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Message from Director

Namaste!

We are living in an era increasingly shaped by algorithms, intelligent systems, and data-driven decision-making. *The Algorithmic Age: How AI, Data, and Automation are Reshaping Society* captures the essence of this transformation, where technology is fundamentally redefining work, life and their interaction.

Artificial Intelligence, big data, and automation are no longer distant concepts; they are deeply embedded in our daily lives. From healthcare and education to governance and global business, these technologies are driving innovation, improving productivity, and opening new frontiers of possibility. At the same time, they bring with them complex challenges related to ethics, privacy, employment, and equity.

As an academic and research community, we have a responsibility to critically engage with these developments. We must strive to understand not only the opportunities but also the implications of an increasingly algorithm-driven world. Building systems that are transparent, inclusive, and aligned with human values is essential to ensuring that technological advancement benefits society as a whole.

This work serves as an important contribution to the ongoing dialogue on digital transformation. It encourages thoughtful reflection and informed action as we navigate the opportunities and challenges of the Algorithmic Age.

Let us embrace innovation with responsibility, guided by knowledge, ethics, and a shared vision for a more equitable and sustainable future.

Dr. Adya Sharma

Professor and Director,

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From the Editorial Desk

This collection of papers offers a comprehensive exploration of the transformative impact of Artificial Intelligence across finance, marketing, customer service, education, and organisational behaviour. While highlighting gains in efficiency, personalization, and decision-making, the studies collectively underscore critical concerns around ethics, trust, human judgment, and institutional readiness, advocating a balanced, human-centric approach

Nandita Patra's paper provides valuable insights into the impact of AI adoption on faculty productivity in higher education institutions. It reveals that while AI is perceived as useful and accessible, initial adoption challenges may temporarily hinder performance. The study highlights the importance of institutional support, training, and adaptation in leveraging AI effectively.

Manan Agarwal critically examines the transformative role of AI and automation in financial reporting, highlighting improvements in efficiency, accuracy, and the indispensable role of human judgment and ethics. The study reinforces the vision of a collaborative human-machine interaction in accounting.

Elias Rufino dos Santos Neto & Wilton Garcia focus on influencer marketing; this paper investigates how trust and credibility shape consumer purchasing behaviour in the digital age. Through an exploratory and interdisciplinary approach, it highlights evolving strategies for strengthening brand and consumer relationships. The study reflects the dynamic intersection of technology, communication, and marketing innovation.

Midhvan Agarwal explores how AI is revolutionizing customer service through enhanced speed, personalization, and operational efficiency. It also raises important concerns regarding data privacy, bias, and the erosion of human empathy. The paper advocates a responsible integration of AI that complements rather than replaces human interaction.

Lalitha Ganesan & Kulsoom Mubeen examine the growing use of AI-generated content and its implications for brand credibility and consumer trust, focusing on the challenges related to authenticity and ethics. The study underscores the need for balancing automation with human creativity and insight.

Matheus Gonçalves de Britto & Wilton Garcia explore the influence of AI on organisational behaviour, particularly in people management, corporate culture, and decision-making. It brings attention to the ethical, social, and legal dimensions of AI integration. The study emphasizes a thoughtful and adaptive approach to navigating technological change within organizations.

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STUDENT'S RESEARCH CONCLAVE 3.0

The Algorithmic Age:

How AI, Data, and Automation Are Reshaping Society

[Marketing And Brand Management]

5th December 2025

Influencer Marketing, Digital Consumer and Social Media

1. *Centro Paula Souza – CPS*

Faculty and Technology [Fatec] of Itaquaquecetuba

E-Commerce Management Course

Influencer Marketing, Digital Consumer and Social Media

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ABSTRACT

This study is part of the activities linked to the Technological Communication Laboratory #Labtec_ at Fatec Itaquaquecetuba, in the Centro Paula Souza, with support from the São Paulo State Research Support Foundation (FAPESP). The following research question arises: how does influencer marketing affect consumer purchasing decisions in an era where social media has become a means of communication between brand and customer? The aim is to identify which factors lead consumers to trust content creators, and which strategies brands can use to develop a strong connection between product and consumer. From a methodological standpoint, proposed in essay format, the interdisciplinary qualitative research adopts an exploratory approach, based on a literature review. Theoretically, a line of *contemporary studies* is the strategy of updating and/or innovation. Thus, the expected outcome demonstrates a creative and flexible transition in the production of information and technology, along with other formative practices in the field of technological education.

Keywords: Digital Consumer, Influencer Marketing, Social Media

INTRODUCTION

In recent years, the development of social media has significantly changed the way consumers connect with brands and make their purchasing decisions. This new communication scenario fosters the emergence of a dynamic digital environment, strategically with interactivity and data dissemination (Kotler; Kartajaya; Setiawan, 2017).

The disciplines related with this paper are “Consumer Behavior in the Digital Age” and “Principles of Digital Marketing” from the E-Commerce Management course. Both are taught by the advisor. Therefore, this study is organized within the Management, Information, and Technology axis, according to the classification of Centro Paula Souza – CPS.

Figure 1: *Institutional Logos*



In this way, this paper was proposed at the Technological Communication Laboratory – #Labtec_ at Fatec Itaquaquecetuba, to instill a culture of scientific and technological research within the Teaching Unit. Set up with resources from the São Paulo Research Foundation [Fapesp] (Fig. 1), #Labtec_ is an

interdisciplinary space that enables technological experimentation by students and faculty. It develops content (interviews, photography, video, animation) for the world wide web.

JUSTIFICATION

The social networks have been intensifying in recent years as a means for obtaining data and promoting products or services, through ads, publicity, and posts. Because of this, it becomes interesting to study this environment alongside consumer behavior and how digital influencers become responsible for maintaining the connection between brand and consumer. Such influencers, as public figures, gain notoriety and visibility on social networks – Instagram, Facebook, TikTok, Youtube.

The use of these electronic tools goes beyond just content promotion. Social networks enable real-time data collection, such as comments, viewing time, and likes. These metrics provide more and more insights on engagement, preferences, and consumption patterns.

This paper is justified by the relevance these digital means assume in the process of interaction between brand and audience. The acquisition of data and relevant information about user preferences in their purchasing decisions are factors that impact the digital market.

RESEARCH PROBLEM

The work of content creators is central in this scenario, because they involve influencer marketing, digital consumer and social media. Based on the challenges and opportunities to be addressed in this proposal, the ongoing research seeks to answer the following question: what is the role of digital influencers in consumer purchasing decisions in a data-driven era?

OBJECTIVES

Based on the challenges and opportunities to be overcome in this work proposal from #Labtec_, the goal is research how digital influencers impact the purchasing decision process by steering consumer choices. Then, the aim is to identify the main factors that lead consumers to trust digital influencers, as well as to investigate how engagement metrics, such as likes, comments, shares, and viewing time, influence data collection in the digital environment.

METHODOLOGY

The methodological approach of this interdisciplinary study establishes a qualitative discussion on the

technical-scientific merits, attentive to the essay format as “something that is presented because it cannot be explained, to reveal its complexities” (Canclini, 2021, p. 31). This essayistic approach highlights the selection criteria and effective methodological rigor in the production of contemporary knowledge with dynamic technological strategies, guided by the production of subjectivity. An essay allows for experimentation, testing, and verification.

From a theoretical perspective, a line of contemporary studies (Hui, 2020; Quintarelli, 2019). is a strategy for updating and/or innovation. The contemporary is involved with innovation, as can be seen at #Labtec_.

We also observe potential situations, including contemporary challenges to be overcome. This highlights technological production based on the professional training consolidated by #Labtec.

DIGITAL CONSUMER

The digital consumer emerges as an active agent in the virtual environment, using digital platforms not only as a place to buy but also as a source for researching, comparing, and evaluating products and services. Therefore, platforms such as marketplaces become an important source of information about products, brands, and services when considering strategic practices.

Nowadays, the profile of the digital consumer is characterized by autonomy in browsing and variation across platforms during the decision-making process. This profile seeks convenience and values experiences shared by other consumers on social media.

Consequently, the purchasing behavior of the digital consumer is influenced by a series of emotional, cognitive, social, and cultural factors. These factors have driven consumption actions by repositioning the brand. The trust invested in digital influencers and identification with their lifestyle has a great impact on purchasing decisions. In other words, consumer attitudes are shaped according to trends that constantly emerge.

Studies indicate that consumers tend to trust influencer recommendations more than traditional advertisements (Fabre, Santos and Ibiapina, 2025). Influencer marketing can be interpreted as an evolution of traditional marketing, having its adaptation within the digital environment and enhanced by social networks. By hiring content creators with authority in specific niches, brands offer promotion of their products and services in a more organic and targeted way, using narratives that awaken and

alternative identification with the public. According to Jung (2015), influencer marketing is based on achievements and the close relationship built between influencers and followers, without being noticed.

From a conceptual perspective, digital consumer behavior can be understood by the five (5) A's of Marketing model (Kotler, Kartajaya, and Setiawan, 2017) (see fig. 2):

Figure 2: The five (5) A's of Marketing



- In A1 (awareness), the consumer becomes aware of the brand, product, or service. Thus, to get to know requires coming closer, building trust, and consequently, consuming.
- In A2 (appeal), the client feels drawn in and wants to seek more information about a particular product. There is a chance for this client to look for further details, based on their interest.
- In A3 (ask), the prospective buyer begins to research or ask family and acquaintances about the brand, product, or service that caught their attention. This is a way to research and deepen their understanding of what they intend to consume.
- In A4 (act), the consumer is determined to purchase that product. Therefore, the consumer recognizes that the product meets their needs and proceeds with the purchase.
- Finally, A5 (advocacy) occurs with customer loyalty, when they recommend the brand to friends, acquaintances, and family. They become a brand advocate by recommending it on social media.

The rise of the digital consumer brings a significant change to the current market, as the power of purchase decision-making is no longer solely in the hands of brands, but also in the hands of the users themselves. The five (5) As of marketing model (Kotler, Kartajaya and Setiawan, 2017) is relevant to understanding this journey, as it describes the consumer's path in making online purchase decisions. However, considering the dynamic nature of digital platforms, it is evident that this process is not simple, but involves continuous interactions with various social, cultural and technological elements.

The predominant presence of social networks in daily life increases consumers' ability to research, compare and evaluate, making them value not only the product or service itself, but also the experience reported by other users. In this context, influencer marketing is directly linked to promotion, and not to

the engagement created between content creators and their followers.

Technological progress in digital platforms is also a significant element, as it expands the analytical dimension of this procedure. Data collection and analysis tools enable the identification of behavioral patterns, interests, and opportunities, making advertising campaigns more efficient and based on concrete evidence.

The consolidation of platforms such as Instagram, Facebook, and TikTok has functioned as relevant tools for collecting and analyzing consumer data, driven by technological advances and the growing popularity of social networks. Interactions in digital environments are transformed into valuable data, as they allow for the identification of behavioral patterns and consumption trends. This procedure allows brands to choose influencers with greater practical foundation, making their advertising campaigns and marketing strategies more precise and efficient.

DISCUSSION AND RESULT

With technological advancements, social media has become a channel for information gathering. User interaction with these platforms generates relevant data for analyzing consumer behavior patterns and preferences. This allows brands to choose appropriate influencers for their target audience and improve reach with more accurate information.

Digital influencers are well-known public figures who are prominent on social media, especially Instagram, Facebook, TikTok, and YouTube. Content creators must maintain the connection between the brand and the consumer. They play an influential role and persuade users, having a significant impact on consumer purchasing decisions.

As a result, persuasion on social media is enhanced by algorithms that prioritize engagement, relevance, and sharing. The main influences are credibility, authenticity of discourse, proximity to the audience, and the ability to generate identification.

FINAL CONSIDERATIONS

The use of digital platforms and social media has transformed consumer behavior. Influencer Marketing, Digital Consumer, and Social Media are strategic dynamics of the contemporary world. And #Labtec_ offers digital practices on this.

It makes the consumer more informed, active, and influenced by social, cultural, and emotional factors. In this case, their direct influence on purchasing decisions reinforces the dynamic connections of influencer marketing as an effective strategy based on identification with the audience.

REFERENCES

1. Canclini, N. G. (2021). *Cidadãos substituídos por algoritmos*. São Paulo: Edusp.
2. Fabre, H. J.; Santos, L. A.V.; Ibiapina, I. R. P. A. (2025). influência dos influenciadores digitais nas decisões de compra dos consumidores. *Revista Acadêmica da Lusofonia*, [S. l.], 2 (9), 1–19.
3. Hui, Y (2020). *Tecnodiversidades*. São Paulo: Ubu.
4. Jung, L. (2015) What is influencer marketing (in layman's terms). *The Shelf*.
5. Kotler, P.; Kartajaya H.; Setiawan I. (2017). *Marketing 4.0: do tradicional ao digital*. Rio de Janeiro: Sextante.
6. Kotler, P.; Keller, K. L. (2006). *Administração de marketing*. 12. ed. São Paulo: Pearson.
7. Prado, L. Á.; FrogerI, R. F. (2019). Marketing de influência: um novo caminho para o Marketing por meio dos Digital Influencers. *Interação – Revista de Ensino, Pesquisa e Extensão*, [S. l.], (19) 2, 43–58.
8. Quintarelli, S. (2019). *Instruções para um futuro imaterial*. São Paulo: Elefante.

AI-Generated Content and Its Impact on Brand Credibility

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ABSTRACT

This paper aims to gain understanding on AI Generated content and its brand credibility, specifically focusing on 5 central themes: Consumers' perception and trust, authenticity and human touch in content, ethical complexities faced by companies, consistency in content along with coming up with a balance between creativity and automation.

AI provides us with a way to make content creation efficient and scalable in a way quite unlike before but it also poses the threat and very real concern of trust, authenticity and ethical dilemmas. This paper draws upon a literature review of available articles, business cases and case studies, to give a complete idea of the dangers of AI in Marketing.

The study reveals that although AI can be used to improve efficiency in working, relying on it too much without using human insights can negatively effect consumer trust.

INTRODUCTION

AI is used in almost every field and this is a fact one cannot deny. Companies use AI for generating art, for automating software, for creating videos and in many more aspects. Brands leverage all of this to produce marketing materials and campaigns in a more effective manner. In this fast-paced economy, the ease of AI generated content makes it quite appealing to a large majority of businesses. Though AI generated content is quite effective in improving the brand's outreach by easing the process of creating campaigns, it is also a threat to brand credibility. Brand credibility refers to the degree to which consumers consider a company to be authentic and trust worthy. The entire business of a brand depends

on how credible it is able to portray itself as. Brands that use more and more AI seem to have lesser control on their brand image, and seem to lose credibility and gain the reputation of being impersonal, manipulative or amateurish.

There are five overall themes discussed in this paper. First, we look into consumer perception and trust toward AI-generated brand content, in relation to how exposure and familiarity towards AI use influences someone to engage with the content. Second, we discuss the importance of authenticity and human touch in relation to keeping a personal brand voice with their messaging. Third, there is transparency and ethical dilemmas discussed in terms of bias and accountability. Fourth, there is AI usage in relation to reputation management and maintaining consistency in your content. Finally, the idea of striking a balance relates to human imagination and automation, in terms of using the capacities of AI while leaving room for human creativity and human touch.

All these themes present a foundation for comprehension regarding the opportunities and dangers of AI-generated content and how it impacts brand credibility.

CONSUMER TRUST AND PERCEPTION OF AI GENERATED BRAND CONTENT

While a lot of us love to use AI in our day-to-day life and work or education, it is not as well received in marketing or brands. People perceive AI as a threat that could potentially take away jobs and opportunities from humans and in reality, is already in the process of doing so.

Brands that use AI seem to have received heavy backlash over its inauthenticity and their choice of taking the easier and cheaper way out over original human art. Many audiences seem to be hesitant to engage with content generated by AI, often perceiving it as impersonal, manipulative, or lacking the emotional depth of human creativity.

Studies have shown that content created by AI consistently scored drastically lower than content created by the respondents on all factors and that consumers tend to trust brands less when they discover that AI was involved in creating promotional messages or artwork (ResearchGate, 2025).

A very recent AI trend that took the internet by storm was the AI art generated Ghibli art trend. “Ghibli art is the distinct, hand-drawn animation style of Japan's Studio Ghibli, characterized by detailed, lush landscapes, expressive characters, soft colour palettes, and a blend of realism with magical, whimsical

elements” (WebMatriks, 2025). Millions of users across the internet used this popular AI art prompt to generate ghibli-fied versions of their personal pictures. While a lot of users loved and delighted over the trend, it raised a lot more backlash from other netizens who felt that this devalues the hard work and artistry of actual humans who work hard to draw art. Critics believed it was also disrespectful to Hayao Miyazaki, the co-founder of Studio Ghibli and other artists who worked years to create the art that AI creates in seconds. The author himself stated AI-generated animation was an "insult to life itself" (NDTVWorld, 2025).

Similarly, many companies have been called out for their preference over the usage of AI instead of employing real humans. Emotional connection is a crucial element in brand loyalty, it is not possible to achieve that when content is automated and lack originality. As AI becomes central to how brands engage customers from personalization engines to chatbots - measuring consumer trust in these systems is no longer optional. It's essential. After all, as a brand if you prefer the cheaper, soulless shortcuts with no originality of their own, how can your customers expect you to be original with your products or clients?

However, not all reactions are negative. The younger audience is more open to AI driven content. Transparency also helps. When brands are more open and honest about their use of AI, audiences are more forgiving and even curious about the technology. "Effectively communicating how AI is being used- whether it is for ad targeting or content development will aide in building trust." Equally importantly is that companies have to make sure that the AI systems they are investing in are culturally relevant, reflecting authentically, and engaging the diverse audiences the brand serves. (Forbes, 2025). Brands that use AI as an enhancement and assistive tool rather than a replacement for human creative ingenuity are the ones that can balance authenticity and innovation. The goal with AI use should be to foster a connection with the audiences, while balancing some of the new latest technologies.

AUTHENTICITY AND HUMAN TOUCH IN BRAND COMMUNICATION

Lack of human emotions or storytelling in AI- generated content can greatly affect a brand's voice, relatability and genuineness. Today, where everything is generated by AI, authenticity is highly desired and valued among audience. Amid the pool of algorithmically generated content, messages crafted by real people stand out- not just for what they say, but for how they make us feel. Given the growing prevalence of bite-sized, fast-paced content, and increasingly short attention spans, personalized, human messaging has the ability to pierce through the noise to create a deeper connection. (LBB, 2025)

Authenticity is in fact built on trust, which is required for loyalty, both of which are critical to sustain brand success. (Deloitte, 2024). Human centred storytelling, narration and cultural connection helps brands form a deeper and meaningful connection with customers. So, when AI takes over these things that allow us to connect, it ends up feeling soulless. AI has become super advanced and can replace style, tone and even humour yet it will never be the same as an imperfect human being. Customers would usually choose an imperfect, raw energy over a pristine and cold one. AI does not come close to the authentic lived experience, wisdom, mistakes, teachable moments, and emotions that a person has. Human beings inherently possess an emotional layer that takes storytelling and communication to the next level. Ultimately, the heart of storytelling has been eliminated. AI can mimic communication; it cannot replicate empathy. Empathy, the ability to understand others and human emotions is what gives conversations depth.

Moreover, authenticity plays hand in hand with voice and cultural empathy. For example, a brand like Apple's concept revolves around "Empowering, individuality and forward thinking" while Dove's campaign emphasizes self-acceptance and inclusivity. These concepts are not merely just words, they stem from deep cultural understanding and personal lived experiences of people. Using these experiences in their brand image creates a connection on a different level with their audience who empathise with it. These cultural or emotional cues cannot be replicated by AI- generated aesthetics. A tiny, misaligned tone or joke may backfire or be misinterpreted and taken as an offense, which could result in the brand resulting in major backlash. Recently, Deloitte- a famous global professional services firm was ordered to pay a refund of \$440,000 consultancy fee to the Australian government after their report that they delivered, which included AI- generated content contained some serious errors. Deloitte acknowledged that it used a generative AI model during early drafting (NDTV, 2025). Deloitte faced a lot of scrutiny from netizens regarding the matter. An unnamed ex- employee on Instagram even joked saying "employing me might have been costlier but at least I wouldn't have made that mistake".

That said, AI can still play a supportive role in brand communication when used strategically smartly. AI can be an effective way to augment human creativity instead of outright replacing it. Take, for example, how predictive analytics and sentiment analysis help marketers to understand consumer behaviour and refine their messaging. AI could flag when posts should be made to maximize engagement, provide analysis on engagement rates before and after posting, or discover trending topics. The human teams could then work from this data to create emotionally intelligent narratives that respectfully represent real values. When AI handles the technical aspects and humans focus on empathy and meaning, the result is a balanced and credible brand voice. A person on the internet once said, "I want AI to do my laundry and

chores for me so I can focus on my art, not do my art for me so I have to do the chores and laundry”.

That said, with the right ways and motives we can still use AI to support us with brand communication when used smartly. Instead of having it completely replace humans and their jobs, we can use it to enhance our colors. There has been a rise in so many new AI assisted tools that help marketers to understand customer needs and behavior. For example, AI can suggest the best posting time, analyze engagement and find the best trending topics based on algorithms. Creators use these analytics to create content and stories that emotionally connects with audience and represent true values. When we let AI handle the techy aspect, humans can focus on the emotions and storytelling and together we can create the unstoppable. A person on the internet once said, “I want AI to do my laundry and chores for me so I can focus on my art, not do my art for me so I have to do the chores and laundry”. A lot of people highly associate AI with job displacement.

In the long run, authenticity in brand communication is not only about completely rejecting AI like the boomers and living like cavemen (just joking), but more about redefining how technology and humanity can coexist. As AI continues to evolve, brands must ensure that their strategies and creativity remain grounded and not out of touch. The future of credible brand storytelling will depend on the ability to combine algorithmic intelligence with emotional intelligence. AI can analyse, predict, and generate but only humans can inspire, connect, and care.

ETHICAL CHALLENGES AND TRANSPARENCY IN AI BRANDING

The growing use of AI content in advertising raises some serious ethical concerns which could easily devalue brand trust if not dealt with. Algorithmic bias is perhaps the most important one of such concern. When biased or representative data are used to train AI algorithms, the same bias may be reiterated and even amplified in the outcome. Which means if data portraying a certain ethnicity in a negative light, using the model to research the same ethnicity will give an even worse image of the ethnicity. As per AI Ethics: Integrating Transparency, Fairness, and Privacy in AI Development (2023), diversified data sets and fair algorithms are needed to reduce such risks (AI Ethics, 2023).

Misinformation is another such concern. AI programs can be easily misused to create false or misleading information that quickly gains momentum on the internet, destroying consumer trust and brand reputation in a jiffy. The same study indicates towards the need to uphold human accountability for AI content for accurate determination of accuracy and authenticity.

Transparency and disclosure are the key towards the ethical use of AI in branding. Consumers today would want brands to be transparent regarding how the AI system processes data and creates content and handles individual data. AI Ethics: Embedding Transparency, Fairness, and Privacy in AI Design (2023) says explainability and transparency are the essence of ethical AI systems. In advertising, this would mean labeling AI-generated contents openly, openness in announcing when personalization is done, and openness regarding levels of human intervention.

Transparency and consumer control over data can instill trust and brand loyalty, argues A'yun and Setyaningsih (2024). If companies are not transparent about how they are utilizing AI tools, customers understand this as to be dishonest or manipulative. Such dishonesty will trigger doubt, distrust, and reputation loss in the future. Transparency in AI usage is therefore an ethical requirement as well as a strategic benefit that constructs stronger consumer relationships.

Regulatory contexts and ethical codes corresponding to AI execution in brand marketing are evolving to matters of fairness, accountability, and privacy. Kumar and Suthar (2023) also claim that laws, including, those of the European Union's AI Act and OECD AI Principles, allow companies to keep human involvement, transparency, and data protection in automated processes.

Best practices to be established based on current research are those involving the use of fairness-aware algorithms, regular audits of output from AI, and involving diverse teams in AI development. Hermann (2021) also requires that there must be interpretable AI models through which the marketers will be in a position to justify their actions and offer transparency to customers. Furthermore, business institutions can utilize utilitarian controls such as releasing AI usage statements, providing terms of consent to data, and having ethics review committees in place.

By displaying this behavior around these evolving standards, brands can become voices for efficiency and creativity as well as for moral decency. Self-regulation and transparency put brands in the correct side of history, that of admired, ethical pioneers of the AI age of advertising.

THE ROLE OF AI IN CONTENT CONSISTENCY AND REPUTATION MANAGEMENT

Having a consistent voice everywhere has always been the testament to credibility, and now AI technologies are more at the forefront of creating that consistency. According to Komara and Juhana (2024), AI-generated content enables brands to have the same tone of voice, visual brand identity, and

messaging on all their social media and marketing channels. Their research discovered that AI platforms can review previous campaigns, learn the linguistic styles of a brand, and reproduce those aspects in subsequent content, so the brand voice is consistent and recognizable online.

Similar AI tools such as large-language models and computer-aided design technology can also identify inconsistency or deviation from brand standards. According to Deryl (2023), automation is a better approach for brand governance, which enables real-time quality control. Moreover, academic literature on branding also supports this perspective. According to Frontify (2025) in its guide on "AI for Brand Management," "A brand governance software with AI will be able to monitor content compliance, which will then generate an alert if there are any differences in content or visuals before being published." Moreover, MarketingProfs (2023) states that "Generative AI is flexible but only has one voice when combined with clean brand parameters." Therefore, if applied strategically, AI will help improve the accuracy and consistency of messages that enforce a constant presence for a brand across geographies, languages, and media.

Apart from consistency, AI is also being increasingly applied for brand reputation management by leveraging sophisticated monitoring and sentiment analysis tools. According to Aleryani (2024), "AI will monitor massive volumes of social media, news, and reviews to monitor what people are saying about a brand in real-time." Moreover, "Using AI, an organization will be able to manage its digital reputation to a greater degree because it will be able to pick up on subtle signals of trouble sooner rather than later, well before it gets to crisis and beyond." Moreover, by applying a more proactive approach to manage a brand's reputation, an additional degree of comfort is also attainable, i.e., that a brand will be viewed as being trustworthy and transparent in a competitive marketplace.

In a similar vein, InMoment's "AI for Reputation Management" report (2025) suggests that sentiment analysis models will potentially identify subtle consumer emotions, which will further help marketing teams react accordingly. Similarly, "ScaleFlex" (2025) explains how "Visual AI" technology is employed to assess images related to a brand, including web images, to monitor instances of unauthorized content that hurt a brand's reputation. These technologies help brands engage with their audience in an effective manner while also being mindful of positive consumer sentiments and misinformation. From an overarching perspective, academic and related literature clearly indicate that there is a potential for AI's "analytic ability" to help brands monitor consumer sentiments not only on public platforms but also advise on how to manage their digital presence across a range of online platforms.

While there is potential for AI tools to offer some benefits with regard to brand consistency and monitoring, there are some complications that might hurt a brand's credibility if not managed well. As Komara and Juhana (2024) say, hyper-automation can actually sever the human connection in communications, with the tone perhaps becoming more robotic or generic; this generic or robotic tone can limit emotional connections to consumers, especially when emotional or authentic communications are the basis of consumer connectivity and brand loyalty. Deryl (2023) adds that if an organization relies solely on AI, it limits the brand's personality to an "algorithmic rigidity" that is unable to respond to or be creative about new or unpredictable events.

Further, data ethics and privacy represent an acute problem. Consumer data drives these AI-powered monitoring systems, and deficiency of perceived transparency and compliance with regulations, especially in regard to GDPR and the future EU AI Act will undermine the same consumer's trust. Aleryani (2024) advocates for ethical underpinnings developed to protect consumers against the limits of their data potentially being abused, and against algorithmic bias used in sentiment analysis. Additionally, MarketingProfs (2023) cautions that poorly trained algorithms or misinterpretation of tone may result in incorrect judgments regarding audience sentiment, leading to suboptimal decisions.

Consequently, while AI provides efficiency and accuracy, and has the potential to enhance human opinion and credibility management in reputation management, human oversight will always be needed.

BALANCING AUTOMATION AND HUMAN CREATIVITY IN BRAND STRATEGY

The application of artificial intelligence (AI) in brand planning has transformed advertising by introducing unprecedented efficiency and accuracy. Chintalapati and Pandey (2021) are of the view that AI conducts activities like customer segmentation, personalized recommendations, and predictability analysis to allow brands to communicate personalized messages in high quantities. Automated systems efficiently process customer information, which translates to knowledge that allows marketers to attain optimal timing, tone, and content applicability. This has made it possible for businesses to have a uniform and fact-based brand voice across various online platforms.

Automation also optimizes effectiveness through the freeing up of human marketers from repetitive operation work to concentrate on strategic imagination (Şen Bayram & Şencan, 2025). The ability of AI to handle large volumes of unstructured data simplifies decision-making and makes it easier for brands to predict customers' needs. Park, Kim, and Lee (2025) also point out that large language models (LLMs)

are great cognitive tools in the field of creativity through ideation prompt generation, campaign frameworks, and first drafts that can be perfected by human marketers. From this, automation is not only displacing people, it enriches creative work by enabling ideation, minimizing human error, and providing consistency in delivery.

Despite its strengths, AI is lacking when it comes to mimicking human creativity and emotional appeal. Zhou and Lee (2024) argue that since AI can only replicate, it may be able to copy tone and style but will never be able to recreate real human sensitivity and creativity, leading to bland, emotionless communication.

Also, Şen Bayram & Şencan (2025) quote that "creativity is not only about the coming together of ideas, but also about empathy, moral thinking, and cultural sensitivity." These are uniquely human capabilities that help a marketer develop a story that resonates with specific target audiences and settings. Too much reliance on automation could result in a form of content that is non-diverse, with no originality of thought or feeling. According to Artificial Intelligence Review (2022), "when artificial intelligence is applied in any form of creativity, there will inevitably be questions about authorship, originality, and significance, which are at the heart of brand identity." Automation, therefore, might bring some form of productivity but will not be able to substitute emotional intelligence and cultural sensitivity that are required for genuine brand storytelling.

In order to address both aspects, i.e., human and authenticity, many researchers propose a hybrid approach that includes a combination of the "pattern-making" capabilities of AI with a human's "creative intuition." Park et al. (2025) refer to this as "augmented creativity," where the AI aids ideation by enhancing rather than replacing human ideation. In such a broad sense, the AI would provide data-centric intelligence and creative scaffolding, while the human brings confidence, emotional insight, moral judgment, and intent to consumer aspirations. Combined, it offers brands operational excellence, while maintaining human examples.

Chintalapati and Pandey (2021) state that as a co-creator, AI has the possible ability to enhance marketing creativity through its skill of generating ideas and providing immediate insights into consumers. However, human thinking must still be leveraged to embed cultural appropriateness and sensitivity in the decisions made by AI. Zhou and Lee (2024) reach a similar conclusion, but they expand on the potential of hybrid creative systems by suggesting that the human creative process is "human-in-the-loop" design planning whereby human creatives evaluate, improve and situate AI output in a way that sustains credibility to

artistic integrity and ethics. In conclusion, Artificial Intelligence Review (2022) captures the argument by suggesting, we believe the future of the most sustainable brand imagination is in this practical collaborative whole or as an assistant to human creativity and not as a replacement.

Through the framing of collaborative ecosystems, brands are leveraging the power of AI, while also remaining contemporary and originality-centered, as these are the bases behind longer-lasting credibility, trust and curiosity, ultimately creating deeper relationships with consumers.

DISCUSSION

Transparency and customer trust are intimately related; research indicates that customers distrust outputs from an AI that lacks transparency (A'yun & Setyaningsih, 2024). It is known that although AI can produce generically "authentic" content, it is seldom able to capture the emotional intensity one needs when developing a bond (Zhou & Lee, 2024; Şen Bayram & Şencan, 2025). There also persists an ethics threat in terms of bias, disinformation, and accountability, and a need for disclosure and ethical behavior (AI Ethics, 2023; Komara & Juhana, 2024). The automated application of AI to produce uniform content and branding identifies operational efficiencies connected to providing the value of real-time monitoring, sentiment analyses, and tracking the brand tone of the messaging used during the trial across any account (Aleryani, 2024; Deryl, 2023). Finally, it will be important to balance the automation functions with human creativity- AI maximizes productivity, but some level of humanity is required to maintain emotional connections built from engaging with individuals and facilitating opportunities and conversations (Park et al., 2025; Artificial Intelligence Review, 2022).

Brands that use AI must consider a dual approach: automation for productivity and protecting authenticity and trust. Being transparent about AI disclosure will lessen the risk of consumer revolt and damage to their reputation. Enabling brand voice consistency across AI solutions builds credibility, especially when cross-country or cross-channel initiatives are involved. Ethical governance, such as reducing bias and accountability strategies, will help establish readiness for future regulation and consumer expectation. Lastly, a human-AI collaborative strategy equips marketing professionals to match data insight with cultural and emotional intelligence to create content that resonates genuinely. Strategically, it puts brands in a position to scale activities, sustain engagement, and safeguard reputation without relinquishing the emotional engagement that fuels loyalty.

The future directions indicate that branding will integrate more with AI. The generative AI will improve

its ability to generate more sensitive and emotional content. The explainability of AI solutions will improve. Brands will make algorithmic decisions transparent and thus regain their audience's trust. AI will improve real-time sentiment analysis and reputation management. The solutions will become normalized, and brands will prevent crises. There will be a proliferation of global regulations and ethics frameworks for AI. Brands will have to establish standards of disclosure, fairness, and accountability while transacting in digital environments. Finally, there will be hybrid human and AI models. AI will improve processes, and human creativity will validate authentic messaging.

RECOMMENDATIONS

1. To ensure that the AI complements the brand personality seamlessly, brands need to plan to implement the AI tools with care and consideration, beginning with pilot programs, using the best practices, developing a universal platform, increasing efficiency, improving processes, and without compromising control over creativity. It is also essential to regularly review the content produced by the AI tools to ensure accuracy, absence of bias, and consistency before publishing the content. Educating employees about the capabilities of AI tools will help build an innovative culture of responsibility, ensuring successful implementation of AI tools in the business processes of the brands. By using performance measures, consumer research, and other tools in the AI process, brands can improve the quality, consistency, and credibility of the content produced.
2. To build responsible processes, brands need to consider labeling all the content produced by the AI tools, obtaining consumer consent, ensuring non-bias, developing internal committees to ensure adherence to the principles of responsible use of AI tools, ensuring algorithmic accountability, ensuring the output of the algorithm is compatible with the culture of the company, being transparent with consumers, labeling all AI-generated content, and ensuring continuous human oversight of the processes, among other fundamentals, to ensure accountability and build trust with consumers, thereby reducing reputational risk associated with the use of AI tools in the business processes of the brands.
3. Hybrid models that combine the efficiency of AI with human imagination need to be developed. This will allow humans to concentrate on emotional resonance, storytelling, and cultural context, while AI can be used for data analysis, standardization of content, and repetitive tasks. This will allow for optimal collaboration that will enable maximum creativity with operational scale. Feedback loops will be used for continuous interaction with human teams and AI systems to align brand voice with authenticity.

CONCLUSION

This research has shown that the use of AI in content plays a huge role in influencing brand credibility across five major areas, namely consumer trust, authenticity, ethics, consistency of content, and balance of creativity with automation. Consumers want to know about the involvement of AI, which makes transparency a major component for building trust in the system. Although efficiency, consistency, and real-time reputation management have been enhanced with the use of AI, it cannot create the emotional depth needed for the establishment of authentic relationships. Ethical issues, such as bias, misinformation, and accountability, will be major issues that need to be addressed with a combination of guidelines and self-regulation. Hybrid approaches that combine the efficiency of AI with human discretion will enable brands to achieve maximum productivity while still being creative, culturally sensitive, and emotionally appealing. The strategic application of AI, with ethics at the core, will enable brands to achieve maximum efficiency, create brand trustworthiness, customer loyalty, and remain relevant in a more automated marketing environment.

REFERENCES

1. Espiritu, K. A. T., Lopez, R. M., Salagubang, G. N. M., & Olazo, D. B. (2025). *Comparing consumer perception between AI-generated content (AIGC) and human-designed digital marketing materials among consumers in the Philippines*. *Journal of Global Business*, 14(1). https://www.researchgate.net/publication/392768595_Comparing_Consumer_Perception_Between_AI-Generated_Content_AIGC_and_Human_Designed_Digital_Marketing_Materials_Among_Consumers_in_the_Philippines
2. Alexander, N. (2025, August 26). Consumer trust and perception of AI in marketing. *Search Engine Journal*. <https://www.searchenginejournal.com/consumer-trust-and-perception-of-ai-in-marketing/553598/>
3. WebMatriks. (2025, April 5). What is Ghibli art and how brands use Ghibli-inspired art for traffic & engagement. *WebMatriks Blog*. <https://www.webmatriks.com/blog/what-is-ghibli-art-and-how-brands-use-ghibli-inspired-art-for-traffic-engagement/>
4. NDTV News Desk. (2025, March 27). “Insult to life itself”: Ghibli founder Hayao Miyazaki on AI-generated art. *NDTV*. <https://www.ndtv.com/world-news/quot-i-would-never-incorporate-this-quot-what-studio-ghibli-039-s-hayao-miyazaki-once-said-about-ai-animation-8021037>
5. Drenik, G. (2025, January 14). 55 % of audiences are uncomfortable with AI — are brands listening? *Forbes*. <https://www.forbes.com/sites/garydrenik/2025/01/14/55-of-audiences-are-uncomfortable-with-ai-are-brands-listening/>

6. Beko. (2025, October 17). The human touch: Why authenticity wins in an AI world. *LBB Online*. <https://www.lbbonline.com/news/beko-artificial-intelligence-ai-playbook-marketing-human-touch>
7. AskAttest. (n.d.). Brand identity examples. *AskAttest Blog*. <https://www.askattest.com/blog/articles/brand-identity-examples>
8. NDTV News Desk. (2025). Deloitte's AI fallout explained — the 440,000-report that backfired. *NDTV*. <https://www.ndtv.com/world-news/deloittes-ai-fallout-explained-the-440-000-report-that-backfired-9417098>
9. A'yun, A. Q., & Setyaningsih, W. (2024). Consumer empowerment through ethical AI: Strategies for transparent and trustworthy personalized marketing. *Journal of Marketing and Business*, 5(2). Retrieved from <https://generatedp.com/index.php/jmb/article/view/41>
10. AI Ethics: Integrating Transparency, Fairness, and Privacy in AI Development. (2023). Directory of Open Access Journals (DOAJ). Retrieved from <https://doaj.org/article/54566e9103a04305b7852261d26948ca>
11. Hermann, E. (2021). Leveraging artificial intelligence in marketing for social good—An ethical perspective. *Journal of Business Ethics*, 174(3), 549–564. <https://doi.org/10.1007/s10551-021-04843-y>
12. Kumar, D., & Suthar, N. (2023). Ethical and legal challenges of AI in marketing: An exploration of solutions. Retrieved from <https://ouci.dntb.gov.ua/en/works/735db0X1>
13. Zhao, Y. (2024). An examination of ethical challenges in the application of AI in marketing. *International Journal of Business and Management*, 19(1). Retrieved from <https://ccsenet.org/journal/index.php/ijbm/article/view/0/51849>
14. Aleryani, A. Y. (2024). Leveraging AI to enhance organizations' digital reputation for sustainable development. *International Journal of Recent Engineering Science*, 11(5), 185–192. <https://ijresonline.com/archives/ijres-v11i5p118>
15. Deryl, M. D. S. (2023). How does AI drive branding? Towards an integrated framework for AI mechanisms in building sustainable brand environments. *Journal of Brand Management*, 30(4), 345–361. <https://doi.org/10.1016/j.jbm.2023.09.002>
16. Komara, I., & Juhana, A. (2024). The effect of AI-generated content on brand identity consistency in social media: A systematic literature review. *Journal of Marketing & Artificial Intelligence*, 3(1). <https://ejournal.upi.edu/index.php/JMAI/article/view/78626>
17. Frontify. (2025). AI for brand management: Governance, consistency & scale. <https://www.frontify.com/en/guide/ai-for-brand-management>
18. InMoment. (2025). AI for reputation management: Benefits, use cases, and considerations. <https://inmoment.com/blog/ai-for-reputation-management>

19. MarketingProfs. (2023). Brand consistency in the age of AI: A guide for marketers. <https://www.marketingprofs.com/articles/2023/50100/brand-consistency-guide-in-the-ai-age>
20. ScaleFlex. (2025). AI reputation management: Protect and strengthen your brand with Visual AI. <https://blog.scaleflex.com/ai-reputation-management-for-your-brand-with-visual-ai>
21. Artificial intelligence in the creative industries: A review. (2022). *Artificial Intelligence Review*, 55(3), 589–656. <https://doi.org/10.1007/s10462-021-10039-7>
22. Chintalapati, S., & Pandey, S. K. (2021). Artificial intelligence in marketing: A systematic literature review. *International Journal of Market Research*, 63(1), 38-68. <https://doi.org/10.1177/14707853211018428>
23. Park, J.-H., Kim, S.-J., & Lee, S.-T. (2025). AI and creativity in entrepreneurship education: A systematic review of LLM applications. *AI*, 6(5), 100. <https://doi.org/10.3390/ai6050100>
24. Şen Bayram, A. K., & Şencan, İ. (2025). An AI-infused creativity framework for human-AI interaction. *International Journal of Mardin Studies*, 6(1), 36-54. <https://doi.org/10.63046/ijms.1673173>
25. Zhou, E., & Lee, D. (2024). Generative artificial intelligence, human creativity, and art. *PNAS Nexus*, 3(3), pgae052. <https://doi.org/10.1093/pnasnexus/pgae052>

The Future of Corporate Financial Reporting: Can Automation Replace Accountants?

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ABSTRACT

This paper explores the impact of automation and artificial intelligence on the financial reporting function and whether it can replace human accountants. With RPA, machine learning, blockchain, AI, and predictive analytics, the accounting and finance function is undergoing a digital transformation that is enabling financial reporting to be more accurate, reliable, and faster. However, there are limits to the use of automation, including ethics, data quality, cyber security, and the loss of human agency. By doing analyses of academic and professional literature and of industry case studies from Deloitte, PwC, KPMG, SAP, and Oracle, this paper investigates where automation can and cannot apply to financial reports. While automation works efficiently and promotes transparency and compliance, it must not replace humans who reason, judge ethically and are aware of context. Accountants remain as the interpreters and ethical stewards of technology, with the future of financial reporting as a joint human-machine future.

Keywords: Automation, Artificial Intelligence, Financial Reporting, Accountancy, Data Analytics, Ethics

INTRODUCTION

Financial reporting is perhaps the most defining characteristic of modern business accountability, and it is at the very center of the profession, which has always depended heavily on human decisions and manual interventions. It is also central to a wide mixed stakeholder ecosystem that includes investors, regulators, and other stakeholders. These issues and the complexities of the business environment and the increasing amount of information to be processed have been factors in the increasing use of technology to improve the quality, speed and transparency of business financial reporting. Technology has transformed the accounting profession from bookkeeping to the analysis and decision making processes.

The use of smart systems while accounting has been in debate, with the benefits being increased productivity, efficient work and eliminating tedious tasks. However, some questioned whether this trust in the algorithm could risk the accountability, contextual awareness or professional skepticism that have been hallmarks of the accounting profession for centuries. The analysis shows that automation can improve efficiency and reduce inaccuracies, but it cannot replace the human elements of intuition, ethics, and long-term planned thinking. Automation is seen as a tool to help accountants move from being human processors of data to human analytical thinkers.

EVOLUTION OF CORPORATE FINANCIAL REPORTING

The history of accounting has developed in parallel to the different ways of organizing businesses over the centuries. In its earliest form, it required all bookkeeping to be performed manually, and each individual transaction to be recorded. Although the Industrial Revolution and mechanical calculators allowed accounting to scale in new ways, it still was a manual process. Digital spreadsheets for personal computers, such as Microsoft Excel, allowed accountants to calculate faster, but still required them to input, interpret and check every number.

The twenty-first century has seen the arrival of automated accounting software and artificial intelligence accounting software. Cloud computing and Enterprise Resource Planning (ERP) software such as SAP, Oracle Financials and NetSuite bring accounting to other departments using real time data and reduce the need for manual reconciliation. Machine learning algorithms can extract data from invoices, categorize expenses, and generate financial reports in seconds, while blockchain allows records to be immutable, meaning that they cannot be changed without being noticed.

The age of the pencil and notation gave way to clever accounting, where the fastest and most accurate accountants live a digitally enabled life with predictive intelligence, treating their role less as a recording of the past and more as a forecasting of future conditions. In general, accounting has become far less of a record-based activity and more a forward-looking one. Each of these technological developments has not replaced the accountant, but rather elevated the accountant to higher levels of judgment and supervision.

EMERGENCE OF AUTOMATION AND AI TOOLS IN FINANCIAL REPORTING

The earliest financial reporting packages were low-end accounting software programs that were used mainly for bookkeeping and payroll functions. With increasing amounts of data and real-time

requirements, finance teams began adopting more advanced programs for finance reporting. One of the tools that has come up is the Robotic Process Automation (RPA), software bots that emulate human actions to execute routine and rule based transactions. They can compile bank statements, post journal entries, and produce reports at speeds and with an accuracy that exceeds those of human auditors. Large accounting firms such as Deloitte, PricewaterhouseCoopers and Ernst & Young have invested heavily in RPA to help reduce manual effort and improve consistency and quality of audits.

AI takes this a step further, incorporating cognitive abilities. Unlike RPA which follows rules-based processes, AI systems learn from patterns in data, automatically identifying anomalies and generating predictive perceptions. Some Natural Language Processing (NLP) applications like IBM Watson and ChatGPT analyze financial disclosures, decipher unstructured data, and summarize lengthy reports which go a step further than customary compilation from bookkeeping data by offering analysis and interpretation in addition to reporting in financial documents.

Blockchain improves compliance automation even further with an immutable and auditable record of transactions. Smart contracts implement more automated controls. Online accounting startups like Xero, QuickBooks, and Zoho Books are adding automated controls and compliance checks to deliver enterprise-grade accounting standards for the small business segment. These systems shift the automation process from mechanical automation to clever and self-correcting cognitive automation, or analytical automation, within the domain of financial reporting.

BENEFITS AND APPLICATIONS OF AUTOMATION IN FINANCIAL REPORTING

Apart from increased efficiency, there is an increased accuracy that comes with it. The accuracy of the data entry process is also increased by automating the financial reporting. There is also a reduced risk of errors that come about as a result of fatigue, lack of concentration, and insufficient focus. The advanced analytics, which is led by AI, greatly speeds up the reporting to improve accuracy and allow for quick perceptions to be used for decision-making. The automated consolidation tools can greatly reduce the time it takes to close books from weeks to days or even hours.

Firms can also reduce their operational costs by eliminating redundant manual processes and freeing up capital resources for strategy-focused initiatives. For example, Deloitte's implementation of automated audit tools has reduced repetitive audit tasks by almost 40 percent, allowing accountants more time to focus on identifying risk and creating advice for clients. Automated systems might ease compliance with

accounting standards via automated warnings for errors or outliers when accounting standards change, e.g. IFRS or GAAP.

Another important application of predictive analytics and financial risk assessment is forecasting opportunities. Machine learning models are used to forecast revenue, cash flow, and also flagging early signs of potential revenue loss or fraud. These skills allow accountants to provide calculated advice by interpreting data rather than simply reporting it.

In summary, automation allows the finance function to focus on timely, accurate, and good quality information. It does not replace accountants, but it does require them to drive ethical financial decisions and the story behind the numbers.

CHALLENGES AND LIMITATIONS

However, as is the case with any technology that offers this level of efficiency and precision, it is also prone to some challenges, with one of the biggest challenges being that of over-reliance. There is also the issue of technical glitches, as well as corruption and manipulation of data, for instance, through the use of wrong information, which could lead to errors on all levels of the financial statements of an organization. As the economy becomes more data-intensive, the quality of automated processes is becoming more dependent on the quality of data used. There is also the challenge of cybersecurity, which is a threat to the integrity of the automated financial system. There is a threat of hacking, data breach, and ransomware as organizations move more of their financial data to the cloud. Encryption, firewall, and security audits help to maintain financial data with integrity and confidentiality. Another problem is the ethical opacity of AI algorithms. Many ML methods are "black boxes" that provide results without an explicit rationale. This black box nature can pose difficulties for accountability purposes, particularly for regulators and auditors who may expect an explanation for each decision. Biased algorithms can also result from unrepresentative or low-quality training data.

Automation is also not well suited for the parts of an audit that require complex judgment and context sensitivity, such as determining the level of impairment of goodwill, estimating the amount of a contingent liability, estimating the fair value of an asset, etc. The cost of an automated system may be prohibitive for smaller companies, further increasing the gap.

In this way, automation must also be supported with a framework of human oversight, ethical

governance, and professional accountability in order to ensure the quality, accuracy and reliability of financial reporting.

ETHICAL, ECONOMIC, AND HUMAN IMPLICATIONS

Beyond technology-based disruptions, the rise of finance-based automation raises ethical, economic and human concerns. For example, accountants have codes of integrity, objectivity and professional skepticism they must abide by. If the machine decides, who responds? If an automated audit fails to notice a fraud or misstatement, is the operator responsible or is the machine responsible? This means algorithmic transparency and ethical auditing of AI systems are critical to maintaining trust in financial reporting.

In economic terms, automation may alter the composition of the accounting labor market, reducing demand for routine clerical and bookkeeping tasks performed by data entry clerks, and increasing demand for analytical and technical skills. According to World Economic Forum (2024) estimates, almost half of all accounting work could be automated by 2030. However, it is predicted this automation will lead to new jobs in accounting design and analysis, and advisory work, transforming the role and resulting in greater knowledge-based requirements, rather than directly replacing job roles.

From a human perspective, the accountant of the future is likely to be a hybrid worker with accounting and IT skills. Accountants of the future will need to be willing to learn on a continuous basis and understand algorithms and how to check their outputs. Accountants can transform with this technology like facilitators, ethically steward AI, and interpret data-driven perceptions rather than fall victim to this disruption.

Finally, humans can empathize, can think broadly about ethical implications, and can understand context with programming never occurring. Ultimately, the ethical accountant can continue to be the last bastion that ensures technology serves the public good.

CASE STUDIES AND INDUSTRY EXAMPLES

The best examples of automation in corporate financial reporting are found within the industry leaders. Deloitte's Omnia audit platform shows how artificial intelligence can transform the audit experience. It can process millions of transactions and identify exceptions and anomalies that are impossible to detect

without technology, allowing Deloitte auditors to allocate more resources to high-risk transactions that require human judgment.

Using machine learning techniques, PwC's "GL.ai" analyzes its clients' general ledgers for unusual trends that might signify data entry errors or potential fraud. PwC describes the tool as helping auditors make data-based decisions, rather than replacing them altogether. For KPMG's natural language processing tools, contracts get scanned regarding inconsistencies in revenue recognition, helping clients lessen compliance risks and streamline the audit process.

Enterprise platforms like SAP S/4HANA and Oracle Financial Cloud automate the reporting, budgeting and forecasting processes and automatically generate dashboards that measure KPIs for executives at any time. This lessens lag from executing processes to making decisions, allowing timely adjustments to strategy. Startups such as DataRails and Fathom consolidated lower-cost data and modeled scenarios for small and medium-sized businesses, thus democratizing automation even further.

Generally, these cases illustrate automation works the best when people judge. Firms can create efficiencies and increase stakeholder confidence when decisions made by AI are subject to professional accountants' ethical judgments.

RESEARCH METHODOLOGY

To examine the impact of automation upon the accounting process in a corporate context, this research adopts a qualitative descriptive approach, utilizing secondary research from academic journals, industry reports and white papers published by large accounting firms and consulting companies. Data from ACCA, Deloitte Perceptions, KPMG and the World Economic Forum were used to identify the emerging trends in automation and how these trends may impact the accounting profession.

The research process can be looked at in three parts: the conception of theory through literature review, the analysis of the tools of automation and their contribution to accounting efficiency, and the thematic analysis of the ethical, economic, and human ramifications of accounting automation. The study does not collect primary data; it is purely analytical. The aim is to illuminate the evolution of accountants' work due to automation, while stressing the interpretive and ethical aspects beyond the capabilities of machines.

RESULTS AND DISCUSSION

In addition, it is concluded that automation of financial report production has been improving the efficiency and quality of financial reports. Companies using artificial intelligence financial report systems have been reporting shorter financial closing cycles, lower financial closing operational costs, and improved reliability of financial data. Transitioning to automated reporting also showed the need for human oversight, as computers are much faster than humans in calculating information yet are unable to interpret ambiguous data and cannot make moral decisions in uncertain contexts.

A commonly occurring theme in the literature studied was the emergence of the new type of accountant, labeled the "hybrid accountant", with a combination of technology skills and analytical skills. They can engage in more value-added tasks like data validation, risk interpretation, and forecasting, and spend less time on data entry. Studies cited by KPMG (2025) and Deloitte (2024) conclude that firms applying a hybrid human-machine model achieve higher levels of both audit quality and stakeholder confidence than firms relying solely on machine-driven models.

However, regulators and investors are skeptical in regard to automated reporting due to concerns of manipulation, algorithmic bias, and attacks. Firms should implement explainable AI systems to reduce these concerns because explainable AI systems allow auditors and regulators to understand the rationale behind the AI-generated results.

Additionally, the findings point to why education and continuous professional development matter in this field. ACCA and CPA now educate people on topics such as digital auditing, data analytics, and the ethics of artificial intelligence to prepare accountants to work in a future workplace that relies increasingly on technology and AI.

Therefore, it is generally accepted that computerization can augment the accountant's role but not replace it. The best implementations of computerization allow accountants to work with the integrity of the data but rely on human judgment for interpretation, governance, and ethics.

CONCLUSION

Today, companies have the ability to transform their financial statements using automation and AI technology in ways that give them unprecedented efficiency, accuracy, and perception. Yet, the human

touch cannot be replaced. However, accounting, since its beginning, has been as much about judgment and skepticism as it has been about calculation and modeling. Machines can compute and predict but lack the moral and contextual knowledge that supports trust in financial accountability.

Accountants will not be replaced by machines, rather they will be re-purposed as interpreters of the output generated by the machines, ensuring checking for compliance, and that the outputs are ethical. Machines will continue to be used to perform the mechanical activities of accounting, while humans will be responsible for governance and judgement, and will bring integrity into the process. The business that use a hybrid mode of automation and human skills will be the ones that succeed the most.

So automation will, in the best cases, support accountants: the future of corporate financial reporting is best viewed as a partnership of human intelligence and machine precision.

REFERENCES

1. CPA.com. (2025, June 9). *CPA.com issues 2025 AI in accounting report: Latest research provides roadmap for accounting firms aiming to harness AI as a competitive advantage*. CPA.com. <https://www.cpa.com/news/cpacom-issues-2025-ai-accounting-report>
2. Oracle. (2025). *Next-generation financial management with Oracle Cloud ERP*. Oracle Whitepaper. <https://www.oracle.com/erp/financials/>
3. Hasan Amiri, S. M., & Mithila, M. (2025). Automated accounting systems: Redefining the role of the accountant. *International Journal of Science and Research Archive*, 15(02), 908-920. <https://doi.org/10.30574/ijrsra.2025.15.2.1476>
4. Journal of Accountancy. (2025, July 31). *Accounting automation's intelligent future*. Journal of Accountancy. <https://www.journalofaccountancy.com/issues/2025/aug/accounting-automations-intelligent-future/>
5. MnCPA. (2025, July 23). *The impact of AI in accounting: Uses and automation benefits*. MnCPA. <https://www.mncpa.org/resources/publications/footnote/august-september-2025/the-impact-of-ai-in-accounting-uses-and-automation/>
6. KPMG. (2025). *Building trust in AI-driven financial reporting*. KPMG Thought Leadership.

<https://kpmg.com/global/en/home/insights.html>

7. PwC. (2025). *The human-led and tech-powered future of accounting*. PwC Global.
<https://www.pwc.com/gx/en/services/audit-assurance.html>
8. Stanford Graduate School of Business. (2025, June 25). *AI is reshaping accounting jobs by doing the “boring” stuff*. Stanford GSB Insights. <https://www.gsb.stanford.edu/insights/ai-reshaping-accounting-jobs-doing-boring-stuff>
9. Deloitte. (2025). *The digital transformation of audit and financial reporting*. Deloitte Insights.
<https://www2.deloitte.com/global/en/insights.html>
10. Ernst & Young. (2025). *Intelligent automation in finance: From efficiency to strategy*. EY Global.
https://www.ey.com/en_gl/finance
11. SAP. (2024). *Automating financial consolidation with SAP S/4HANA*. SAP Whitepaper.
<https://www.sap.com/documents.html>
12. World Economic Forum. (2024). *The future of jobs report: The accounting profession in transition*. WEF Publications. <https://www.weforum.org/reports/>
13. McKinsey & Company. (2025). *Automation and the evolution of finance operations*.
14. McKinsey Digital Report. <https://www.mckinsey.com/capabilities/mckinsey-digital>

The Algorithmic Age: Challenges and Opportunities

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ABSTRACT

This study is part of the activities linked to the Technological Communication Laboratory #Labtec_ at Fatec Itaquaquecetuba, in the Paula Souza Center, with support from the São Paulo Research Foundation (FAPESP). From this perspective, a research question arises: how does Artificial Intelligence (AI) impact people management, corporate culture, and decision-making processes, highlighting the ethical, social, and legal challenges and opportunities that emerge from this integration? The objective of this essay is to study some changes in organizational behavior resulting from Artificial Intelligence (AI). From a methodological perspective, proposed in an essay format, the interdisciplinary qualitative research adopts an exploratory approach, based on a literature review. From a theoretical perspective, a line of contemporary studies serves as a strategy for updating and/or innovation. Thus, the expected result demonstrates a creative and flexible transition in the production of information and technology, with other training practices in the field of technological education.

Keywords: Artificial Intelligence, Contemporary, Technology.

INTRODUCTION

Artificial Intelligence (AI) has brought about profound changes in organizational behavior. Consequently, the business world should be aware of the challenges and opportunities in transforming processes and technological tools.

The Algorithmic Era has redefined the role of organizations and contemporary society by incorporating intelligent technologies into human processes (Zizek, 2023). From a practical perspective, by automating operational tasks and providing predictive insights, AI transforms the strategic dynamics among employees, leaders, and organizational structures.

This essay is contextualized based on four disciplines:

1. "Advertising and Propaganda" from the Commercial Management Technology Course.
2. "Marketing" from the Secretarial Technology Course.
3. "Consumer Behavior in the Digital Age" from the Electronic Commerce Management Technology Course.
4. "Marketing Fundamentals" from the Information Technology Management Technology Course.

This is a large set of disciplines taught by the Advisor. And this discussion was organized around the Management, Technology, and Information axis (Sant'ana, 2014), according to the project's classification within the sector of activity at the Paula Souza Center (CPS).

In this sense, the #Labtec_ at Fatec Itaquaquecetuba is a flexible space for developing tasks. It serves students and teachers to develop content production contents for the internet, with the aim of instilling a culture of research within the Teaching Unit.

RESEARCH PROBLEM

This study is part of our activities linked to the Technological Communication Laboratory #Labtec_ at Fatec Itaquaquecetuba, in the Paula Souza Center, with support from the São Paulo Research Foundation (FAPESP). In this case, #Labtec_ offers training practices in technological education developed on the internet using various hypermedia tools.

From this perspective, a research question arises: how does Artificial Intelligence (AI) impact people management, corporate culture, and decision-making processes, highlighting the ethical, social, and legal challenges and opportunities that emerge from this integration?

OBJECTIVES

Based on the challenges and opportunities to be overcome in this work proposal, the goal is to study some changes in organizational behavior resulting from Artificial Intelligence (AI). And consequently, this will explore the role of agile methodologies, the strategic role of developers, and the use of classic management tools – such as PMBOK, Ishikawa Diagram, SWOT Analysis, and ROI – in building collaborative, adaptive, and data-driven environments.

It intends to offer technological professional training with creativity and flexibility for students and teachers. This will bring scientific and technological evidence to the production of content for social media, based on #Labtec_ at Fatec Itaquaquecetuba, CPS, FAPESP.

METHODOLOGY

From a methodological perspective, proposed in an essay format, the interdisciplinary qualitative research adopts an exploratory approach, based on a literature review. Rehearsing allows us to experiment, test, and examine, which invigorates our way of thinking about contemporary. From a theoretical perspective, a line of contemporary studies (Harari, 2024; Hui, 2020; Quintarelli, 2019; Zizek, 2023) serves as a strategy for updating and/or innovation.

The methodological approach is an interdisciplinary technological practice with strategies and experiments focused on technical and scientific merit, focusing on the essay format (Canclini, 2016). In this case, these focuses and strengthen the research culture in our college.

This dynamizes technological experimentation with direct application to the daily life of digital culture. Furthermore, by supporting the use of technological equipment at the #Labtec_ at Fatec Itaquaquecetuba, CPS, supported by FAPESP, the various challenges and opportunities that may arise, including the difficulties to overcome, are observed in monitoring these activities. Ultimately, overcoming these difficulties highlights the quality of professional technological training provided.

The implementation of Agile methodologies has been crucial in addressing the rapid pace of technological transformation. Multidisciplinary teams operate in short, iterative cycles, promoting collaboration, continuous adaptation, and value delivery. This methodological approach fosters more flexible organizational cultures, open to innovation and experimentation, aligned with the principles of AI and intelligent automation.

THE MARKETING EFFECT IN THE ALGORITHMIC AGE

The complex process of digital transformation is key to influence followers on social media to generate engagement, create opportunities, and mitigate challenges. Therefore, the use of AI in online promotional activities impacts brand reputation, which in turn strengthens employee morale and commitment.

With emerging technologies, the marketing field seeks strategy, promotion, publicity, and innovation by strategically communicating the benefits and advantages of a product, brand, or service. Well-structured campaigns validate creative and flexible actions, especially within organizational culture. It aims for efficiency in the production system.

According to Bulla (2025), "not everything that can be automated should be treated as equivalent to what is lived." There may indeed be a simulation of reality against human behavior in its complexity (Zizek, 2023).

If information technology professionals working as Algorithm Developers in Organizational Transformation become strategic agents of change, seeking added value for the productive systems of contemporary capitalism, what can be done? Undoubtedly, the various actions of these developers directly influence the employee experience and a company's internal processes (Canclini, 2021).

Between security and governance, the application of AI must comply with the General Personal Data Protection Law (LGPD Law n°. 13,709/2018), which regulates any type of personal data processing in Brazil. Therefore, algorithms used in HR, marketing, or organizational management should be consistent and respect fundamental principles such as purpose, consent, and transparency.

The AI can perhaps offer valuable strategic support for any decision-making process even more with the use of classic management tools. In this case, this likely guarantees individual and collective rights, as well as the opportunity for users interacting with social media and the internet to decide what to do with

these technological possibilities (Acemoglu & Restrepo, 2025; Bulla, 2025).

This raises serious ethical questions about accountability, transparency, and privacy, as it involves challenging human values. Information management, as well as data governance, should be conducted according to rigorous professional criteria, highlighting the appropriate consequences. In other words, this management must prioritize governance practices that align with contemporary ethical standards.

As the future of work (Quintarelli, 2019), the coexistence of humans and machines demands new skills: critical thinking, emotional intelligence, adaptability, and digital fluency. The role of leadership has grown increasingly in mediating the various relationships between human teams and intelligent systems (Zizek, 2023).

Thus, corporate governance practices are essential for the development of information management today. This aims to foster collaborative and innovative environments.

For Acemoglu & Restrepo (2025), “the implementation of AI cannot be a privilege restricted to large corporations; public policies must ensure that small businesses and professionals have equal opportunities for innovation.” In this context, empowerment guarantees democratic access to information. The practices and tools – that promote collaboration and communication between teams – become pillars of this new organizational reality. These complex situations require further investigation in terms of technological (re)dimensioning and consumption (Hanns & Garcia, 2015).

EXPECTED RESULTS

Certainly, the expected result involves a creative and flexible transition in the production of information and technology, with other training practices in the field of technological education. For Harari (2024, p. 158), education and the press must “inform people about things they themselves have never faced. Without an education system or media platforms to play this role, no meaningful conversation on a large scale can take place.” It is necessary to consider human values. Also, as we can see from figure 1:

Figure 1:

Reference: *The Authors*

The focus of this research is on monitoring challenges and opportunities in the world of work. That's the point: create opportunities (the optimizations) and reduce challenges (the impacts). When creating solutions based on AI guidelines, the developers must understand optimizations as opportunities but also impacts as challenges. Optimizing and/or impacting are unique professional decisions in the contemporary organizational context. In short, this is marketing effect in the algorithmic era.

FINAL CONSIDERATIONS

In conclusion, the essay confirms that Artificial Intelligence (AI) has had a strong impact on companies' production systems every day. The marketing effect in the algorithmic era as dynamic strategy should be considered through opportunities (optimizations) and challenges (impacts). This is why investment in technology is so evident today, strategically combining intelligence and information to produce knowledge.

From a technological perspective, this establishes international standards for access to information, eminently guided by public policies in the globalized world. Ultimately, the organizational context must prioritize trust and transparency as fundamental values that promote ethical, safe, and responsible brands, products, and services in this new technological paradigm.

REFERENCES

1. Acemoglu, D., & Restrepo, P. (2025). *AI and the future of work*. MIT Press.
2. Brazil (2018). *General Personal Data Protection Law (LGPD)*, Law n°. 13,853.
3. Bulla, E. (2025). IA generativa na pesquisa de mercado. *Meio & Mensagem*, São Paulo.
<https://www.meioemensagem.com.br/opiniao/ia-generativa-na-pesquisa-de-mercado>

4. Canclini, N. G. (2021). *Cidadãos substituídos por algoritmos*. São Paulo: Edusp.
5. Hanns, D. k.; Garcia, W. (2015). *#consumo_tecnológico*. São Paulo: Hgrado.
6. Harari, Y. N. (2024). *Nexus: uma breve história das redes de informação, da idade da pedra à inteligência artificial*. São Paulo: Cia das Letras.
7. Hui, Y (2020). *Tecnodiversidades*. São Paulo: Ubu.
8. Quintarelli, S. (2019). *Instruções para um futuro imaterial*. São Paulo: Elefante.
9. Sant'ana, A. (2014). *Propaganda: teoria, técnica, prática*. 7. ed. São Paulo: Pioneira.
10. Zizek, S. (2023). O deserto pós-humano. Available at:<O deserto pós-humano | LavraPalavra>. Access at: 10 set 2025.

AI in Reshaping, Redefining, and Revolutionising Customer Service

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ABSTRACT

This paper examines the impact of Artificial Intelligence (AI) on customer service. It analyzes how customer experience and engagement processed and evolved from operations that center on humans to customer service that AI enables, is high-speed, personalizes, and is efficient. AI enables companies, through technology such as chatbots, predictive analysis, and sentiment analysis, to pre-empt customer requirements, automate repetitive processes and provide 24x7 customer service, and ultimately improves customer satisfaction. AI is helpful to customer service in regard to customer experience, cost savings, and loyalty. Issues related to data privacy, algorithmic bias, and loss of human empathy are still pressing concerns per findings. The research has demonstrated a need for responsible and ethical deployment of AI tools that act as a companion to the human experience. AI shows potential to change the game because it streamlines operations and it creates customer experiences that are more proactive, personalized, and emotionally smart.

Keywords: Artificial Intelligence, Customer Service, Automation, Personalization, Customer Experience

INTRODUCTION

For customer service, you assist your customers before, during, and after they buy and use your store's products or services within reason. You can grow your business and serve customers better when you interact with each customer. Research shows that customer service can affect customer retention, also increase loyalty, repeat purchasing, referrals, and the company's reputation. It can also increase sales. Good customer service leads to satisfied employees and can also be a competitive advantage. Artificial intelligence impacts customer service with tools that route and automate service requests, predict

customer behavior and personalize service. AI changes service management by powering automation of repetitive tasks, and allowing responses to be faster to provide customers more accurate, personalized and consistent experiences. AI changes the customer experience. AI redefines the customer experience. AI transforms and elevates the customer service. This enables companies to anticipate customer needs, deliver instant help and personalized services, and improve customer satisfaction and loyalty for them. AI drives customer value through a combination of data and perceptions to transform customer service. It changes the service from a reactive function to a proactive function. This research studies how people use Artificial Intelligence in customer service to increase productivity, improve personalization and engagement, analyze how people apply these technologies plus what advantages and challenges they present, and explore the role of Artificial Intelligence in the future of customer-business interactions.

EVOLUTION OF CUSTOMER SERVICE AND EMERGENCE OF AI

Customer service has changed dramatically from slow in-person assistance to real-time assistance with artificial intelligence. Prior to the telephone, customer service was slow and personal in nature, without the aid of technology. Without the telephone, if shoppers had questions or a complaint, they visited the shop in person or wrote a letter to the merchant. Merchants' availability and the speed of the postal service determined how soon the shopper would get a response.

Businesses could be on call, first with the phone in 1876, then with the switchboard in 1894. In the 1960s, PABX-based central call center operations could handle inquiries within minutes or a few hours. The quality of service depended on the availability of staff in a call center, and hours worked.

The rise of the Internet from the 1990s to the 2010s saw email become a more common method of customer service, with response times coming down from weeks to hours. By the 2010s, live chat and social media had become increasingly able to deliver real time customer service.

In the most recent incarnation, chatbots and artificial intelligence now provide near-instant responses to the majority of basic questions, while humans can be reserved for more complicated queries that are answered, in minutes. The use of purchase history and sentiment analysis results in personalization at scale, operational efficiency through automation, and around-the-clock service availability. These developments mark a shift from reactive, human-dependent customer service, to proactive, data-driven and highly efficient customer service models based on customer needs.

APPLICATIONS OF AI IN CUSTOMER SERVICE

Artificial intelligence changes what customers experience. It is obvious within customer service through chatbots and virtual assistants like ChatGPT, Alexa and Google Assistant. These answer customer inquiries and learn from each interaction. Chatbots exist mainly for this specific purpose. Chatbots can now answer basic questions that are frequently asked, help customers choose what they want in addition and even resolve other queries. Chatbots are available every day of the week at all hours making it highly accessible.

Predictive analytics is another common use case. Companies can predict customer behavior by analyzing past data such as recommending products based on browsing history and purchase history . This produces a tailored and smooth experience that satisfies customers and keeping them loyal.

Sentiment analysis is another one - businesses can assess customer sentiment through reviews about their products, written emails or posts on social media. This can help businesses understand customers and build strong relationships.

Finally, AI has advanced within companies' omnichannel service strategies, providing companies with a more integrated support across email, social media and phone channels. Now companies serve customers with smoothness and consistency across varied channels. This allows customers to switch when convenient, and they do not lose context. The customers do not interrupt service. No one asks customers for repetitions.

BENEFITS OF AI-POWERED CUSTOMER SERVICE

There are many applications and benefits with AI in customer services for companies and consumers. First, AI can operate at high speed and perform the same kinds of tasks over and over again. This includes order tracking, password resetting, and responding to frequently asked questions. As such, AI reduces wait times, improves efficiency, and cuts costs while meeting customer expectations.

The biggest advantage of an automated question answering system is that it can be more cost efficient. By automating questions, companies can reduce the size of call centers and lower labor costs. AI systems can scale well. They can process many customer interactions at the same time.

AI can support branding when it personalizes for the masses, analyzes data sets, and customizes responses and recommendations to build a relationship with customers. Brands also can use AI to make data-driven reports and perceive with the reports to understand trends, gauge customer satisfaction, and improve the product/service based on findings.

AI for customer service mainly impacts the customer experience's three pillars which are efficiency, consistency and personalization resulting in better brand loyalty, higher retention rates and a profitable future.

CHALLENGES AND LIMITATIONS

Despite these advantages, the use of AI in customer support translates into drawbacks with the main arguments focusing on the lack of empathic and other human strengths. Although they can process information much faster, an AI system will not understand and cleverly sense emotions like a human agent, which can frustrate customers who need empathy or subtle messaging.

Privacy and security of data is also a challenge. AI systems typically require a lot of data on individuals and their behavior to function properly. That data is open to cyberattacks and misuse. That affects customer trust and company's reputation.

There is a risk of people becoming too reliant upon these systems, deferring too much to them and possibly leading to errors or messages that are not tailored to individuals. Bias poses a risk as it may produce discriminatory responses to queries. Bias can produce inaccurate responses to queries when training data lacks variety.

For smaller organizations, cost and needed expertise for use of these AI tools might create a barrier. Businesses must consider AI's efficiency alongside human empathy. Businesses must use a strong ethical and data governance framework for addressing concerns.

CASE STUDIES AND INDUSTRY EXAMPLES

In these industries, leaders have put AI into place successfully within the customer experience domain. Companies like Amazon use AI to recommend products. Amazon uses AI to predict customer preferences and manage customer service inquiries through chatbots. Overall, automation at this high level not only

betters the experience but it drives repeat purchases.

H&M and Sephora use virtual assistants. The virtual assistants give custom fashion and beauty tips. The tips rely on a customer's profile creating retail similar to artificial intelligence store consultants.

AI customer service chatbots are also being implemented within the banking and airline industries, where they can be used for tasks such as purchasing flight tickets, flight updates, baggage tracking, fraud alerts, balance queries, and loan applications, while reducing operational costs and offering 24/7 support to users and businesses.

Even small and medium-sized enterprises (SMEs) have begun to employ AI customer engagement and process management systems. Companies such as Zendesk and Freshdesk offer reasonably priced products for smaller organizations. Small organizations can then rival big ones. Case studies show the power from AI to make processes leaner, to tailor services, and to raise customer satisfaction.

ETHICAL AND HUMAN-CENTERED CONSIDERATIONS

AI continues to be used in customer service with human-centered ethics, and a need to balance automation with a human touch remains important. Customers appreciate empathy with understanding and an emotional response. Firms must therefore ensure that AI works alongside human operators, and not instead of them, while also ensuring that customers feel heard and respected.

Transparency is another broad ethical guideline; it means telling customers they are speaking with AI. It also means naming which parties access their data and the reasons for access. Another issue to be solved around AI bias is ensuring that customer-facing services are not inequitable, which can be addressed by sourcing diverse training data.

Ultimately, because technology advances, we must consider the future of human jobs in customer service. While some routine tasks will be replaced by automation, it will also free employees up for higher value tasks such as problem-solving, building relationships and customer experience strategy. A human-centered approach means that AI is designed to improve, rather than replace human roles.

ECONOMIC AND BUSINESS IMPLICATIONS

The economic impact of AI in customer service is the cost-savings and labor realignment from low-importance to calculated work. On average, businesses have a 30% cost reduction in service roles, regardless of their size, from introduction of AI in the customer service industry.

Additionally, AI can handle large volumes of customer contacts without fatiguing, so companies can deploy fewer employees to assist contacting customers and improve productivity, while also communicating consistently with customers. If businesses personalize services and communications, those actions can also retain customers and improve revenue.

AI systems require infrastructure, training, data security, and ensuring employees have the skills to best implement the tool. While there may be a cost of building out and implementing an AI system, relative to the increase in profits, customer satisfaction, and competitive advantage to the business, the investment makes financial sense in the long run.

FUTURE OF AI IN CUSTOMER SERVICE

The next generation of AI customer service may be even more human-like. Historically known as Emotional AI, new technology predicts and interprets a user's tone, mood, or facial expression, providing output with empathy. These will enable companies to provide more personalized, emotionally clever interactions.

In a few years, customer adventures will be hyper-personalized, with AI understanding customer needs even before customers express them. AR and VR will be integrated into customer service contexts and will be used more in retail and healthcare sectors.

By 2035, people expect that AI will mainly interface for customers around the world, delivering experiences that combine empathy and automate to provide human-like experiences. Organizations with an embrace of AI will be best positioned to succeed.

RESEARCH METHODOLOGY

This study employed a mixed-methods approach to examine how artificial intelligence (AI) is reshaping, redefining, and transforming customer service practices.

A comprehensive literature review was conducted, drawing on peer-reviewed journals, scholarly articles, and industry reports to synthesize insights on AI's development, deployment, and sectoral impacts.

Case studies of prominent firms like Amazon, H&M, Sephora, and Zendesk were analyzed to elucidate the features, technical architectures, and implementation strategies of AI-driven service systems, supplemented by secondary data on customer satisfaction, operational efficiency, and performance metrics.

Ethical, social, and economic implications of AI in customer interactions were further explored through targeted reviews of extant literature, enabling pattern recognition, trend identification, and derivation of forward-looking lessons without initial primary data collection.

RESULTS AND DISCUSSION

The study finds that customer service has become greatly faster, more accurate and more personalized. Firms find that using AI in customer service leads to increased satisfaction and efficiency. Artificial intelligence tools can handle repetitive tasks whereas human agents manage more complex issues.

The report suggests that issues of data security and loss of human empathy need to be addressed as customers expect speed and efficiency combined with compassion and safety. Thus, businesses need a hybrid model.

CONCLUSION

This study demonstrates that artificial intelligence (AI) is redefining and revolutionizing customer service through process automation, predictive analytics, and personalization, thereby enhancing customer engagement and operational efficiency. Although concerns such as privacy risks and diminished empathy persist, the advantages of this transformative technology substantially outweigh the potential drawbacks when responsibly implemented.

Looking ahead, ethical and transparent AI deployment can foster mindful customer interactions. Rather than supplanting human agents, AI should augment their capabilities, enabling faster, more intelligent and meaningful engagements. As technology continues to evolve, AI will remain pivotal in delivering superior customer experiences.

REFERENCES

1. Crescendo AI. (2025, October 23). Emerging AI trends in customer service. Crescendo AI. <https://www.crescendo.ai/blog/emerging-trends-in-customer-service>
2. DevRev. (2025, October 9). Future of AI in customer service: Its impact beyond 2025. DevRev. <https://devrev.ai/blog/future-of-ai-in-customer-service>
3. Deloitte AI Institute. (2024). Applying AI to drive superior customer outcomes. Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-ai-institute-ai-in-customer-experience.pdf>
4. Forbes Business Council. (2024, August 22). Customer service: How AI is transforming interactions. Forbes. <https://www.forbes.com/councils/forbesbusinesscouncil/2024/08/22/customer-service-how-ai-is-transforming-interactions/>
5. IBM. (2025, June 4). The future of AI in customer service. IBM Think. <https://www.ibm.com/think/insights/customer-service-future>
6. Mailchimp. (n.d.). Importance of customer service explained: 8 benefits. Mailchimp. <https://mailchimp.com/resources/importance-of-customer-service/#:~:text=Your%20customer%20service%20team%20is,to%20your%20company%20over%20time>
7. Matrix42. (n.d.). AI in service management and its impact. Matrix42. <https://www.matrix42.com/en/ai-in-service-management#impact>
8. McKinsey. (n.d.). Enabled customer service. LinkedIn. https://www.linkedin.com/posts/mckinsey_the-next-frontier-of-customer-engagement-activity-7108954229192474625-oyYS
9. Oracle. (n.d.). What is customer service? Oracle. <https://www.oracle.com/in/cx/service/what-is-customer-service/>
10. Vonage. (2025, May 4). AI customer service: Everything you need to know in 2025. Vonage. <https://www.vonage.com/resources/articles/how-ai-improve-customer-service/>
11. Webex. (2025, February 17). 10 ways AI is revolutionizing customer service in 2025. Webex. <https://blog.webex.com/customer-experience/ten-ways-ai-is-revolutionizing-customer-service-in-2025>
12. Zendesk. (2024, August 8). 13 ways AI will improve the customer experience in 2025. Zendesk. <https://www.zendesk.com/sg/blog/ai-customer-experience/>

The Impact of Artificial Intelligence on Employees' Productivity: A Study of Educators' Perspective in Higher Education Institutes at Early Stage of AI Adoption

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ABSTRACT

In recent times, AI has been evolving drastically and is going to have a substantial impact on higher education institutions (HEI). This research aims to identify the influence on employees' productivity due to usage of artificial intelligence (AI) in universities in India which involved using quantitative research method by surveying 32 teaching staffs of a university. It investigates how the perceptions of faculty members towards using AI influences their productivity. The findings indicate that at the stage of adoption although the educators recognise the efficacy of using AI and its ease of usage but are still navigating challenges being faced during this phase which can dampen the productivity temporarily. This early-stage phase of adoption demands time, training and support from institution for better outcome. Considering universities' purpose to make students industry ready it is important for education sector to stay informed of such technological development and commit towards research in this area.

Keywords – Productivity, Higher education institutes, Teacher, University, Artificial Intelligence

INTRODUCTION

The emergence of Artificial Intelligence (AI) in the workplace has led to a transformational phase of reshaping industries and the way business function. AI is a subdivision of computer science that focuses on the development of intelligent machines that are capable of carrying out activities traditionally only performed by human intelligence, including learning, problem-solving, and decision-making (Sarker, 2022). The need to apply AI to promote innovation in other areas has now become vital in the field of

media and entertainment, healthcare, agriculture, education, finance, and telecommunications (Guibao et al., 2018, Sarker, 2022, Szczepaniuk and Szczepaniuk, 2022). Such introduction into workplaces enhances the productivity of employees in a multiplicity of aspects by introducing automation of repetitive tasks, enhance decision making, personalized employee development, and simplifying workflows to enable the staffs to work on strategic and creative work. Although AI is efficient and innovative, a thoughtful approach to the development of the workforce is necessary to meet the emerging needs in skills and avoid potential stress caused by technology, eventually becoming more satisfied with their jobs and contributing to better organizational results.

The AI is important in increasing employee productivity (EP). Employee productivity in the case of AI can be considered as the output per unit of input employed by an employee, considering the AI effect on the performance and health of employees. The productivity of employees is influenced by several variables among them being efficiency, effectiveness, job satisfaction, employee engagement and motivation. By automating tedious tasks and depriving employees of the tedious jobs of millions of their time, AI can make employees happier and more engaged in their work, as well as spending the remaining time on more demanding and rewarding tasks (Russel and Norvig., 2015). This does not only result in efficient workforce but also less stress and burnouts which cause increasingly productive and engaged human resource. In the end, it results in enhanced purpose and higher involvement promoting productivity. It is also possible to use AI to endow employees with new abilities and knowledge through sufficient training and helping with the emergence of new skills. This later enhanced productivity results in better organizational performance including high output, better quality and customer service.

This indicates that application of AI in the workplace has been boosted around the world but in the field of education especially in the developing countries such as India, the penetration of AI has been low due to skills gaps, ethical issues, infrastructural inadequacies, ambiguous policies, and access to the internet in some regions. According to a new countrywide survey by Centre for Teacher Accreditation (CENTA) 70% of the teachers engaged in using AI tools in the classroom but typically as a back-of-the-scene assistant to the task such as lesson planning not something which can directly interact with the students, this shows the absence of proper understanding of the technology (India Today, 2025).

In the education sector, AI has revolutionized the functions, roles and performance of the teaching staffs. Following the recent studies, AI and large language models (LLM) can positively impact the effectiveness of the instruction and simplify the work of the administration and convert the students into

personalized learning (Chen, L., Chen, P., and Lin, Z., 2020). It has been steady to embrace the application of AI-based tools, which assist educators in curriculum design, grading, and feedback, with additional time saved to carry out other significant duties involving encouraging students and introducing new teaching strategies. Although most of the faculty are aware of the potential of AI to enhance productivity and quality of teaching, there is quite a disparity in the uptake, perception, and perceived obstacles across geographical and subject areas. (Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., Lekkas, D., & Palmer, E. 2024)

On the contrary, there have been several researches which describes negative impact of AI such as displacement of human jobs, biasness & threat to privacy (Abuselidze and Mamaladze, 2021). Similarly, as per Chan, C (2023) and Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022) there has been concerns related to data privacy, academic integrity and increased stress among faculty to adapt to new technologies.

Despite the prior researches, there still exists knowledge and methodological gaps to some extent especially in the developing countries like India and education sector. Due to these gaps, there exists lack of clarity in understanding the impact of AI on the employee productivity within various firms and organization having different cultural and socio-economic environment like Indian education institutes, this will offer valuable insights on to the challenges and opportunities of integrating AI in such organization.

This paper will describe the perspectives of the teaching staffs of the university observed through the survey which addresses the following research question: “What are the perspectives of educators in higher education institutes on the impact of AI on employee productivity?”

LITERATURE REVIEW

An article by (Naqbi et al., 2024) is an exploration of application of Generative Artificial Intelligence (GAI) in various professions. Based on the PRISMA methodology, the researcher sampled 159 research publications and investigated the application and effects of GAI in the institutional performance, specifically in the field of academia, research, technology, communication, agriculture, government and business. The results have reflected the increased prominence of chatbots and conversational agents with ChatGPT being one of the leading tools, as well as this researcher brought up the issues of employing AI, including increased ethical issues, critical thinking, and regulation. The review concluded that GAI

research is on a boom and will likely to continue expanding beyond 2024, with future work needed to improve system design, evaluate user experience, and ensure strategic long-term integration.

This implies that increased usage of AI has led to a beginning of a transformative era across several sectors with higher education being a significant domain experiencing its overpowering influence.

The study focuses on analyzing the future of work of academics in the age of artificial intelligence which involved discussing the work of knowledge workers in relation to AI across dimensions i.e. space, time and task. The researcher concluded that the incorporation of AI increases the ability of the institutes to process data and adjust to certain goals that reflect natural intelligence by sensing and feeling the surrounding environment, thus changing the traditional ways of teaching, research and administration work in the institutes. (Renkema & Tursunbayeva, 2024).

As it can be seen, AI has focused on the ability to meet specific objectives by emulating the human intelligence and reimagining the routine activities of the staffs in the institutions of higher learning.

Ranging from boosted innovations in the administrative procedures like admissions, enrolment, records management, and financial assistance, this review paper by (Suleman Ahmad et al., 2025) reveals that AI can bring greater innovations to the educational processes, including personalized learning, engagement monitoring, and data-driven intervention to help students succeed. Among the study results, the strategic leadership was also instrumental in aligning the AI adoption to the mission of institutes, promoting innovation and developing governance structure so as to handle the ethical concerns, possible biases and workforce issues. The review has concluded that further technological advancement, ethical considerations, and research growth by artificial intelligence will play a crucial role in the future of the sphere of education and will allow the HEIs to use its capabilities to the fullest with students, professors, staff members, and society.

Universities and other institutions of higher learning are keenly looking into the application of AI in their most important sectors like in research work, administration and their instructional approaches.

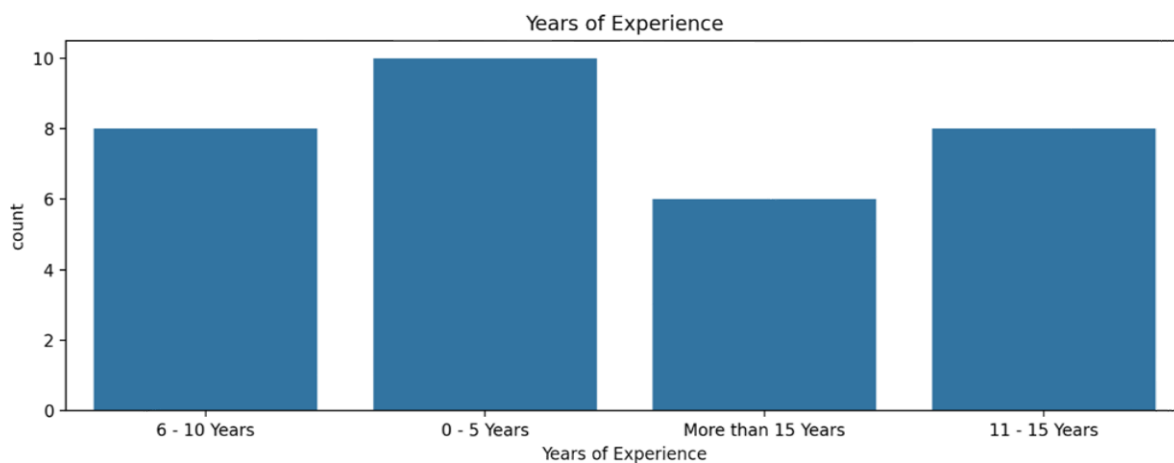
METHODOLOGY

The data for this research was collected through online survey using Google form. Researcher was able to collect 32 responses from the survey. The Google form had 24 questions in total covering demographics,

general information and questions related to AI and productivity involving objective questions in yes or no and a 7-point scale where respondents were asked to respond to the questions. This survey design was intended to collect quantitative data. Surveys were circulated among the faculty members of the university. The whole dataset was at first coded manually in the Microsoft excel spreadsheet and then the prominent themes were identified and grouped to analyze the data and interpret the results.

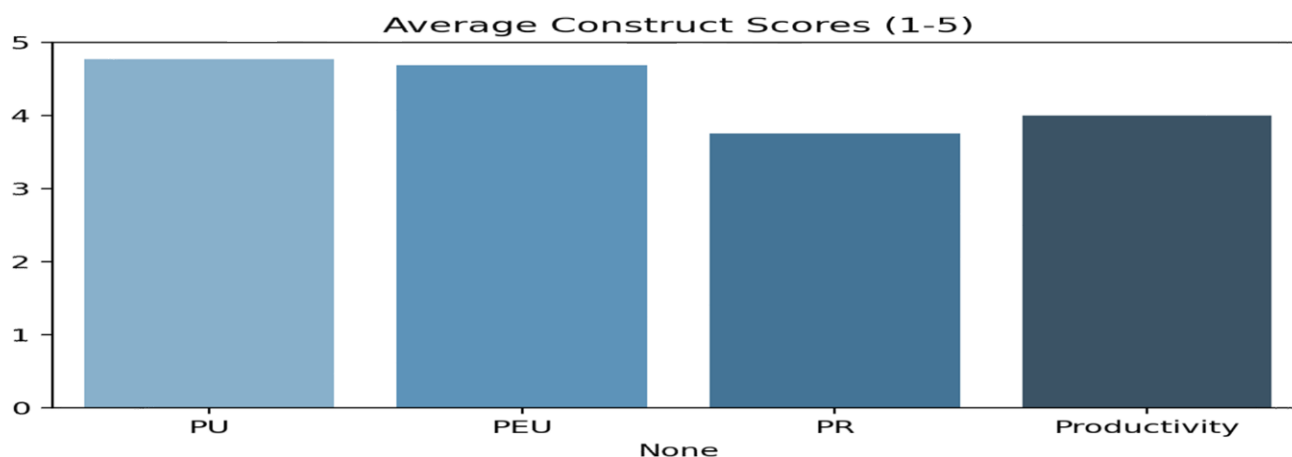
DATA

Participants in the study comprised both male teaching staff (78%) and female teaching staff (22%). The sample respondents involved professors (87%) and teaching assistants (13%). The years of experience of respondents ranges from 0 – 5 years (31%), 6 – 10 years (25%), 11 – 15 Years (25%), and more than 15 years (19%).



RESULTS & DISCUSSION

Overall attitudes of survey respondents towards AI are positive where average scores for usefulness, ease of use and productivity are high while perceived risk is lower than average. When respondents were asked whether they face difficulty in using AI, majority of them faced no difficulty (56%), 38% faced difficulty sometimes and 6% accepted the difficulty one face while integrating AI with work. 50% respondents believe they have been provided adequate training from institution to use AI tools in their workplace, whereas 38% responded negatively, and 13% responded as not sure.



Cronbach's alpha is calculated to check the construct level reliability which resulted as acceptable for most scales, especially for the productivity and perceived ease of use, indicating those item groups consistently measure the same idea. The Cronbach's alpha values were 0.73 in case of Perceived Usefulness (PU), 0.77 for Perceived ease of use (PEU), 0.55 for Perceived Risk (PR) and 0.91 for productivity. This demonstrates productivity and PEU have strong internal consistency, PU is acceptable and PR is lower which suggests that risk items are less internally consistent or more varied among respondents.

The computed mean scores of the respondents shows consistent high ratings on PU, PEU and Productivity for many participants; and PR varies more across respondents. Some respondents rate PR high while still rating usefulness and productivity high indicating mixed feelings which shows that respondents see value but also worried about the risks.

AI expertise relates negatively with PR and shows a meaningful positive correlation with productivity. The correlation of level of AI expertise and Perceived risk resulted -0.517 which makes intuitive sense that teachers who are more skilled or familiar with AI are less threatened with the risk of AI; whereas, the correlation of AI expertise and productivity resulted 0.34 which describes the teachers who are more adept at using AI tools tend to feel more productive, this suggests that AI literacy and skill development programs could be key productivity boosters and the correlation between years of experience and productivity lead to 0.36 which shows a moderate positive correlation signifying that teachers with more experience are more strategically equipped to integrate the technology into workflow. However, it can also be stated that since, it is not a strong relation it is not guaranteed that years of experience is only the key to successful integration of AI but expertise level also plays a crucial role. Thus, it can be interpreted that higher self-reported AI expertise is associated with lesser perceived risk and higher perceived

productivity from AI and experienced users may both rely on AI more and be more aware of potential risks.

There is a positive correlation between the usage of Artificial Intelligence for pedagogical purposes and PU and with PEU as well but negatively with productivity. Usage of artificial intelligence for academic purpose and its Perceived Usefulness (PU) showcases a positive relationship between them where $r=0.294$ and similarly with Perceived Ease of Use (PEU) it is 0.293 which shows a weak positive correlation between them. It signifies that those teachers who find using AI easy and useful they tend to use AI more often for teaching purpose but although the adoption is happening but it is not robust enough to reflect its impact on productivity. The correlation between using AI for academic purpose and productivity is moderately negative (-0.231) this seems counter intuitive but early-stage adopters often face learning curves or workflow disruption while integrating any new technology. So, the fall in productivity could be temporary while teachers adapt to new systems.

CONCLUSION

This study conducted by researcher concludes that although the university teachers has experienced a significant impact on productivity due to the adoption of Artificial Intelligence, it still depends on the fact that what level of expertise does the user has, the degree of preparedness the institution has to integrate Artificial Intelligence in the workspace, and continuous professional development. The results are indicative of the extent to which AI literacy should be cultivated, to mitigate the perceived risk by concentrating training and building structures that intellectually permits institutes to synchronize AI to institutional and instructional objectives. Since in the near future institute of higher learning will keep progressing with the use of AI, these lessons will be very instrumental in ensuring that AI achieves its full potential of revolutionizing academic productivity and efficiency of operations.

Despite the fact that under this research, I intend to make a valuable contribution to the initial implementation of AI in teaching staffs in the higher education establishments, there are certain limitations in this current research. The main drawback is that, the result of the quantitative study is based on the sample size ($n = 32$) which is considerably less in number, this limits the potential of the study to make a conclusion that is common for the larger population of the university teachers. The small number of respondents of the study could limit the variation of different institution contexts and fields.

Moreover, the research is based on self-reported data, which might reflect bias based on the respondent's

feelings, optimism bias, or limited experience with AI tools. The data is cross-sectional, limiting the ability to claim causation between the use of AI, perceive risk associated with AI, and productivity. In addition, since the study focuses on institutions considered to be in an early stage of using AI, the study is unable to demonstrate long term impacts of continued AI implementation.

Future researches in this area have a wider scope which can contribute in overcoming the limitations discussed above by utilizing a more bigger and diverse sample size of the population, adopting a longitudinal design in order to measure change over time, and or mixed methods (quantitative and qualitative) to explore behavioral and institutional context associated within a productivity orientation and Generative artificial intelligence being used in universities.

REFERENCES

1. Abuselidze, G., & Mamaladze, L. (2021, March). The impact of artificial intelligence on employment before and during pandemic: A comparative analysis. In *Journal of Physics: Conference Series* (Vol. 1840, No. 1, p. 012040). IOP Publishing.
2. Al Naqbi, H., Bahroun, Z., & Ahmed, V. (2024). Enhancing Work Productivity through Generative Artificial Intelligence: A Comprehensive Literature Review. *Sustainability*, *16*(3), 1166. <https://doi.org/10.3390/su16031166>
3. Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. *TechTrends*, *66*, 616 - 630. <https://doi.org/10.1007/s11528-022-00715-y>.
4. Chan, C. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, *20*. <https://doi.org/10.1186/s41239-023-00408-3>.
5. Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Access*, *8*, 75264-75278. <https://doi.org/10.1109/ACCESS.2020.2988510>.
6. Desk, I. T. E. (2025, July 30). 70% Indian teachers using AI tools, but many misunderstand it: survey. India Today. <https://www.indiatoday.in/education-today/latest-studies/story/70-indian-teachers-using-ai-tools-but-many-misunderstand-it-survey-2763565-2025-07-30>
7. Guibao, X., Yubo, M., & Jialiang, L. (2018). The impact of Artificial Intelligence on communication networks and services. *ITUJournal*, *1*(1), 33-38.

8. Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., Lekkas, D., & Palmer, E. (2024). The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. *Comput. Educ. Artif. Intell.*, 6, 100221. <https://doi.org/10.1016/j.caeai.2024.100221>.
9. Renkema, M., & Tursunbayeva, A. (2024). The Future of Work of Academics in the Age of Artificial Intelligence: State-of-the-art and a research Roadmap. *ELSEVIER*, 163, 103453. <https://doi.org/10.1016/j.futures.2024.103453>
10. Russel, S., & Norvig, P. *Artificial Intelligence: Modern Approach*, 2002. Prentice Hall.
11. Sarker, I. H. (2022). AI-based modeling: techniques, applications and research issues towards automation, intelligent and smart systems. *SN computer science*, 3(2), 158.
12. Suleman Ahmad, K., Sheetal, H., Hassan Jalil, H., Rida Anjum, S., Naveed, A., & Mohammed Ali, A. (2025). Implementing artificial intelligence in academic and administrative processes through responsible strategic leadership in the higher education institutions. *Frontiers in Education*, Volume 10-2025. <https://doi.org/10.3389/feduc.2025.1548104>
13. Szczepaniuk, H., & Szczepaniuk, E. K. (2022). Applications of artificial intelligence algorithms in the energy sector. *Energies*, 16(1), 347.