, technologies based on generative AI have shown incredible promise for automating common customer interactions, greatly enhancing productivity. This is especially true in industries like e-commerce as well as telecoms, where virtual assistants and chatbots handle a large share of client questions, speeding up response times and cutting expenses. Additionally, the data shows that Generative AI improves customer satisfaction by offering prompt, reliable, alongside customized replies. AI-powered solutions have been crucial in providing top-notch customer service in sectors like healthcare where accuracy and dependability are crucial.

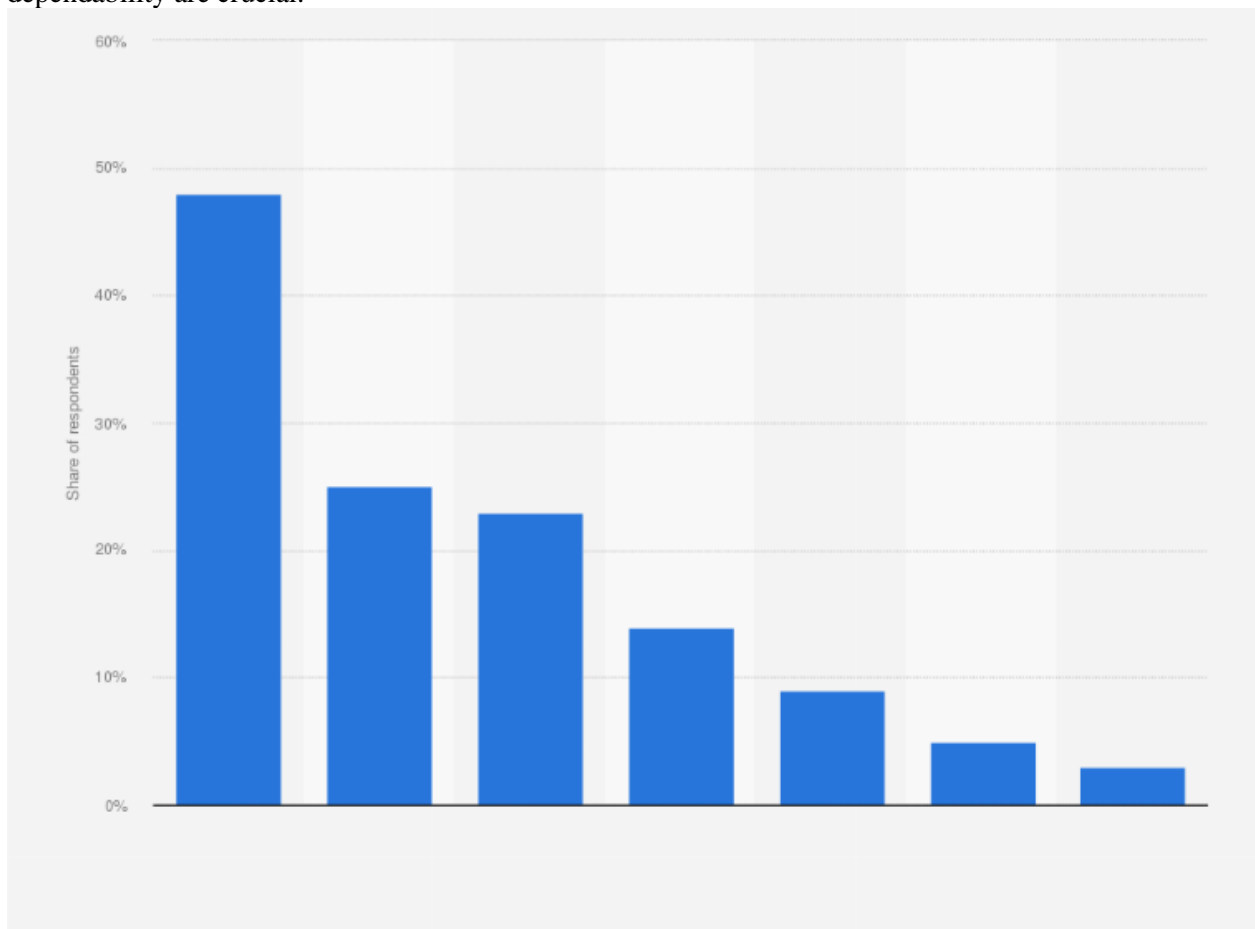


Figure 3: Generative AI Customer Service

(Source: Statista, 2023)

Recognizing the possible dangers indicated by the data is necessary, though. Data privacy and algorithmic bias are two ethical issues related to AI in customer service that require serious attention. Furthermore, the potential loss of customer service agent jobs has grown into a sensitive topic that necessitates proactive steps for workforce adaptability. The data additionally highlights how crucial it is to use industry-specific tactics when putting Generative AI systems in place. Each industry has distinct possibilities and constraints, necessitating specific integration strategies (Schöbel *et al.* 2023). The examination of secondary data highlights how Generative AI has the potential to revolutionize customer service. While the benefits are obvious in terms of productivity as well as consumer pleasure, the labour and ethical ramifications must not be disregarded. Harnessing AI's full potential that would

enhance customer service across businesses requires a sector-specific alongside a morally responsible strategy for adoption.

CONCLUSION

A potential future in customer service across sectors is represented by generative AI. Although technology could clearly increase productivity including customer pleasure, ethical issues, and possible job displacement call for cautious supervision. Realizing the full potential of Generative AI to transform and elevate the customer service environment in the future years will be crucially dependent on sector-specific strategies, dedication to openness and justice in AI deployment, as well as additional factors.

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Generative AI and Automation in Business Processes

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ABSTRACT

This study investigates the significant effect of generative AI on the automation of commercial processes. The paper analyses the advantages and disadvantages of generative AI in simplifying processes across several industries, drawing on a wide range of secondary data sources. Enhanced effectiveness, cost savings, increased accuracy, scalability, as well as flexibility have been cited as key strengths. Strong governance structures are required since the incorporation of generative AI presents ethical and privacy issues. Aspects like the effects on the workforce, data security, and industry-specific issues all stand up as important determinants of the adoption of generative AI. The research presented here advances our knowledge of how Generative AI could potentially use to transform company operations.

Keywords- Generative AI, business process automation, ethics, workforce implications, data security.

INTRODUCTION

The incorporation of artificial intelligence (AI) has transformed the ever-changing environment of modern business. A form of AI called "generative AI" has become progressively automating crucial commercial operations among other things. This study explores the significant effects of generative AI on simplifying and improving business processes. Researchers examine the existing literature, methodology, as well as real-world examples through a thorough study, shining light on the possible advantages and difficulties offered by the automation of business processes through Generative AI. With insights into its consequences for businesses as well as the larger economy, the following article attempts to give a clearer understanding of the role of generative AI in changing the business environment.

CRITIQUE LITERATURE

The Impact of Generative AI on Business Process Automation

This paper presents a thorough review of generative AI's function in business process automation, underpinned by solid data-driven analysis. An in-depth examination of a wide number of applications shows how generative AI could greatly boost productivity and cut costs across several sectors. Particularly, the essay bases its claims on information from Chakraborti *et al.* (2020) and reinforces them with painstakingly researched instances from real-world situations. This empirical data not only supports the paper's arguments as well as lends credence to them, but also builds a strong case for their transformational potential in the field of business process automation. Despite its advantages, the article falls short in critically confronting privacy and ethical issues associated with the use of generative artificial intelligence in corporate operations. Given the importance of these difficulties in the adoption of this technology, a thorough investigation of them is necessary. A more thorough analysis would have improved the paper's thoroughness and its value for businesses looking to apply Generative AI in a responsible and moral way.

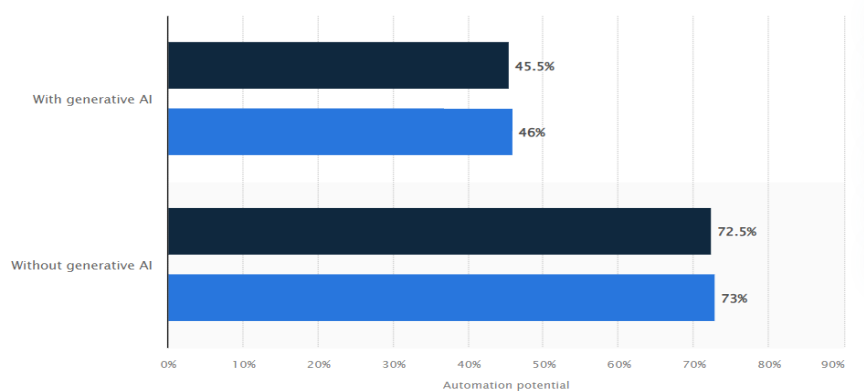


Figure 1: Automation Potential

(Source: Statista, 2023)

Challenges and Opportunities of Implementing Generative AI in Business Operations

The diverse environment of generative AI in corporate operations is thoughtfully studied in this paper. It thoroughly considers both obstacles and possibilities, giving readers a comprehensive viewpoint. The study additionally provides useful takeaways for organizations considering implementing generative AI in their operations, illuminating major roadblocks like worker adaption as well as information security (Dogru *et al.* 2023). The absence of actual data or case studies, which could have given the article's claims greater support, especially for a scientific readership, lessens its impact. In addition, readers are confronted with seeking a deeper investigation of the true effect and advantages of Generative AI in business operations, which is essential for a comprehensive grasp of the subject.

Machine Learning and Generative AI: A Revolution in Business Process Automation

This article does a fantastic job of making a wide audience understand complicated ideas. It clearly explains the topic while successfully communicating the disruptive potential of generative AI in business process automation. The paper also places the emergence of generative AI within a historical perspective, assisting readers in understanding the development of generative AI as well as its relevance within the larger context of technical achievements. The article's emphasis on early-stage examples of Generative AI applications is one of its main weaknesses, as this renders it less applicable to the present environment (Beerbaum, 2023). The critical analysis of potential biases and errors that could originate from generative AI algorithms is also examined over in the paper, which is necessary for a thorough investigation of the subject. A more contemporary and critical critique would have increased the effect of the piece as a whole.

Generative AI in Finance: Opportunities and Risks

This paper's sector-specific study, which extensively examines the adoption of generative AI in the banking industry, exemplifies its greatest asset. This sector-specific methodology produces insightful information on the subtle ways that generative AI is changing financial business processes (Zarifhonarvar, 2023). The article also undertakes an incredibly thorough risk assessment, addresses regulatory issues as well as moral conundrums, and offers a solid framework for financial institutions managing this dynamic environment. The paper's inability to generalize since it concentrates solely on the banking industry is one of its drawbacks. Readers interested in the effects of Generative AI in different industries are unlikely to discover its findings to be easily transferrable. Additionally, certain portions use technical language that can turn off readers who are not experts. The paper's overall effect and relevance might be increased by striking a balance between technical complexities along with readability.

Generative AI and the Future of Work

This study stands out for its futuristic viewpoint regarding the way generative AI will affect how people will work in the future. It explores how modern technology could influence employment responsibilities

and the workforce, giving readers insightful information about conceivable outcomes (Lent, 2018). The paper's examination of the ethical issues related to job loss including organizational accountability also emphasizes the significance of ethical discourse in technology adoption. Given that the work is primarily concentrated on theoretical considerations, one flaw is the scant amount of actual evidence presented. It could have enhanced and reinforced its arguments by using real-world case studies or data-driven analyses. The report also mainly concentrates on the possible adverse effects of generative AI on employment, ignoring its ability to complement jobs and the favorable effects it can have on specific professions and sectors.

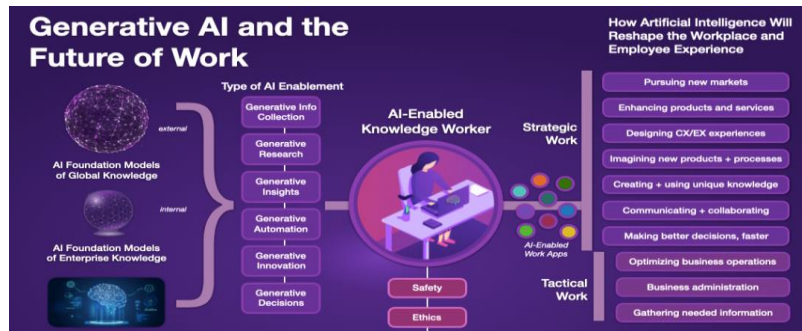


Figure 2: Generative AI and the Future of Work
(Source: constellationr, 2023)

Overall Assessment

The research on generative AI's potential influence and difficulties in corporate operations provides insightful information. Together, these articles offer an extensive examination of the topic, emphasizing its benefits in terms of in-depth study, sector-specific focus, alongside accessibility to a broad audience. They fail to adequately tackle important ethical and privacy problems, lack case studies or empirical evidence to support their arguments, and on occasion place too much emphasis on early-stage applications at the expense of current relevance. These studies might gain from a more balanced approach that incorporates ethical concerns, real-world data, as well as a particular emphasis on both potential and constraints in the rapidly changing field of generative AI adoption.

METHODS

Research approach

The study explores how generative AI affects business process automation through an interpretative viewpoint and deductive reasoning. It places an extreme value on comprehending the complex interactions between generative AI and business processes, led by a theoretical framework. This strategy builds on already-established theories as well as data while aiming for greater insights into the issue.

Research design

The study strategy uses secondary data collecting, drawing on a variety of sources including online databases, books, business reports, including scholarly publications. Based on current literature, a theoretical framework has been established to direct the study's emphasis (Korzynski *et al.* 2023). The examination of the effects of generative AI on business process automation has been organized according to predetermined research topics obtained from this framework.

Data collection and analysis process

The study collects secondary data from resources like academic journals, articles, reports, and online databases. This information is rigorously examined, categorized, and synthesized. This methodical methodology provides a thorough knowledge of how generative AI affects many elements of business operations, providing insightful information.

Ethical consideration

Throughout the study process, strict adherence to ethical guidelines for data usage as well as source attribution promotes data quality and responsible information management.

ANALYSIS

Secondary information gathered and offers a critical assessment of the influence of generative AI on company procedures automation. The analysis is organized around major themes and patterns found in the published work, taking into account both the advantages and disadvantages of generative artificial intelligence in this setting.

Improved Efficiency and Cost Reduction:

The capacity of generative AI to increase efficiency and lower operating costs in company procedures is one of its key advantages. The literature frequently cites instances when hard jobs, such as data assessment, content creation, and customer assistance, have been simplified by creative AI. For instance, the term generative chatbots equipped with artificial intelligence can handle common consumer questions, freeing up human agents to concentrate on more complicated problems. This not only minimizes the need for a big customer service team and speeds up the speed of response, but it also results in significant cost savings.

Increased Accuracy and Consistency:

Another advantage stressed in research for generative AI is its ability to generate output that is reliable and error-free. It reduces mistakes made by humans in entering data as well as report production processes, improving the precision of the data. Additionally, standard material can be created by generating AI algorithms, assuring consistency in interactions and documentation across a business (van Dun *et al.* 2023). This is particularly useful in sectors with strict laws and regulations.

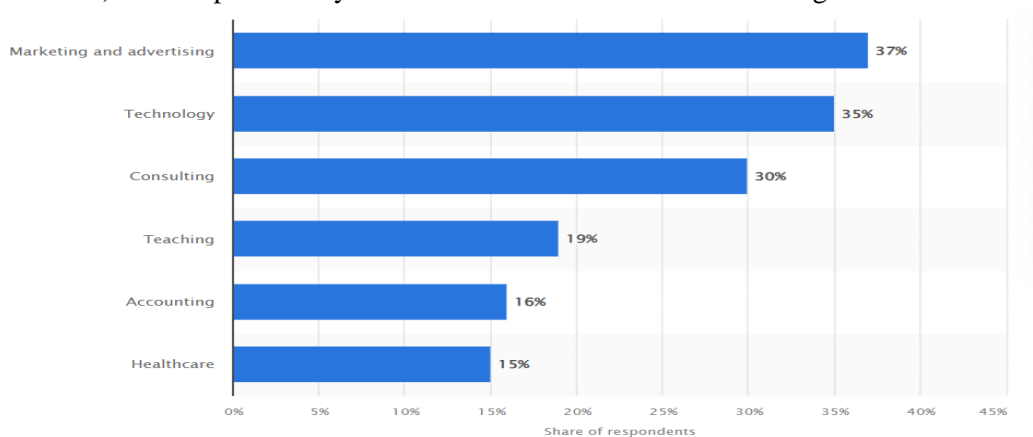


Figure 3: Generative AI Adoption in Workplace
(Source: influencer marketing hub, 2023)

Scalability and Adaptability

The capacity to manage a growing work without an equal rise in labor expenses is a significant advantage of creative AI. It is suitable for company operations that encounter demand changes because of its scalability. Additionally, because of its versatility, generative artificial intelligence is useful for jobs that call for ongoing efficiency, like management of supply chains and prediction of demand.

Ethical and Privacy Concerns:

Despite its advantages, generative AI creates serious privacy as well as ethical issues. In order to address difficulties with prejudice, sexism, and the ethical use of AI-generated information, the research highlights the necessity for efficient management frameworks. For instance, there is an opportunity for AI algorithms could reinforce biases found in training data, producing unfair or discriminating results.

Businesses must address the crucial challenge of ensuring responsibility and openness in AI decision-making procedures in order to reduce these dangers.

Workforce Implications:

The literature emphasizes how generative AI may affect employees. Although it has the ability to replace jobs by automating mundane tasks, this technology also has the capacity to improve human capacities. According to some research, generative artificial intelligence may lead to the emergence of brand-new positions devoted to managing AI systems, formulating AI policies, and deciphering insights produced by AI. To assist employees in adjusting to these new roles, organizations need to carefully organize and execute upskilling and retraining programs.

CONCLUSION

Management of business processes is being fundamentally changed by generative AI, which provides significant advantages in terms of effectiveness, precision, as well as scalability. However, its incorporation must be combined with rigorous data security measures, all-encompassing workforce initiatives, as well as ethical measures. Industry-specific subtleties underline the necessity for customized strategies even more. Discovering Generative AI's maximal potential as well as ensuring sustainable deployment in an ever-evolving business climate will need enterprises to strike an agreement between utilizing its advantages and resolving its flaws as they navigate this changing business climate.

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Generative AI and Changes in Marketing Policies and Trends

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ABSTRACT:

This study focuses on content generation, and personalization, including ethical issues as it examines the effects of generative AI on marketing techniques. Through a thorough analysis of secondary data, researchers pinpoint trends and conclusions. Improved content quality as well as personalized client experiences are made possible by generative AI. However, it is important to address ethical issues like prejudice and privacy. These results highlight the necessity for marketers to take advantage of AI responsibly.

Keywords- Generative AI, marketing, content creation, personalization, ethics.

INTRODUCTION:

The rise of generative intelligent machines (AI) has recently changed the dynamic advertising landscape. These novel methods for content development, interaction with consumers, and data-driven tactics have been made possible by this disruptive technology. The evolving connection that exists between generative artificial intelligence and marketing is examined in this study, along with its effects on business procedures and interactions with consumers. Recent research show how generative AI may be used for a variety of marketing purposes. A conditional variational autoencoder model, for instance, was created by Morandé, and Amini, (2023) to produce personalised product suggestions based on consumer preferences and interaction data. According to their findings, the click-through rate increased by 12% when compared to a control recommender system. A generative adversarial network has been suggested for producing text from customer reviews. The produced reviews allowed businesses to customise review material while maintaining the tone and semantics of actual reviews. Although generative AI opens up new opportunities, some experts advise caution when it comes to data ethics. Additionally, generative AI-based marketing might violate client privacy and damage trust, if necessary, permission procedures and openness are not followed. Businesses must strike a balance between respecting the agency of the client and personalised marketing. Studies also highlight to problems including the exclusion of minority groups from marketing initiatives due to concerns like demographic bias in training data. This study aims to clarify the tremendous impact of Generative AI in determining the coming years of marketing by criticizing previous research, looking at methodology, and studying actual examples.

According to research, generative AI may improve relevance, satisfaction, and engagement through personalised suggestions and content. Businesses must, however, adopt responsible data practises that respect user agency and privacy. For preserving trust, transparency around synthetic media is also essential. In order to reduce bias, toxicity, and other problems influencing output quality, generative techniques still need to be improved through ongoing research.

LITERATURE

The Impact of Generative AI on Content Marketing

The article excels in its thorough analysis of the revolutionary effects of generative artificial intelligence on content marketing techniques. Both newbies and seasoned experts will find it to be a comprehensive review that gives readers a deep understanding. Furthermore, the article's legitimacy is increased by the use of reliable sources, such case studies from respectable businesses, which provide pertinent insights (Mayahi and Vidrih, 2022). The material's accessibility and instructional worth are increased by the presentation's clarity, which guarantees effortless understanding and readability.

Despite being thorough, the paper might dig deeper into the mathematical aspects of generative artificial intelligence, giving individuals who are fascinated by its mechanisms a greater grasp. Additionally, the paper tends to be optimistic, skipping a chance to critically examine potential difficulties and moral dilemmas related to artificial intelligence (AI) generative in content promotion.

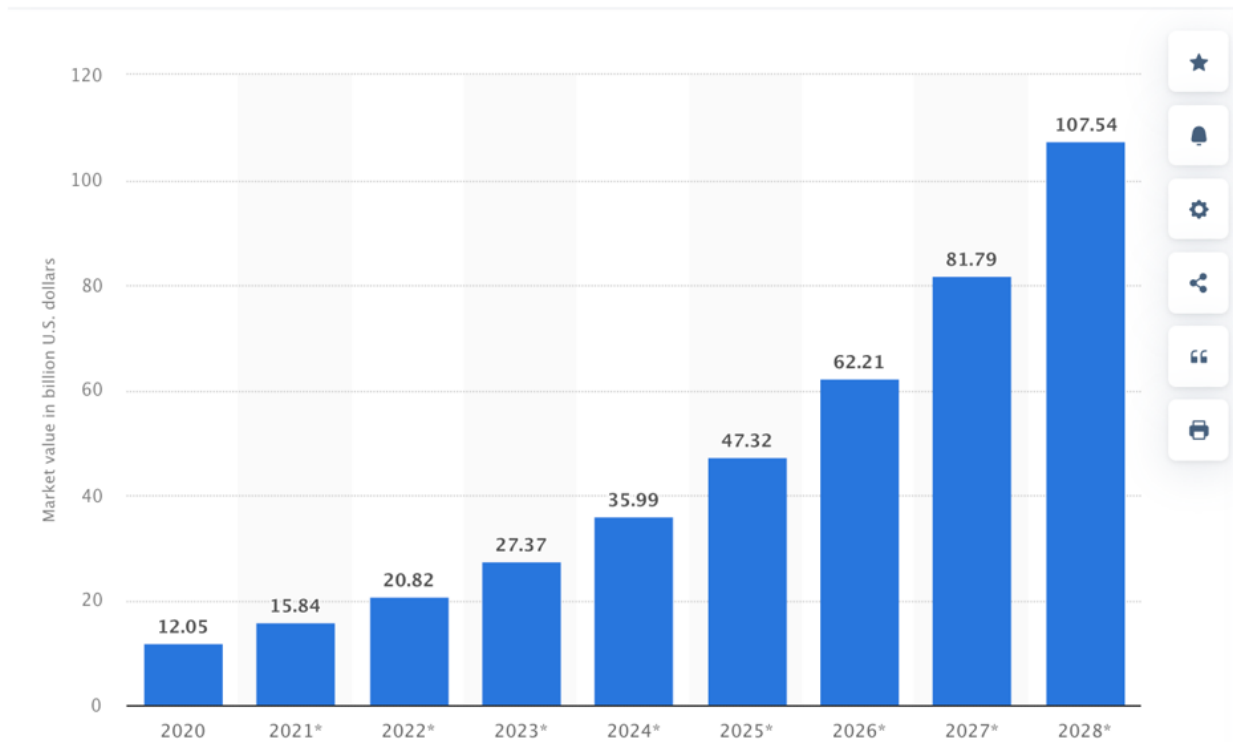


Figure 1: Impact of Generative AI Marketing
(Source: research. a multiple, 2023)

The Ethical Implications of AI-Powered Targeted Advertising

The in-depth examination of the ethical issues raised by AI-powered personalized marketing in "The Ethical Significance of AI-Powered Targeted Advertising" stands out. It provides readers with a thorough analysis of these conundrums, displaying a noteworthy dedication to tackling ethical issues. The article also makes an impression with its impartial position, which acknowledges and engages with all points of view to provide a comprehensive grasp of the difficult problem.

The paper, however, demonstrates a restricted perspective because it largely focuses on ethical issues while potentially ignoring the more general effects of generative AI on marketing techniques. It would be advantageous to have a more thorough discussion of the varied effects of AI (Huh *et al.* 2023). Furthermore, although the article skilfully pinpoints ethical issues, it falls short of offering useful answers or best practices for resolving these issues, leaving visitors in need of practical advice.

The Role of Generative AI in Personalized Customer Experiences

"The Role of Generative AI in Customized Customer Experiences" distinguishes itself by providing readers with real-world examples of how Generative AI can enhance customized client experiences. It demonstrates the technology's ability to improve customer relations with specific examples. The post also stresses the value of data analytics as well as offers suggestions for using customer data wisely (Baek and Kim, 2023). Recent study results and trends are used to make sure the content is current and pertinent for marketers looking for the most recent information.

Limitations or difficulties that can occur when adopting generative AI in customized experiences for clients are perhaps overlooked by the article's leaning toward positive. Its legitimacy would be increased by taking a more objective stance and recognizing both the benefits and disadvantages. Additionally, the article's emphasis on the customer experience can have limited its appeal by excluding the broader effects of generative artificial intelligence on other facets of marketing, including marketing tactics and research on markets, which are also worth investigating.

Generative AI and the Future of Copywriting

By examining the creative possibilities of artificial intelligence (AI) in the context of copywriting, "Generative AI as well as the Future of Advertising" adopts a novel approach. It efficiently illustrates

important topics using storytelling as well as examples from real-world situations to attract readers with its engaging manner.

The article might be strengthened by going into further detail on the scientific aspects of artificial intelligence's generative algorithms (Kothari, 2023). It would be easier for readers to understand these algorithms' workings if there was a more thorough description.

Generative AI's Impact on Marketing ROI

"Generative AI's Impact on Marketing ROI" stands out thanks to a statistical evaluation that offers factual proof of Generative AI's beneficial effects on return on invested money (ROI) in marketing efforts (Morandé and Amini, 2023). The approach of the article is commendable because it explains the research techniques and data sources employed, boosting credibility.

However, because the majority of the results reported in the article are based on unique examples, this may restrict how widely they may be used in promotional contexts. The article also falls short of exploring in-depth the ethical issues surrounding the use of AI for ROI optimization.

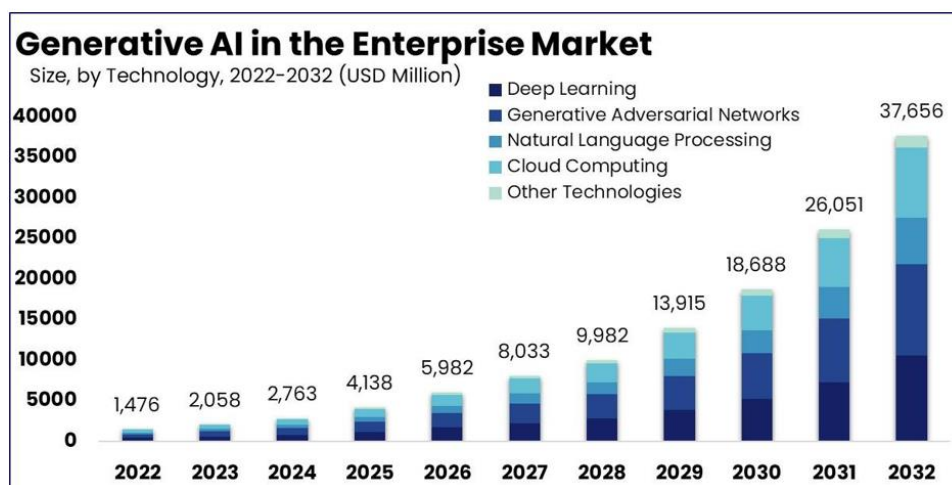


Figure 2: Generative AI in the Enterprise Market
(Source: linkedin, 2023)

Overall Assessment

The examined publications present insightful information about the effects of generative AI on numerous facets of marketing, along with each aspect's advantages and disadvantages. Although it provides a thorough overview, "The Impact of Generative AI on Content Marketing" might go into more technical depth. Though it lacks more comprehensive AI marketing insights, "The Ethical Implications of AI-Powered Targeted Advertising" highlights ethical issues. Although it provides useful examples, "The Role of Generative AI in Personalised Customer Experiences" oversimplifies possible drawbacks. Though it could provide more technical detail, "Generative AI and the Future of Copywriting" artistically analyses AI's function. The study "Generative AI's Impact on Marketing ROI" offers data-supported insights but ignores moral issues.

METHODS

Research Approach

Deductive research methodology is used, commencing with an established theory or hypothesis and evaluating it through the study of actual evidence. This approach provides a methodical and logical exploration of the research issue by endeavouring to validate or disprove the hypothesis in light of the data gathered.

Research design

The descriptive nature of the research's approach emphasizes seeing and documenting already-existing phenomena or traits without changing them. It seeks to provide a thorough and in-depth overview of the issue, providing a greater comprehension of the subject through meticulous documenting as well as evaluation of gathered data.

Data collection and analysis process

In order to gather data for the study on AI's influence on marketing strategies, a thorough analysis of academic literature, business papers, books, as well as trustworthy web sources was conducted. The Macey-Dare (2023) approach has been employed to systematically organize as well as analyse the collected data. This strategy discovered important trends, patterns, and perspectives on the application of generative AI in marketing. A second information-gathering strategy was added to the rigorous source validity checks, guaranteeing a thorough investigation of the use of generative AI in contemporary marketing strategies.

Ethical consideration

Informed permission from participants, data protection, and confidentiality, including preventing discomfort or deceit were all ethical issues. The study maintained the highest standards of research ethics throughout, adhering to ethical principles and respecting the rights and well-being of every participant.

ANALYSIS

The examination of Generative artificial intelligence's impact on marketing strategies reveals important patterns and insights that have been essential for comprehending the technology's game-changing function in the industry. The extensive use of generative AI in content marketing constitutes one of the major conclusions from the secondary data collecting. Numerous instances show how AI-generated content, such as articles, blog entries, and updates on social networks, has enhanced the quality of material while simultaneously increasing productivity. The research also shows how important tailored consumer experiences are becoming. Generative AI is essential for personalizing the user experience, suggestions for products, and marketing messaging to each user's preferences (Wach *et al.* 2023). An increase in consumer engagement as well as conversion rates can be attributed to this level of personalisation. The analysis does, however, highlight several difficulties. Although only skimmed over in the literature, ethical issues demand a deeper analysis. Consideration should be given to concerns including user deception by AI-generated content, biased algorithms, and data confidentiality. The impact of artificial intelligence (AI) on marketing is varied, with both important advantages and moral conundrums. Although it improves personalization and content generation, ethical issues must be resolved for reasonable and long-term use in marketing strategies. This review offers a thorough overview, opening the door for more investigation into this developing topic.

CONCLUSION

Generative AI has significantly improved content development and personalisation, transforming marketing methods. However ethical issues demand close monitoring. Implementing AI responsibly and ethically will be essential for maximizing its capabilities while preserving consumer confidence as the marketing environment changes.

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**CHATGPT AND DIGITAL COMPETENCES IN THE DEVELOPMENT OF
EMPLOYER BRANDING**

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ABSTRACT

The article outlines the scope of the issues surrounding the use of ChatGPT as a tool for creating employer branding. It is presented how the artificial intelligence tool can be used in external activities. The aspect related to digital competences, which are very important in the light of ChatGPT, is also taken into account. The research objective of the article is to assess the impact of modern digital tools based on artificial intelligence for employer branding, i.e., employer branding. Equally important is the use of digital competences, which contribute to the application of more advanced digital solutions. In order to address the research problem, a pilot quantitative study was conducted on a random sample of respondents. The research showed that there is low awareness of the existence of modern artificial intelligence tools and, consequently, the strengthening of employer branding activities through the use of innovative solutions. On the other hand, respondents believe that digital competences, i.e., knowledge, skills and experience to be used in the future, are of increasing importance. The research showed links between employer branding, digital competences and ChatGPT. A limitation of the research is the random selection of respondents, as well as the very nature of the pilot study.

Keywords: *Artificial Intelligence, ChatGPT, Digital competences, Employer Branding*

INTRODUCTION

Employer branding is the process of creating an employer brand, is recognised as one of the most important human resources management processes in companies. More and more organisations are hiring experts in this field to professionally deal with topics related to employer branding inside and outside companies. The term employer branding appeared in the literature in 1996. It was defined by S. Barrow as a tool aimed at creating benefits and added value for companies [Barrow, 1996]. Since then, the concept has been developed and the definition has changed according to its creator. As far as the practitioner's approach to employer branding is concerned, it defines a totality of activities aimed at building such an image of an employer that can be described as an 'employer of choice'. Such companies stand out from others through their organisational culture, working environment and, most importantly, opportunities for development and career planning. The most important employer branding measures that companies should employ include:

- targeting social media and mobile applications,
- organising job fairs, open days, remote webinars,
- getting ambassadors to promote employers,
- interactive games, blogs to support recruitment activities [Nazdrowicz, 2015].

Among artificial intelligence tools, ChatGPT is gaining increasing importance. It is a system that is based on natural language processing. It was developed by OpenAI. The aim of creating ChatGPT is to understand the context of a conversation and to be able to prepare answers to the questions asked. A special feature is that it can generate answers in different languages, including English, German and Spanish. The added value is the creation of answers of different nature and style [Deng, Lin, 2022]. The tool has a very high potential and many possibilities to be used. ChatGPT can therefore be used to strengthen employer branding activities to enhance employer branding.

Digital competences are the knowledge, skills, aptitude to use the latest digital technologies. They are an integral part of operating applications, systems or tools. Employers are paying increasing attention to digital competences in the employees they hire. It is not without reason that digital competences are singled out as the competences of the future.

The aim of this article is to assess the impact of modern digital tools based on artificial intelligence for employer branding, i.e., employer branding. Equally important is the use of digital competences that contribute to the application of more advanced digital solutions.

The article reviews the current literature on the subject using the desk research method, presents the methodology of the research process and the results of the pilot study conducted. The author refers to the latest report results and the conclusions are summarised in the conclusion.

LITERATURE REVIEW

Employer Branding

One of the most important, and crucial, resources in any company is human capital. Companies focus their activities on external customers in order to meet their expectations and provide quality products, or services. Less attention is paid to the employees employed and their job satisfaction, which determines the success of a given enterprise [Vercic, 2021]. It is the success of an organisation that is determined by attracting the best possible professionals and experts in the respective fields [Berthon et al., 2005].

Employer Branding as a term was coined and popularised in the 1990s to describe the entirety of talent management and activities aimed at retaining talented employees. It ranks as one of the most recent approaches to organisational management. The topic of employer branding has been reviewed by many researchers. These can include: S. Tikoo, K. Backhaus, G. Martin, M.J. Hatch or M. Schultz and many others.

K. Backhaus and S. Tikoo believe that employer branding is a process approach focusing on the creation of a customised employer identity. It is primarily based on the creation of a corporate brand that takes into account the interests of customers [Backhaus, Tikoo, 2004]. The corporate brand is designed to keep the organisation at a certain level in the market, so that it is perceived as attractive, also taking into account a strongly qualified workforce [Messini, 2022].

Figure 1 shows a model according to M.J. Hatch and M. Schultz - VCI (Vision - Culture - Image), which graphically illustrates the theme of building a very strong corporate brand. It is based primarily on corporate identity. It consists of three elements:

- the organisational culture, which is directly related to the company's employees,
- the image from a stakeholder perspective as an external environment,
- the strategic vision created by the company led by its management [Hatch and Schultz, 2008].

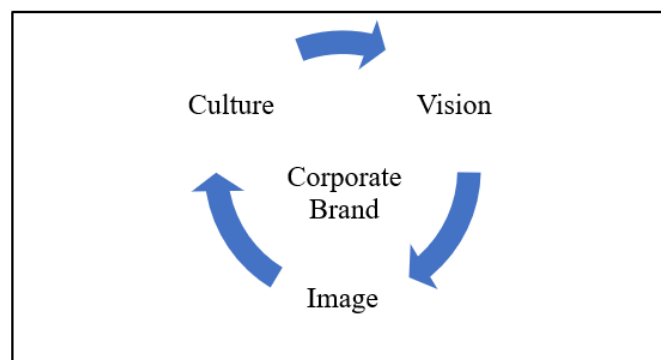


Figure 1. Model according to M.J. Hatch and M. Schultz – VCI (ang. Vision – Culture – Image)

(Source: Own study based on: M.J. Hatch, M. Schultz, Taking brand initiative: How companies can align strategy, culture, and identity through corporate branding, John Wiley & Sons, San Francisco 2008, s. 11)

According to G. Martin, employer branding centres around attracting talented employees to a company. In contrast, the overarching goal is to identify with the company brand itself, its mission, vision and goals. Achieving organisational performance is an important element [Martin, 2008].

The essence of employer branding is for the employer to build a pleasant and good place to work for current employees (this influences their commitment, motivation and many other factors) and potential candidates (the creation of the employer brand in the external market is relevant here) [Szydło, 2022]. Activities have been intensified by the global COVID-19 pandemic, which has determined the attitude of managers to pay even more attention to organisational values [HRM Institute, 2022].

A key one becomes the EVP (Employee Value Proposition), which defines a set of competitive, innovative and attractive values for employees. They are designed to meet employees' expectations and desire to stay longer in the organisation. EVPs need to be tailored to the individual and have enough impact that the employee will bond with the company. [Matuszewska-Kubicz, 2021]. Over the last few

years, one can observe a change in the tools that are used in employer branding activities. These can include:

- the rise of social media tools (TikTok, Instagram Reels) - employer branding is done through the aforementioned tools, which potential employees from generation Z, or Millennials, look into on a daily basis. This builds interest and creates an engaged community.
- the creation of an EVP (Employee Value Proposition) represents the preparation of unique, innovative values for the employee that the employer can offer. Activities are diversified depending on the target group.
- candidate experience, i.e., the experience, emotions and impression that accompany the person who will be employed by the company. Everything contributes to employer branding.
- various forms of remote working are even becoming a standard expected by employees. It is not a differentiator for competitors [Buczowski, 2022].

Increasingly, artificial intelligence tools are being used for employer branding activities which include: ChatGPT. The tool has found application in employer branding. It includes activities such as:

- assisting potential job candidates in recruitment processes,
- supporting recruitment processes by responding to various enquiries,
- maintaining continuous automated interactions,
- automating training and influencing employee development in a broad sense.

Technologies that use artificial intelligence are a key component of Applicant Tracking Systems (ATS) to track candidates. As such, technologies that identify the best candidates for a vacancy in seconds. ChatGPTs are used to automatically respond to candidates in real time. They also allow the responses to be personalised and the information provided to be highly relevant. The use of these types of tools directly affects the recruitment process itself, but also the overall focus of employer branding [Ordioni, 2023].

ChatGPT (Generative Pre-trained Transformer) is a language model that was developed by OpenAI. This type of model uses very deep learning in its specification, which is intended to prepare human-like responses. It is worth mentioning that the tool is public [Kirimani, 2022]. The possibilities for using ChatGPT are very diverse. The tool is characterised by the fact that it can respond to text requests, answer questions or perform more advanced and complex tasks, e.g., in human-to-human discussions [Liu et al., 2021], as well as work in a remote working model [Nowacka, Jelonek, 2022].

ChatGPT can support companies in creating a strong and competitive employer brand. Special attention should be paid to its broad functionalities. Chatbot applications can easily present the values, corporate culture and benefits that potential candidates can gain. ChatGPT also offers content creation, social media posts, blogs, signatures. All this determines the maintenance and further creation of the employer brand at a very high level [Kaur, 2023].

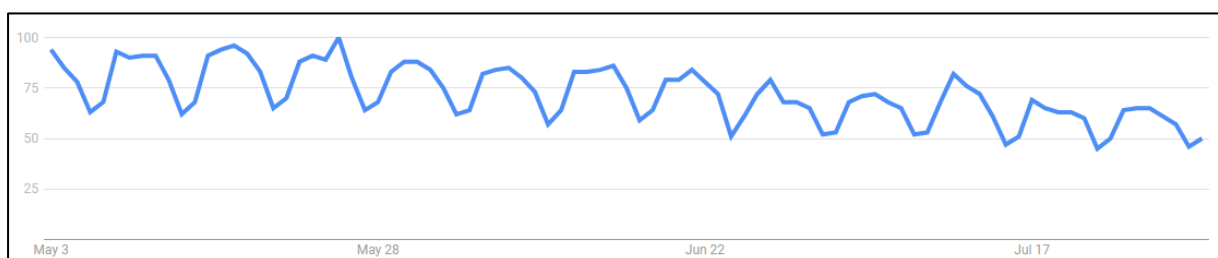


Figure 2. Trend for the word ChatGPT

Figure 2 shows searches for the phrase 'ChatGPT' in the Google Chrome browser by users from around the world over the last three months.

(Source: Google trends)

The graph is characterised by a high frequency of searches for the word by users. There were more searches at the beginning of May. As time went on, interest decreased slightly. In contrast, searches for information on ChatGPT are very popular.

Digital Competences

The implementation of modern technology-based tools would not be possible without so-called digital competences. According to the Council of the European Union, digital competences are among the eight other competences that are essential for lifelong learning. The others include: reading competence, social writing competence, multilingual competence, etc. [European Union, 2018] and abstract thinking [Jelonek, Stepniak, 2014]. According to Wan Ng, digital competence is the outcome of three dimensions, which include:

- technical - encompasses all the technical skills through which digital technologies can be used,
- cognitive - is based on skills related to critical thinking, which is associated with the creation of digital information,
- social-emotional - is related to the responsible and rational use of resources such as the Internet in order to establish relationships [Ng, 2012].

Digital and technical competences are categorised as hard competences. However, what is most relevant is that they cannot be explicitly categorised as data analysis, programming or digital skills in the broadest sense. Digital competences need to be looked at a bit more broadly also from the perspective of solving difficult problems [Włoch, Śledziwska, 2019]. Digital competences need to be adapted to changes in the external environment. Skills, knowledge, experience in the field of digitisation allow one to find oneself quickly in a turbulently changing world.

Digital competence can include:

- digital mindset, which defines an openness to understanding the mechanism of technology, and therefore an agile and flexible understanding of the world, as well as the changes in it. It is also an innovative approach that has the capacity to adapt very quickly. It is characterised by interacting with the digital world and using the tools available,
- lifelong learning, which is a key digital competence. Continuous, permanent change requires continuous learning, the acquisition of new knowledge, as well as the acquisition of different skills. Within lifelong learning we can mention: reskilling is the result of technological progress, which results in the acquisition of new competences, skills that enable us to put ourselves in a role that is new to us. The opposite is upskilling, which involves modifying what we have already acquired in terms of knowledge, competences or skills. Lifelong learning accustoms people to the fact that knowledge is not a fixed element. What we know and know today may be ephemeral.
- digital tools and platforms are an integral part of digital competence. Digital knowledge and skills enable proficient use of digital tools, which also respond to the changing external and internal environment. Both digital tools and platforms are under constant development. They are being adapted to different business models of companies [Digital Univeristy, 2021].

There is therefore a very high correlation between artificial intelligence tools, of which ChatGPT is one, and digital competence. The knowledge and skills of employees must keep up with digital innovations, which are constantly evolving. This will maintain competitiveness and has a direct impact on the continuous improvement of quality of life. ChatGPT, as an advanced technology, influences employees' digital skills, which are related to the use of communication tools or the creation of new content. With digital competence, it is easier to understand the mechanics of artificial intelligence, and therefore to use algorithms to achieve various business and strategic goals. It also translates into longlife learning in areas related to digital technologies [Frackiewicz, 2023].

Another aspect worth considering is the importance of digital competence in the VUCA environment. Given the rapidly changing environment, VUCA determines the entirety of digital and technical competences [Nowacka, Rzemieniak, 2022]. Which makes longlife learning even more important.

METHODOLOGY OF RESEARCH

Based on a critical analysis of the literature, the research objectives were identified:

- to evaluate artificial intelligence tools that are used in employer branding,
- to evaluate the usefulness of ChatGPT in employer branding,
- assessment of the relevance of digital competencies in employer branding.

In this article, the author set the following research hypotheses:

H1: The use of ChatGPT positively influences a company's employer branding.

H2: Digital competence determines knowledge of modern digital tools to improve employer branding.

H3: Employer branding significantly influences the perception of companies by potential candidates. The critical analysis of the literature carried out was the basis for the preparation of the research tool. Quantitative research was conducted from 31.07-06.08.2023 on a random sample of respondents. Respondents completed an online questionnaire, which was made available on a platform on the website. Those responding to their questions were provided with a link to the questionnaire. The survey was fully anonymous and participation was voluntary. It is worth mentioning that the survey had a pilot character.

The survey consisted of 6 factual questions and a metric. The limitation of the survey is the random sample of respondents and the very nature of the survey showing a certain section of trends. The research focused on the thematic areas addressed in the article, namely employer branding, digital competences and artificial intelligence tools, including ChatGPT. 250 respondents took part in the survey.

Gender	Female	139	55,6%
	Male	111	44,4%
Age	Less than 25	38	15,2%
	25-40	80	32%
	41-60	86	34,4%
	More than 60	46	18,4%
Position	Specialist positions	196	78,4%
	Manager positions	54	21,6%

Table 1 presents a metric describing the respondents. It includes information on the gender, age and positions of the respondents taking part in the survey.

Table 1. Metrics of respondents'

(Source: Own study)

Respondents were employees in industries such as trade, construction, energy, industry, finance and services.

THE RESULTS OF STUDIES

The subject areas addressed in this article are very important as they affect the position of companies in the market and their competitiveness vis-à-vis others. The questions posed to the respondents were of a general nature. Table 2 shows the respondents' answers to the questions asked in the online questionnaire.

The first question asked in the survey was whether respondents knew what ChatGPT was and what it consisted of. More than half of the respondents, 54.8 %, do not know what ChatGPT is and what it is used for. In contrast, 45.2% of respondents have a basic knowledge of the artificial intelligence tool.

Question	Answers	Respondents' answers	Respondents' answers in [%]
Do you know what ChatGPT is?	Yes	113	45,2%
	No	137	54,8%

Table 2. Respondents' answers regarding their knowledge of ChatGPT

(Source: Own study)

For further analysis, the responses of those respondents who know what ChatGPT is and answered the question in the affirmative were taken into account. Familiarity with the tool makes it possible to answer the other questions in the survey.

Table 3 shows the respondents' answers to questions on employer branding and digital competences. The first question asked whether employer branding and its activities have a positive impact on the

brand of the company to which potential candidates wish to apply. The results show that 51% of respondents answered in the affirmative - agreeing that all activities that influence employer branding are perceived positively. In contrast, just under 49% of respondents believe that employer support activities do not have an impact on their final choice. This is very often due to the fact that people working in other departments within companies are not informed of what activities are undertaken as part of internal and external employer branding and do not pay attention to such activities when looking for a new job. The second question referred to the importance of digital competence in today's world and knowledge of modern IT tools or software designed for this purpose. More than half of the respondents believe that digital competence determines knowledge of modern IT tools. Knowledge and skills in this area allow for quicker use of new tools and programmes appearing on the market. A negative perception is found in 48% of respondents. They believe that there is no correlation between digital competence and the tools used to operate the programmes.

Question	Answers	Respondents' answers	Respondents' answers in [%]
Do you think that a well-chosen Employer Branding positively influences the perception about the company by potential candidates?	Yes	58	51%
	No	55	49%
Do you think that digital competence determines knowledge of modern IT tools / programmes?	Yes	59	52%
	No	54	48%
Do you think that ChatGPT as one of the artificial intelligence tools influences the Employer Branding activities undertaken by companies?	Yes	48	42%
	No	65	58%

Table 3. Respondents' answers to the survey questions
(Source: Own study)

Another question in the survey referred to the impact of ChatGPT on the employer branding activities that companies undertake. Only 42% of respondents believe that ChatGPT can influence the actions taken by companies, while a staggering 58% believe that it cannot. Respondents see no need for artificial intelligence tools to support employer branding activities in the market.

Figure 3 shows respondents' answers to the question: which employer branding activities do they consider most important. According to the respondents, the most important are: organisational culture (34%), the importance of social media to communicate information about employers (32%) and other employees' opinions about employers (31.2%). Respondents consider the following to be the least important: EVP as a set of unique values for a given company (14.4%) and Candidate experience referring to the entire recruitment process (16%).

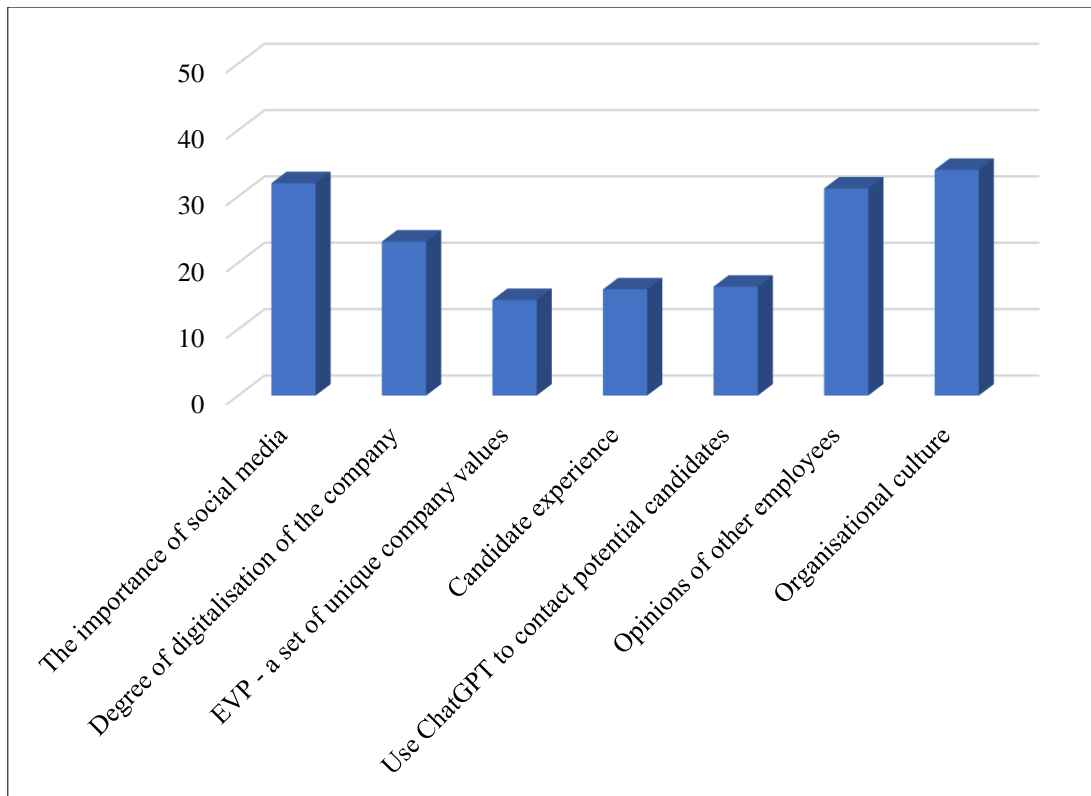


Figure 3. The most relevant Employer Branding activities
 (Source: Own study)

Figure 4 shows the key digital competences. Respondents consider the most important digital competence to be: using different types of applications, programmes (49.2%), skills that are related to finding information in the digital world (46.8%) and communicating with other colleagues using digital technologies (38.8%). They consider the following digital competences to be the least key: residing (22.8%) and creating new digital solutions (26%).

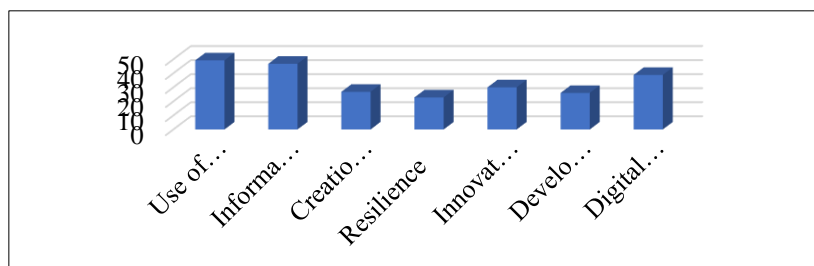


Figure 4. Key digital competences
 (Source: Own study)

The results of the respondents' answers and their perceptions on the topics raised in the article are determined by a number of factors, which can include: the age of the respondents, their job guard, the industries of the company they are employed in and their position. Employees who are more connected to technology on a day-to-day basis work in these areas, or generation Z, who are familiar with technology, see greater opportunities for the use of artificial intelligence tools along with their impact on employer branding.

CONCLUSIONS

The topic addressed in this article is very important and topical due to the ubiquity of digital technologies. Nowadays, people are surrounded by tools, programmes, applications that, on the one

hand, help in their professional and private lives and, on the other hand, have to be learnt in order to "be up to date" with them. More and more companies are allocating financial resources to digitalise and streamline existing company processes. The same is true for employer branding, which directly affects a company's position on the labour market and its competitiveness when it comes to the external environment. We should not forget about all activities that affect internal employer branding and, consequently, the wellbeing of employees. By automating and digitalising processes, more and more modern solutions are being used, including artificial intelligence tools. These include ChatGPT. The research showed that not all respondents know what a modern tool is, its use and functionalities. Although those who answered in the affirmative that they knew what ChatGPT was in the questions on use were unable to relate the answers to reality. This means that the topic of ChatGPT is innovative and abstract for them. It is hard for respondents to imagine what it could be used for in areas of employer branding.

The first research hypothesis - The use of ChatGPT positively influences a company's employer branding - was negatively verified. Despite the fact that respondents know what ChatGPT is, they cannot relate its use to the real activities for which it can be used. This is because they do not have sufficient knowledge of the tool itself and its capabilities. It is hard for them to link a given employer branding activity to a specific ChatGPT functionality.

The second research hypothesis was positively verified - Digital competence determines knowledge of modern IT tools for improving employer branding. Respondents know what digital competences are and realise their relevance at work. More and more applications or programmes require specialised knowledge and skills on the part of employees. Respondents indicated which digital competences are important. They are also linked to employer branding. Increasingly, employer branding strategies make use of modern digital tools that require specific skills, and therefore digital competences, from those operating them.

The third research hypothesis was positively verified - employer branding significantly influences the perception of companies by potential candidates. Respondents believe that the methods used by companies to create their employer brand in the labour market are perceived and evaluated very positively. The more specialised channels an organisation uses to communicate and reach out to potential candidates, the greater the chance of attracting a person with the required competencies and experience. Companies compete on the market by promoting themselves through the implementation of more and more modern digital tools, flexible working arrangements or a turquoise organisational culture.

The research showed that there is low awareness of the existence of modern artificial intelligence tools and, consequently, the strengthening of employer branding activities through the use of innovative solutions. On the other hand, respondents believe that digital competences, i.e., knowledge, skills and experience to be used in the future, are of increasing importance. The research showed links between employer branding, digital competences and ChatGPT.

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Comparative Study of Machine Learning Techniques for Prediction of Kidney Disease

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Abstract:

As kidney chronic disease is nowadays widely increasing which either caused by kidney disease or reduce the function of the kidney, it also affects the cardiac problems- scientifically which can lead to sudden heart attacks at the end-stage. Early diagnosis and adequate therapies can only help in stopping this disease, where dialysis and kidney transplantation is the only way to save the life of the patient. Detecting kidney disease through machine learning and through data mining techniques which can reveal the hidden problem of the kidney. Therefore, the current article is based on the comparative study using various Machine Learning techniques to detect kidney disease. This survey supports to find the accuracy of algorithms which are more useful to find the kidney disease in early stage. The comparative study of all the algorithms and by implementing the models on different platforms, and it is analyzed that which is the best algorithm to predict CKD (Chronic Kidney Disease). The machine learning techniques are compared like Probabilistic Neural Network (PNN), Multilayer Perceptron Algorithm (MLP), Logistic Regression (LOGR), Regression Tree (RPART), Support Vector Machine (SVM) and Radial Basis Function (RBF).

Keywords: Classification, Machine Learning, Kidney disease Detection, Feature Extraction, Data Mining Technique

Introduction

Data mining strategies include association rule mining to find common patterns, forecasting, grouping, and clustering. The data mining techniques are more useful especially in the prediction of heart disease and kidney disease. Data mining was used to discover patterns from the vast quantity of collected information and then to create predictive models. There is a large amount of data to be interpreted in the medical field. The mining of medical data improves the quality of patient care and the prediction of medical trends.

It is a chronic condition associated with the condition of being diseased and mortality, it may have a high risk of heart disease and it may cost a huge amount for recovery. To stay alive, there are millions of people worldwide sufferings from this disease and only a small percentage of people get the treatment to live. The main objective is to predict the best technique and accuracy, sensitivity and specificity of the dataset.

The technique is been used to reveal and extract hidden problems from the patients so that it may be easier for a physician to maximize the accuracy in the identification of the disease. Among the 24 parameters, they only will have seven parameters they are: Hemoglobin, albumin, diabetes, blood glucose, creatinine, and pus cells.

They have predicted the CKD (Chronic kidney disease) in many different forms by using different algorithms. They have seen that mostly the UCI repository data set is used for the prediction. They compare all the algorithms and the different models used to predict CKD. They get to know that PNN, random subspace, boosted decision tree, ANN, Naive Bayes gives the best result from other algorithms. In other papers also prediction is done on the same dataset and the accuracy was taken out by using different algorithms. In an another paper, naive Bayes gives the best result among other algorithms.

Rest of the paper is organized as follows. Section 2 provides literature review work, Section 3 presents technical discussion of different machine learning algorithms, the comparison model is considered in the section 4, Experimental result is illustrated in section 5. Finally Section 6 presents conclusion and future work.

Literature Review

The aim of our survey is to find out the best technique based on the accuracy. The current research compares the mining technique like probabilistic neural network (PNN), multilayer perceptron algorithm (MLP), logistic regression (LOGR), regression tree (RPART), Support vector machine (SVM) and Radial Basis Function (RBF) and many different algorithms also.

In the research, authors have taken the probabilistic neural network as a kind of neural network of Radial Basis Function which is an algorithm for one-pass processing and very linear design. The strength of it is fast testing and simple adjusting. It consists of 4 layers as the input layer, pattern layer, summation layer, and output layer. MLP is one of the main neural network types, consists of an input layer; it may contain 1 or more hidden layers and output layer. It is been successfully done to solve complex or differentiated by the best algorithm that is the error backpropagation algorithm, to train them in a supervised manner.

SVM is the method for both relevant and irrelevant classification. It uses a nonlinear mapping to restore to a higher dimension the unique training data. It examines in a "decision boundary" the linear optimal hyperplane separating relevant data from another. The hyperplane is been used to separate the wanted and unwanted data [1]. Another tool i.e. RBF also consider for the same problem. RBF is a neural network algorithm that needs fewer networks learning computation time. It contains 3 layers: data layer, hidden layer, and output layer. These nodes are been connected within each network. Input variables are passed from the input layer without any weights directly to the hidden layer

There are 5 stages of the kidney but they take only 2 stages and measured by eGFR(estimated Glomerular Filtration Rate) formula. In this creatinine (It is the waste product which is removed from the body and filter the blood and release into urine) is taken, the age of the female is been taken. They have done the testing and validation of different algorithms at different stages.

In a paper, authors have investigated the kidney chronic disease with the help of some methods of machine learning. In this study, they have predicted the methodology in which they compare the data parameters and the attributes. In machine learning, they will test the classifiers by 4 methods by which we will get the accuracy, sensitivity, and specificity.

It contains the MI methods which are regression tree (RPART), Support Vector Machine (SVM), MLP and Logistic Regression (LOGR). They compare them based on sensitivity, accuracy, precision, specificity, and error. By the help of dataset, the information which they have to analyze have following things, which shows the relationship between input parameters which will reduce the number of parameters needed for prediction of CKD and will remove unwanted parameters, it is also analyzed with the help of urine test and blood test for diagnoses, and also used to analyze the best method to overcome from CKD early. The dataset has some missing values so it is represented in the form of the matrix, it contains parameters and participants. In this, the MI uses regression analysis for filling the missing values. The parameters derived from a urine test and blood test states that in blood test the plasma volume gets down and the red blood cells increases. They started with the 24 parameters and will become over with only 7 subset parameters. In this, the highest sensitivity is achieved by the MLP and LOGR and the other methods are followed. This method is more stable and shows the best result. As per the F1 score, it is identified that the MLP and LOGR are the best and RPART overcomes the SVM model.

In the research of, authors have seen that kidney diseases are also affecting the cardiac diseases which are known as cardiorenal syndrome. When a patient goes through the ECG that CKD can also undergo which can be a major issue for the patient. The database is been collected from the PTB and fantasia. It's between the old age from 50 to 70 years. In this the first step will be doing is that extracting digitalized ECG data from the database. To find the best features we have to use the QT(it is used in ECG and the wave start from Q and ends with T wave) and RR (it is the time elapsed between two R waves) intervals. The author have used supervised learning because data set contains some pre label data and they have used SVM. As the SVM is best for classification tool and gives the best accuracy at less time.

In this research paper they have come to know about other data mining technique and they are as: ANN, SVM, KNN, RBF, and random subspace were used in the dataset consist of 400 samples and 24 attributes and with particle swarm optimization. The result is been compared with the test results. The

highest accuracy was of random subspace mining. In this paper, they have used many different algorithms with their authors and then they will predict which is best. Random subspace is used because in this the smaller parts are trained and it uses the subspace for actual data size. It is used in large datasets attributes. These algorithms reduce the time, over learning and easy to understand, simple. All these data mining algorithms are applied with the help of PSO (Particle Swarm Optimization), random subspace has the best accuracy.

The paper, presented the study using WEKA tool. They have identified that which is the best among J48 and random tree by using WEKA Tools. It is a powerful tool that is used for the classification model. It is the collection of algorithms for data mining tasks. It has 4 modes to do work: Simple CLI, Explorer, Experimenter, Knowledge flow. In this paper, they have used the decision tree also for classification of relationships and to identify subgroup differences. J48: By using the information gain and examines the same for the result of an attribute for splitting the data from the training data set to make a decision tree. After this, it requires smaller subsets. If all instances contained in the same class then the procedure stops. J48 is also known as C4. Random tree: It is the method for constructing a tree that needs k random features at each node. Weka generates full classification for each node. Powerful and accurate, good performance on. This paper is classified on the bases of blood groups in different regions of Gujarat. In this paper, author have explored the different association rule algorithm i.e. Apriori association rule mining, filtered, Tertius, predictive. Among all Apriori association rule mining is best. They have found the pattern of system usage by teacher and student for developing the learning system model is used for data. By this, they can prevent different types of cancers. By comparing all 4 we predict apriori is best and it is best because the output it presents is all yes.

The research is based on the comparison of the accuracy on various algorithms like Apriori, Tertius. All the algorithms are compared on the different measures like support, confidence and predictive accuracy. Support measure frequency; trust measure strength and predictive precision is used to measure the concern of generated rule. They can take the mean, median and mode from this algorithm. The author suggests that as CKD affect the body and the treatment is at high cost. The study uses the UCI datasets by using the Bayesian classification algorithm, KNN results are obtained by classifying algorithms and SVM. The classification is done on basis of raw data, gain ratio, relief. The data pre-processing is done in which feature selection algorithm is done on basis of relief and gain ratio. For the classification the algorithm used are SVM, KNN, naïve bayes it is done on the 10 fold cross validation method. The best result is given by KNN.

In this author contains the same dataset from UCI machine learning repository in this they have to predict the CKD by a boosted decision tree, deep support vector machine. And by this, they predict the best accuracy by boosted decision tree it is robust and not over fit in training data. Their model can work with any kind of data set. Their model is based on cloud platform because of the fast evaluation of data. It is implemented with the help of the Azure platform in machine learning.

This paper tells that they have unwanted data which is collected from the healthcare industry to decide for the diagnosis of diseases, in this they will use the algorithms of KNN and Naive Bayes produces more result than KNN. Classification is supervised learning assign objects into classes. In Naive Bayes the dimensionality is high and in these variables is independent on each other. The Bayes theorem provides the favorable outcomes done upon the total no of outcomes. The algorithm is run on the rapid miner tool.

This paper also tells about the prediction of kidney disease through the implementation of data mining algorithms. Algorithms are as follows back propagation, neural network, naive Bayes, decision table, decision tree, KNN and one rule classifier in this also naive Bayes is best. In this, no classifiers are used to predict the CKD. ANN is a nonlinear approach that uses spread back to learn with one or more hidden layers. Naive Bays is also been used and J48 is used which helps in making binary tree acc to divide and conquer concept to divide data. In this decision, a table is used for visualizing and an inducer. There are three components action row, condition row, and rules. It was done on the weka tool on this it is classified based on the instance, sensitivity, specificity, time cost, mean absolute error and ROC area. The six algorithms is used in its naive Bayes, multilayer perception. J48, KNN, one rule, and decision table. Naive Bayes is best of all.

Comparison Model

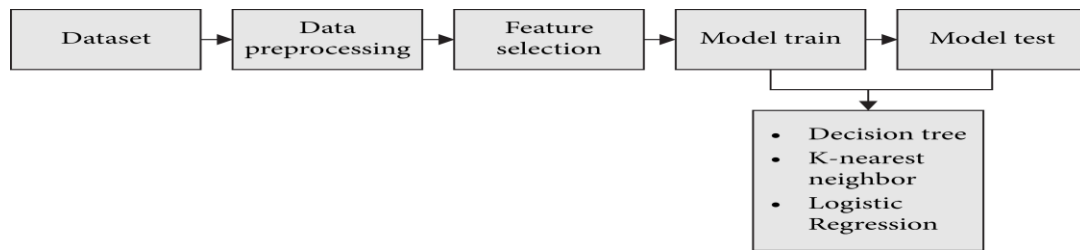


Fig.1. The Machine Learning Model.

PNN: It is a neural feed forward that is used in problem of classification and pattern recognition problem. It is faster and more accurate than multilayer perceptron networks. It approaches Baye's optimal classification and them relatively insensitive to outliers. The network contains the four layers. Input layers, pattern layer, summation layer, output layer. PNN is slower than MPN for classifying of new cases

It requires more space to store the model.

There are data patterns yet which has it predefined classes $h=1 \dots H$, the probability of y belonging to class h equals rg , the cost is $y CG$, the probability density function is $x_1(y), x_2(y), x_3(y) \dots x g(y)$. [12]

MLP: It is a neural network connecting multiple levels in a directed graph which states a single path will go only to one path. It is used in supervised learning. It is a finite acyclic graph. It contains nodes which are neurons with logistic activation. By it, we can calculate the complex functions by combing many neurons. There are three layers in it: an input layer, hidden layer, output layer.

Logistic Regression: It is going to a method for binary classification problems, it uses a logistic function to model the binary dependent variable and it contains the two values 0 or 1, true or false. It is used to predict the risk of developing the disease. In regression analysis, logistic regression is estimating the parameters of the logistic model.

Regression Tree: It is the iterative process that splits data into branches or partition. It has target values. Deciding on regression is much easier than another method. We can continue to splits each branch into smaller groups.

Support Vector Machine: It is a supervised learning model related to learning algorithms that are used for classification and regression. It constructs the hyperplane in high dimensional space. It separates the linear and nonlinear points. In this, the straight-line equation is been used $y = mx+c$, and for mid hyper planes, $mx+c$ will be equal to 0, when $mx+c$ will be 1 then all positive values will be there, and when $mx+c$ equals to -1 then negative values.

Radial Basis Function: A radial basis function is a real-valued function which is defined as $\phi: [0, \infty) \rightarrow \mathbb{R}$. It is a simple single-layer type of artificial neural network. It gives the approximate value of the given functions

Experimental Result

DATASETS: UCI machine repository contains a data set . The dataset of Apollo hospital India which has the 24 parameters and classified as non-CKD and CKD. Another dataset from online from PTB and fantasia.

Using the DTREG Predictive Modelling Program, the following analysis was done. The comparative analysis of the algorithms used was made on the basis of classification reliability and execution time performance measurements. A K-fold cross validation technique was used for model testing and validation. During the study, incomplete predictor parameter values have been replaced by press.

ALGORITHM	ACCURACY	RESULT
SVM	84.7%	Morphological operators are used along with canny edge detection method. After that the classification is done on the basis of SVM.
PNN	96.6%	For fast testing and simple adjusting PNN is been used
MLP	51.5 - 98%	Solve complex problems differentiate the problems
RBF	87%	It requires the less leaning computation time
RPART	95%	It helps in the splitting of data into branches
LOGR	98%	It signifies the features

Table 1: Comparison of accuracy of Various Machine Learning Algorithm

Conclusion

Finally, the PNN provides the highest percentage of overall detection accuracy. In this MLP, they require a minimum time interval. This algorithm is classified on reliability which is defined on the patient level. The PNN defines the best accuracy and efficiency prediction. In these days, and is a globally leading which causing the high death rate. It is because of the last stages of CKD may lead to the CVD. About CRS, many people are suffering from cardiac disease may suffer from, CKD suffered patient may suffer from cvd whose treatment is limited. So that why the models are been classified to detect the disease from their digitized ECG in the early stages using algorithms.

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