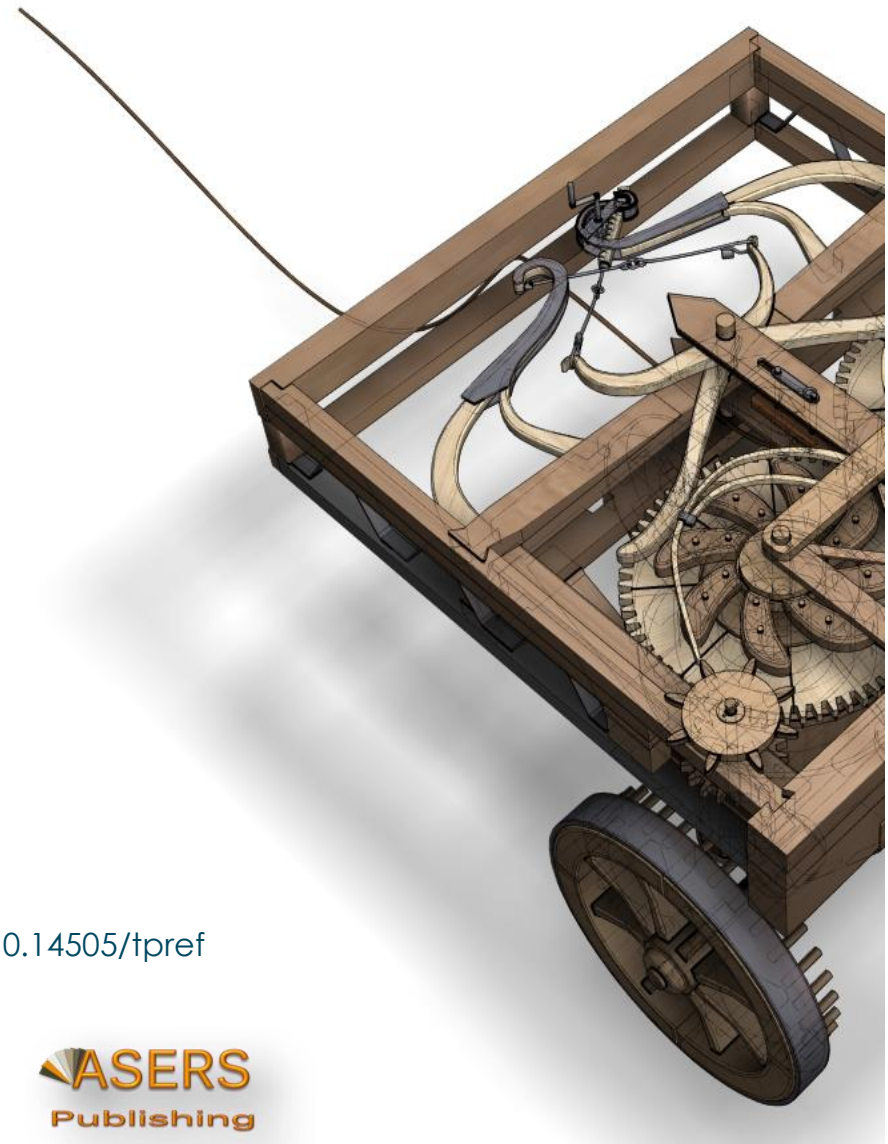
Theoretical and Practical Research in Economic Fields



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The Effectiveness of AI Chatbots in Business

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Abstract: Against the backdrop of digital business transformation, the present article delves into the efficacy of AI chatbots as a mechanism for enhancing sales on social media platforms. The relevance of this study is underscored by the rapid expansion of e-commerce and the imperative to refine marketing channels to sustain competitive advantage within the digital landscape. The purpose of the research is to quantify the chatbots' influence on key business metrics and to form an integral effectiveness index of their implementation. The methodology employed involves the calculation of an Integral Efficiency Index (IEI) through the application of weighting factors, normalization of business indicators to unify their scale, and the utilization of quantitative analysis alongside mathematical modeling techniques to interpret the results obtained. The study findings reveal that the use of AI chatbots leads to a 67% increase in sales, a 55% increase in qualified leads, and a 61% increase in staff productivity. The Integral Efficiency Index stands at 56.825%, signifying a substantial degree of synergy among the various components of efficiency. This study indicates that chatbots effectiveness is contingent upon the technology utilized and their integration within a company's operational processes. The developed IEI methodology facilitates a quantitative evaluation of chatbot implementation efficacy while also identifying growth areas for further technological interventions. The scientific novelty of the study lies in the development and testing of an integral index of AI chatbot effectiveness for a comprehensive assessment of the impact of technology on business processes.

Keywords: digital marketing; integral performance index; sales conversion; lead qualification; integration; productivity improvement.

JEL Classification: C61; D49; M39; A12.

Introduction

Against the backdrop of current landscape of digital communication, AI chatbots have evolved into a pivotal component of business strategies, revolutionizing customer interactions and enhancing sales efficacy through social media platforms. The rapid development of artificial intelligence and its seamless integration into communication channels unveil novel opportunities for enterprises of all sizes, facilitating a personalized approach to each client. As Mahdavi *et al.* (2023) elucidate, the use of AI chatbots has demonstrated remarkable effectiveness across diverse domains, including healthcare, education, and e-commerce, owing to their capacity to analyze extensive datasets and provide relevant answers in real time.

The integration of AI chatbots into social networks creates a new paradigm of interaction with customers, elevating communication to a qualitatively new level. According to a study by Li *et al.* (2023), chatbots that simulate friendly interactions substantially enhance customer engagement and brand loyalty, which directly impacts sales and conversion rates. Tailored recommendations, prompt responses to inquiries, and proactive engagement with prospective customers are emerging as competitive advantages for enterprises that incorporate AI solutions into their marketing strategies.

The scientific novelty of this research lies in developing a comprehensive Integral Efficiency Index for evaluating AI chatbot impact on key business metrics. Our approach integrates multiple dimensions of effectiveness into a cohesive analytical framework, enabling data-driven implementation decisions. The study's importance is highlighted by the rapidly expanding global AI chatbot market. Our research bridges gaps in existing literature by establishing a standardized methodology for evaluating chatbot performance across various business contexts.

An indispensable dimension of integrating AI chatbots within social networks lies in their capacity to gather and analyze data pertaining to user behavior, thereby facilitating the development of precise predictive models and tailored recommendations. As Leung (2023) underscores, the integration of AI and machine learning in social media enhances the efficacy of business processes and engenders novel opportunities for market analysis, as well as the customization of products to align with the preferences of the target audience.

The purpose of this study is to quantify the impact of AI chatbots on key business metrics and form an integral index reflecting the effectiveness of their implementation in sales through social networks. To accomplish this purpose, the following tasks were delineated: 1) analyze the current state and emerging trends in the use of AI chatbots within social media platforms; 2) identify the principal business metrics that characterize the effectiveness of AI bot implementation; 3) develop and validate a mathematical model for calculating the Integral Efficiency Index (IEI); 4) investigate the impact of various factors on the effectiveness of AI chatbots in the context of sales through social networks; 5) formulate recommendations for optimizing the use of AI chatbots to enhance sales performance.

1. Literature Review

An analysis of the scientific literature reveals a growing interest among researchers in the implementation and evaluation of the efficacy of AI chatbots across various business sectors, particularly within the context of social networks and e-commerce. Scholars are devoting considerable attention to examining the impact of AI technologies on customer interaction processes, fostering loyalty, and increasing conversion rates, as well as devising methodologies for assessing the effectiveness of such innovations.

Melnyk *et al.* (2022) underscore the paramount significance of ensuring that digital business tools adhere to regulatory requirements to foster sustainable entrepreneurship and mitigate corruption risks. Expanding upon this idea, Alazzam *et al.* (2023) assert that the development of digital platforms, particularly those incorporating AI chatbots, necessitates the creation of comprehensive information models that duly consider both technological aspects and legal compliance imperatives within the framework of global digitalization. This underscores the emergence of a holistic paradigm that encompasses not only the technological dimensions but also the regulatory and legal considerations of implementating AI solutions.

The psychological aspects of chatbot effectiveness are explored in a variety of complementary studies. For instance, Lin and Wu (2023) investigate the psychological mechanisms underlying the formation of relationships between consumers and brands through the strategic use of chatbots on social media platforms.

The authors underscore that the success of chatbots is largely contingent upon their capacity to create an emotional bond with users, which subsequently evolves into a sustained relationship with the brand. Notably, this theory is significantly enriched by Kim and Hur (2024), who enhance our comprehension of emotional factors and delve into specific elements that elicit users' empathy towards AI chatbots. They discovered that perceptions of

chatbots' competence and empathy profoundly influenced users' willingness to persist in their interactions and engage in purchasing behaviors.

It is worth mentioning that their findings resonate with those of Mei *et al.* (2024), who analyze the behavioral parallels between AI chatbots and humans, affirming that a pronounced degree of imitating human conduct markedly enhances user trust and interaction efficacy. Concurrently, alongside the psychological dimensions, the tangible influence of chatbots on business performance is explored in a number of studies. Kushwaha *et al.* (2021) investigate AI chatbots' impact on customer experience within the B2B sector, finding a substantial enhancement in the quality of customer interactions and a notable reduction in response times to inquiries. Similar findings, albeit within the B2C sector, were drawn by Rana *et al.* (2024), who showed that chatbots significantly improve user experience across all stages of the sales funnel.

The findings of Linina *et al.* (2022) corroborate our research, revealing that effective AI chatbot implementation significantly enhances consumer satisfaction across Baltic markets through personalized interactions and prompt response times. Additionally, Radionova *et al.* (2019) emphasizes the critical role of digital communication tools in establishing meaningful customer relationships within online dimensions, further supporting our assertion that AI chatbots represent a pivotal component of contemporary sales strategies.

Although concentrated on distinct market segments, both studies converge in their conclusion that AI technologies significantly enhance the quality of customer experience. In this context, Krishnan *et al.* (2022) and Fan (2023) examine the strategic dimensions of implementing chatbots. Accordingly, while Krishnan *et al.* (2022) focus on quantitative metrics and hold that organizations utilizing chatbots exhibit superior customer retention and sales conversion rates, Fan elaborates on this notion by positioning chatbots as a fundamental component of social media marketing strategies.

Current research highlights the strategic value of AI chatbots for modern businesses. An important ethical of the use of chatbots is revealed by Liu (2023), who the privacy issues associated with the of chatbots on social networks. The author notes that the collection and analysis of user data allow for the creation of highly personalized offers, but at the same time researchers underscore the strategic significance of AI chatbots for contemporary enterprises. An essential ethical dimension of utilizing chatbots is elucidated by Liu (2023), who examines the privacy concerns associated with using chatbots on social media platforms. The author observes that the aggregation and analysis of user data facilitate the crafting of exceptionally tailored offerings; however, this practice simultaneously raises serious questions regarding the safeguarding of personal information.

This ethical dilemma stands in stark contrast to Awad and Moosa (2023) pragmatic perspective, which focuses primarily on the cost-effectiveness of integrating AI technologies. This viewpoint underscores their pivotal role in optimizing business processes and minimizing operational expenditures. Our research endeavors to fill these gaps by developing an Integral Efficiency Index (IEI) that takes into account key business metrics and their relative significance across various business types.

2. Materials and Methods

2.1 Research Procedure

The initial stage of the research procedure entailed a comprehensive analysis of the prevailing state and emerging trends regarding the utilization of AI chatbots within social networks. To this end, statistical data was gathered from leading analytical sources, including Smartbot (2024), Dashly (2025), Reuters (2025), and Freshworks (2024), which elucidate chatbots' key performance indicators across diverse business contexts. At the second stage, the principal business metrics were discerned that most accurately characterize the effectiveness of implementing AI bots: sales growth, enhancement of qualified leads, improved conversion rates, return on investment, efficiency in lead qualification, and increased staff productivity. The third stage involved the evaluation and normalization of the obtained indicators for their subsequent incorporation into an integral index. The fourth stage comprised an expert assessment of the weighting coefficients attributed to each indicator, considering their relative significance within business processes. The concluding stage of the study encompassed the computation of the Integral Efficiency Index (IEI) employing the developed mathematical model, alongside the interpretation of the obtained findings.

2.2 Sample Formation

The study sample included statistical data regarding the efficacy of AI chatbots within social networks, sourced from reputable analytical entities for the years 2024-2025. In particular, data from Smartbot (2024) was analyzed to assess sales growth following the deployment of AI bots across corporate social channels. Metrics pertaining to the enhancement of qualified lead generation and the increase of conversion rates were derived from Dashly

(2025). Data on high ROI and lead qualification efficiency were produced based on research conducted by Cardillo (2024). Furthermore, statistics on the escalation of online sales in the United States during the 2024 holiday season were provided by Reuters (2025) and Salesforce. Freshworks (2024) contributed valuable data regarding user preferences in their interactions with chatbots. The sample also incorporated forecast data concerning the anticipated growth of the global AI chatbot market (Cardillo, 2024).

2.3 Methods

The study employed a diverse array of analytical methodologies to assess the effectiveness of AI chatbots in social media sales. The principal methodological framework was the computation of the Integral Efficiency Index (IEI), a metric that facilitates the synthesis of various business indicators taking into account their relative significance. The formula for calculating the IEI is articulated as follows:

$$IEI = \frac{\sum_{i=1}^{n}(w_i x_i)}{\sum_{i=1}^{n} w_i}$$

where:

– x_i — value of the i-th indicator (in percent);
– w_i — weight coefficient of this indicator's significance;
– n — number of indicators;
– $\sum w_i = 1$(or normalized during calculation).

The weighted evaluation method allowed considering the different importance of individual indicators for the overall effectiveness of AI bots. The weighting method was employed, which was based on an analysis of each indicator's relative impact on the overall business result. A method of normalizing indicators was employed to bring them to a single evaluation scale, which ensured the correctness of further aggregation.

For statistical analysis and interpretation of results, descriptive statistics and correlation analysis methods were used, which made it possible to identify relationships between individual performance indicators. The benchmarking method was used to compare the effectiveness of using chatbots by companies of various sizes, from small businesses to large corporations.

2.4 Tools

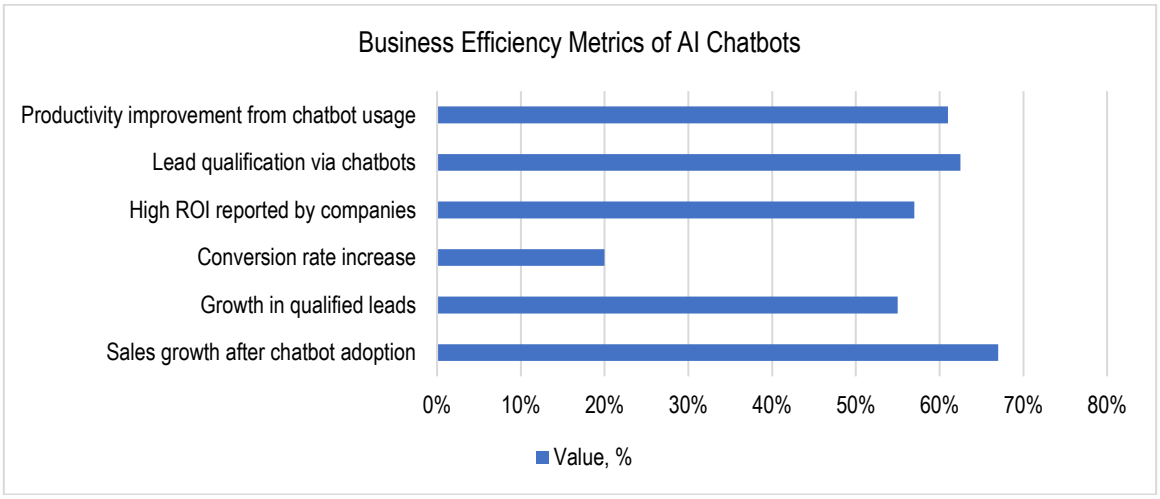
The study employed analytical tools to process and visualize statistical data. To compute the Integral Efficiency Index (IEI), Microsoft Excel was used, enabling the execution of essential mathematical calculations and the generation of tables with results.

3. Results

In the context of digital business transformation, AI chatbots have emerged as a pivotal instrument for automating customer service and an effective catalyst for enhancing sales on social networks. The integration of chatbots enables enterprises to facilitate instantaneous interactions with potential clients, substantially expediting the sales cycle and increasing conversion rates. According to Smartbot (2024), more than 67% of companies reported a marked increase in sales following the implementation of AI bots within their social media channels.

The chatbots' effectiveness is substantiated by the improvement of key business metrics. In this light, Dashly (2025) observes that 55% of enterprises experienced an increase in the volume of high-quality leads attributable to bots, while 20% noted an escalation in conversion rates. The integration of artificial intelligence facilitates the customization of communication strategies tailored to specific audiences and contexts. The automated collection of data, coupled with the anticipation of user needs, transforms a chatbot into a responsive and proactive sales tool. The key business metrics of AI chatbots that were used in calculating the composite index as illustrated in Figure 1.

Figure 1. Business Efficiency Metrics of AI Chatbots

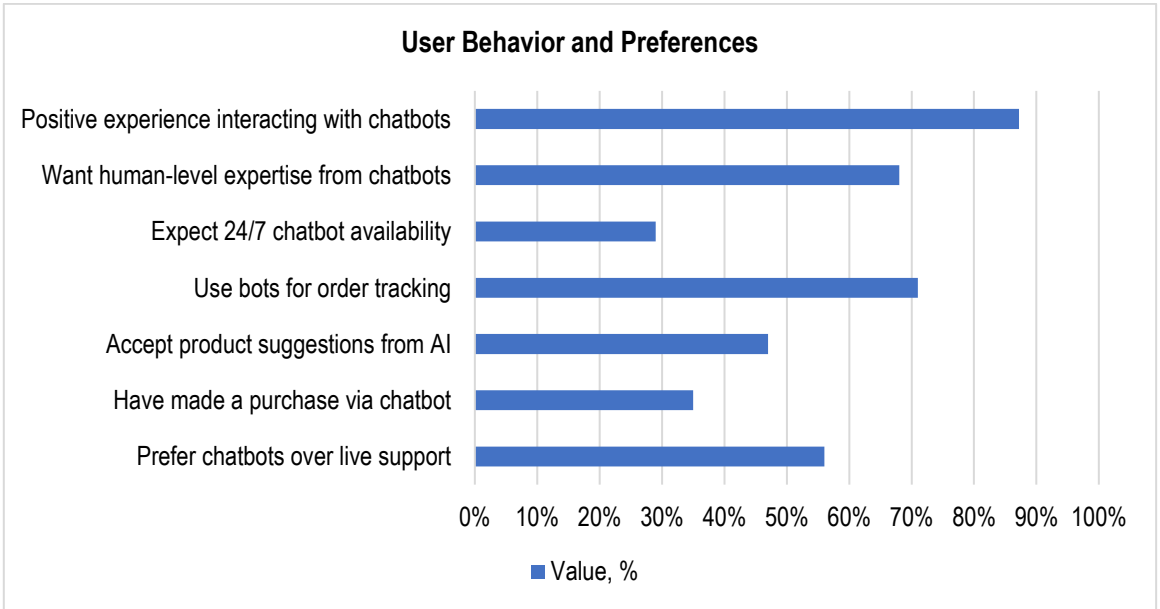


Source: developed by the authors based on Dashly (2025), Shrivastava (2024)

The use of AI bots across social networks such as Facebook, Instagram, and WhatsApp yields increasingly noticeable outcomes. Meta is actively integrating AI features into its messengers, thereby enhancing audience engagement and diminishing the costs associated with customer acquisition (Reuters, 2025). According to Salesforce, the implementation of chatbots on social media resulted in a 4% surge in online sales in the United States alone during the 2024 holiday season, a period when the market is particularly attuned to the efficacy of sales channels. While AI bots in social networks represent a technological trend, they also serve as an economically justified tool.

In addition to directly influencing profitability, chatbots optimize response times, increase customer satisfaction, and facilitate the scaling of services without necessitating the recruitment of additional personnel. Freshworks (2024) cites data indicating that 71% of users favor engaging with chatbots to obtain prompt information regarding their orders. As illustrated in Figure 2, the preferences of social media users indicate a growing trend towards interactions with AI chatbots during online purchasing experiences.

Figure 2. User Behavior and Preferences



Source: developed by the authors based on Dashly (2025), Shrivastava (2024)

The global AI chatbot market is experiencing robust growth, with projections indicating an increase from $15.6 billion in 2025 to $46.6 billion by 2029 (Cardillo, 2024). This expansion can be attributed to the rapid advancements in natural language processing (NLP) technologies, as well as the surging popularity of integrated communications within social media platforms. Companies that have already adopted chatbot solutions are not

only reducing operational costs but also securing a competitive edge by facilitating continuous engagement with their customers. The integration of chatbots effectively addresses the challenges of multi-channel marketing. In numerous enterprises, customers interact simultaneously across platforms such as Instagram Direct, WhatsApp, and Facebook Messenger, and owing to AI algorithms, these requests can be synchronized.

The segment of small and medium-sized enterprises deserves particular consideration. These entities possess the remarkable ability to scale their operations with minimal expenditure. For such organizations, as noted by Dashly (2025), a chatbot transcends mere automation; it emerges as survival tool within a fiercely competitive digital landscape. Streamlining the sales process, mitigating the "losses" of potential customers, and increasing response speed is critically important for small businesses.

In conclusion, it is worth emphasizing that the effectiveness of AI chatbots depends on technology and integration with the company's business processes. Based on customer behavioral analysis, we achieve significantly better results. In the coming years, chatbots will become not an option, but the standard for sales on social networks, and those that adapt these solutions today. In conclusion, it is imperative to underscore that the efficacy of AI chatbots is contingent upon technology and its seamless integration with the inmpany's operational processes. Businesses that build an implementation strategy grounded in the analysis of customer behavior realize markedly superior outcomes. In the forthcoming years, chatbots will transition from being an optional tool to an essential standard for sales on social networks, and those companies that embrace these solutions today will shape the future of the market.

In the context of digital transformation of the companies that sell via social networks, it is imperative to reasonably assess the viability of investments in artificial intelligence. The development of an integral efficiency index (IEI) allows for a generalized assessment based on key business metrics that exert a direct influence on the company's financial and operational performance. The use of weighting coefficients within the IEI model enables to adjust the overall impact of each factor according to its real weight in making management decisions.

The integrated model includes six key metrics: sales growth, qualified lead growth, conversion improvement, high return on investment (ROI), lead qualification efficiency, and staff productivity growth. Data obtained from sources Shrivastava (2024), Dashly (2025), and Cardillo (2024) were normalized and correlated with appropriate weights. The outcomes of calculating AI chatbots' integral efficiency index by key business metrics are presented in Table 1.

Table 1. Integrated Weighted Index of AI Chatbot Efficiency Based on Key Business Metrics in Social Commerce (2024–2025)

No.	Indicator	x_i (%)	w_i (%)
1	Sales growth	67	0.25
2	Qualified leads growth	55	0.20
3	Conversion rate increase	20	0.10
4	High ROI	57	0.15
5	Lead qualification via chatbots	62.5	0.15
6	Productivity improvement	61	0.15
	Total		1.00

Source: calculated by the authors

The indicators incorporated in the IEI calculation encompass the principal functional dimensions of chatbots within the digital sales ecosystem: ranging from the generation of initial demand to the realization of financial outcomes. The sales growth metric accounting for 67% illuminates the direct chatbot's influence on sales volume, while the increase of qualified leads accounting for 55% reflects the effectiveness of automated primary audience segmentation.

The productivity index of 61% demonstrates the degree of workload redistribution from personnel to AI agents, facilitating operational savings while preserving service quality. The IEI model is fundamentally built on weighted normalization, which offers a balanced assessment of each indicator's impact within the overarching performance framework. Modifying the coefficients or integrating new metrics, such as average response time or the extent of personalization, enables the IEI recalibration to account for emerging bot architectures, be they rule-based, hybrid, or neural network.

Due to the ability to change weighting factors depending on industry specifics or business scale, this model shows sufficient flexibility in application. In small businesses, productivity may carry more weight, while in large corporations the emphasis shifts to ROI and lead quality. The IEI model's adaptability makes it an effective

tool for analytical assessment in terms of digital business transformation. The calculations are performed as follows and the obtained values are recorded in Table 2.

Table 2. Final IEI Calculation Based on Weighted Business Metrics of AI Chatbot Implementation

Indicator	$x_i(\%)$	w_i	$w_i x_i$
Sales growth	67	0.25	16.75
Qualified leads growth	55	0.20	11.00
Conversion rate increase	20	0.10	2.00
High ROI	57	0.15	8.55
Lead qualification via chatbots	62.5	0.15	9.375
Productivity improvement	61	0.15	9.15
Total IEI	—	1.00	56.825

Source: calculated by the authors

The integral performance index, derived from key business metrics, elucidates the overarching effectiveness of integrating AI chatbots in the field of social sales. The indicator of 56.825% signifies a pronounced synergy among the constituent components of effectiveness, including increased productivity, enhanced lead generation, improved ROI, and increased conversion rates. It is imperative to underscore that the remarkable sales growth of 67% not only reflects a short-term impact but also serves as compelling evidence of chatbots' strategic influence on business model's comprehensive transformation.

A well-founded weighting of indicators makes it possible to form an objective and balanced assessment that takes into account both financial aspects (ROI, sales) and operational aspects (productivity, lead qualification). The combination is especially valuable for management decisions in small and medium-sized enterprises, where resources are limited and efficiency must be maximized without large-scale investments.

The IEI index indicates a high, but not limitless, level of effectiveness of implementing AI chatbots in sales via social networks. The indicator indicates that most key business metrics, including 67% sales growth, 62.5% lead qualification improvement, and 61% productivity improvement, illustrate a consistent and favorable impact stemming from the implementation of chatbots. However, at 20%, conversion rates remain comparatively underdeveloped.

The IEI methodology provides the opportunity to quantitatively assess the impacts across diverse domains for further technological or strategic interventions. Its practical value is evidenced in the analytical endeavors of marketing teams, the assessment of digital investments, and change management within CRM systems.

4. Discussions

The study elucidated that AI chatbots markedly enhance the efficacy of sales through social networks. This assertion is substantiated by the research conducted by Milan *et al.* (2023), which illustrates how the integration of AI technologies in social marketing amplifies customer engagement and elevates conversion rates. Our findings align with the conclusions of Pratika (2023), who posits that the use of artificial intelligence in social media marketing fosters increased sales and enhances customer loyalty. Nonetheless, Ocal (2023) maintains that the ethical implications surrounding the utilization of AI in social media raise concerns among users, potentially limiting chatbots' effectiveness. Our study confirms the findings of Redondo *et al.* (2023) that AI technologies allow for the identification and adaptation of communication strategies tailored to diverse user profiles. Zappavigna's (2023) research confirms that leveraging AI for social media data analysis significantly enhances message targeting, a finding that resonates with our results regarding the increasing the lead qualification efficiency. Sufi (2023) underscores the promise of social media analytics powered by AI in discerning factors that influence consumer behavior, a notion that is reinforced by our research. As stated by Roche *et al.* (2023), a holistic approach for the integration of AI into business processes guarantees the optimization of customer interactions, which is consistent with our conclusions regarding comprehensive performance assessment. Greenfield and Bhavnani's (2023) observations regarding the potential hazards of excessive automation in communications support our recommendations for a balanced approach to implementing AI chatbots. Ortina *et al.* (2023) assert that digital advancement necessitates effective public administration, a claim that is in line with our findings on the imperative for a strategic framework in utilizing AI technologies. Alazzam *et al.* (2023) emphasizes the significance of developing information models for e-commerce within the global digitalization context, a perspective that aligns with our methodology for establishing an integral efficiency index. Thus, AI chatbots are indeed a key element in contemporary social media sales strategies, but their full use

requires a comprehensive approach to assessing effectiveness, alongside careful consideration of the ethical dimensions of user interaction.

Limitations

Despite the integrity of the research undertaken, there exist limitations regarding the universality of the developed Integral Efficiency Index (IEI) across diverse industries and varying business scales. The established weighting factors may vary depending on the market's specifics and the target demographics, necessitating further methodology's adaptation to suit specific business contexts. It is noteworthy that the study predominantly relied on statistical data from 2024-2025, which may not fully reflect long-term trends in the evolution of AI technologies within social networks. A comprehensive analysis of the AI chatbots' effectiveness should encompass both large corporations as well as small to medium-sized enterprises to ensure the study rigour.

Recommendations

Drawing upon the conducted research, the following directions for further inquiry are delineated:

1.Examine the influence of psychological factors on the perception of AI chatbots across diverse consumer segments, with the aim of formulating more effective communication strategies within social networks.

2.Expand the methodology for assessing the effectiveness of AI chatbots, taking into account industry specifics and the scale of enterprises.

3.Conduct longitudinal studies to assess the impact of AI chatbots on customer loyalty and the customer lifecycle, thereby elucidating the long-term implications of communication automation.

4.Delve into the ethical dimensions of employing AI in social networks, particularly regarding personal data protection and the transparency of user interactions.

Conclusions and Further Research

Therefore, the integration of AI chatbots into social media sales emerges as a key factor for enhancing business efficiency within the framework of digital transformation. The analysis revealed that the utilization of AI bots substantially increases sales volumes (by 67%), elevates the number of qualified leads (by 55%), and augments staff productivity (by 61%). The developed integral efficiency index (IEI) with a value of 56.825% indicates a pronounced level of synergy among the diverse facets of chatbot influence on business processes. The incorporation of weighting factors facilitates an objective evaluation of the effectiveness of AI technology implementation, considering the relative significance of various business indicators.

The study findings confirm that organizations, strategically incorporating AI chatbots into their marketing paradigms, derive significant competitive advantages through enhanced customer interactions, elevated conversion rates, and optimized business processes. The effectiveness of AI bots is contingent upon technological aspects and their integration with business operations and overarching corporate strategy. To maximize efficiency, it is imperative to strike a harmonious balance between automation and a personalized approach to customer engagement, while also considering the ethical implications of employing AI within social media platforms. Prospective avenues for research should encompass an exploration of the ramifications of integrating generative AI and augmented reality technologies on the effectiveness of customer interactions in social networks, as well as the formulation of specific methodologies for evaluating effectiveness across diverse industries and business scales.

Credit Authorship Contribution Statement

Sergiy Spivakovskyy: Conceptualization, Validation, Project administration.
Alina Danileviča: Investigation, Writing – review and editing, Methodology.
Volodymyr Samchuk: Writing – original draft, Software.
A. S. Fomin: Formal analysis, Data curation.
Kostyantin Milonushkin: Supervision, Visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI (a type of artificial intelligence technology that can produce various types of content including text, imagery, audio and synthetic data.

References

[1] Alazzam, Farouq Ahmad Faleh, Hisham Jadallah Mansour Shakhatreh, Zaid Ibrahim Yousef Gharaibeh, Iryna Didiuk, and Oleksandr Sylkin. (2023). Developing an information model for E-Commerce platforms: A study on modern socio-economic systems in the context of global digitalization and legal compliance. *Ingenierie des Systemes d'Information,* 28(4): 969–974. DOI: https://doi.org/10.18280/isi.280417

[2] Awad, W., and J. Moosa. (2024). Implications of AI chatbots in education: Challenges and solutions. *Journal of Statistics Applications and Probability,* 13(2): 611–622. DOI: https://doi.org/10.18576/jsap/130203

[3] Cardillo, Anthony. (2024). Chatbot statistics: Usage, growth & future trends. Available at: https://explodingtopics.com/blog/chatbot-statistics

[4] Dashly. (2025). The 36 key Chatbot statistics: How chatbots help businesses grow in 2025. Available at: https://www.dashly.io/blog/chatbot-statistics/

[5] Fan, Xiruo. (2023). Social media marketing strategies. *Advances in Economics, Management and Political Sciences,* 23(1): 59–64. DOI: https://doi.org/10.54254/2754-1169/23/20230353

[6] Greenfield, David, and Shivan Bhavnani. (2023). Social media: generative AI could harm mental health. *Nature* 617(676). DOI: https://doi.org/10.1038/d41586-023-01693-8

[7] Kim, Woo Bin, and Hee Jin Hur. (2024). What makes people feel empathy for AI chatbots? Assessing the role of competence and warmth. *International Journal of Human-Computer Interaction,* 40(17): 4674–4687. DOI: https://doi.org/10.1080/10447318.2023.2219961

[8] Krishnan, Chitra, Aditya Gupta, Astha Gupta, and Gurinder Singh. (2022). Impact of Artificial intelligence-based chatbots on customer engagement and business growth. *Deep Learning for Social Media Data Analytics* (pp. 195–210). Springer Science and Business Media Deutschland GmbH. DOI:https://doi.org/10.1007/978-3-031-10869-3_11

[9] Kushwaha, Amit Kumar, Prashant Kumar, and Arpan Kumar Kar. (2021). What impacts customer experience for B2B enterprises on using AI-enabled chatbots? Insights from Big data analytics. *Industrial Marketing Management,* 98: 207–221. DOI: https://doi.org/10.1016/j.indmarman.2021.08.011

[10] Leung, Ricky. (2023). Using AI–ML to augment the capabilities of social media for telehealth and remote patient monitoring. *Healthcare,* 11(12): 1704. DOI: https://doi.org/10.3390/healthcare11121704

[11] Li, Baoku, Ruoxi Yao, and Yafeng Nan. (2023). How do friendship artificial intelligence chatbots (FAIC) benefit the continuity using intention and customer engagement? *Journal of Consumer Behavior,* 22(6): 1376–1398. DOI: https://doi.org/10.1002/cb.2218

[12] Lin, Jhih-Syuan, and Linwan Wu (2023). Examining the psychological process of developing consumer-brand relationships through strategic use of social media brand chatbots. *Computers in Human Behavior,* 140: 107488. DOI: https://doi.org/10.1016/j.chb.2022.107488

[13] Linina, Ineta Renate Zvirgzdina, and Vevere Velga. (2022). Ensuring consumer satisfaction with chatbots in the Baltic states. *Proceedings of the International Scientific Conference "Business and Management 2022"* (pp. 511–516). Vilnius Gediminas Technical University. DOI: https://doi.org/10.3846/bm.2022.733

[14] Liu, Yage. (2023). AI chatbots in social media: Ethical responsibilities and privacy challenges of information and communication technology. *ACM International Conference Proceeding Series* (pp. 96–99). Association for Computing Machinery. DOI: https://doi.org/10.1145/3625469.3625483

[15] Mahdavi, Abdollah, Masoud Amanzadeh, Mahnaz Hamedan, and Roya Naemi. (2023). Artificial intelligence-based chatbots to combat COVID-19 pandemic: A scoping review. *Shiraz E-Medical Journal,* 24(11): e139627. DOI: https://doi.org/10.5812/semj-139627

[16] Mei, Qiaozhu, Yutong Xie, Walter Yuan, and Matthew O. Jackson. (2024). A Turing test of whether AI chatbots are behaviorally similar to humans. *Proceedings of the National Academy of Sciences of the United States of America,* 121(9): e2313925121. DOI: https://doi.org/10.1073/pnas.2313925121

[17] Melnyk, Dmytro S., Oleg A. Parfylo, Oleksii V. Butenko, Olena V. Tykhonova, and Volodymyr O. Zarosylo. (2022). Practice of the member states of the European Union in the field of anti-corruption regulation. *Journal of Financial Crime* 29(3): 853–863. DOI: https://doi.org/10.1108/JFC-03-2021-0050

[18] Milan, Ankush, Rakesh Sahu, and Jasminder Kaur Sandhu. (2023). Impact of AI on social marketing and its usage in social media: A review analysis. *Proceedings of the International Conference on Circuit Power and Computing Technologies (ICCPCT)* (pp. 1749–1754). Institute of Electrical and Electronics Engineers Inc. DOI: https://doi.org/10.1109/ICCPCT58313.2023.10245676

[19] Ocal, Ayse. (2023). Perceptions of AI ethics on social media. *IEEE International Symposium on Ethics in Engineering, Science, and Technology (ETHICS)*. IEEE (USA). DOI: 10.1109/ethics57328.2023.10155069

[20] Ortina, Ganna, Diana Zayats, Liudmyla Akimova, Oleksandr Akimov, and Marta Karpa. (2023). Economic efficiency of public administration in the field of digital development. *Economic Affairs,* 68(3): 1543–1553. DOI: https://doi.org/10.46852/0424-2513.3.2023.21

[21] Pratika, Yeyen. (2023). The effect of artificial intelligence utilizing social media marketing. *Jurnal Manajemen Universitas Bung Hatta* 18(2): 245–253. DOI: https://doi.org/10.37301/jmubh.v18i2.23211

[22] Radionova, Elena, Anita Batraga, and Jekaterina Salkovska. (2019). The determinants of online shopping: building communication with customers in an online dimension. *Proceedings of the International Scientific Conference "Economic Science for Rural Development"* 51: 330–337. DOI: 10.22616/esrd.2019.093

[23] Rana, Jyoti, Ruchi Jain, and Vibha Nehra. (2024). Utility and acceptability of AI-enabled chatbots on the online customer journey in e-retailing. *International Journal of Computing and Digital Systems,* 15(1): 323–335. DOI: https://doi.org/10.12785/ijcds/150125

[24] Redondo, Rebeca P. Díaz Díaz, *et al.* (2023). Anti-sexism alert system: Identification of sexist comments on social media using AI techniques. *Applied Sciences,* 13(7): 4341. DOI: https://doi.org/10.3390/app13074341

[25] Roche, Valentin, Jean-Philippe Robert, and Hanan Salam. (2023). A holistic AI-based approach for pharmacovigilance optimization from patient behavior on social media. *Artificial Intelligence in Medicine,* 144: 102638. DOI: https://doi.org/10.1016/j.artmed.2023.102638

[26] Shrivastava, Namita. (2024). Chatbot statistics that will blow your mind in 2024. Available at: https://www.smatbot.com/blog/chatbot-statistics-that-will-blow-your-mind-in-2024/

[27] Sufi, Fahim. (2023). A new social media analytics method for identifying factors contributing to COVID-19 discussion topics. *Information (Switzerland),* 14(10): 545. DOI: https://doi.org/10.3390/info14100545

[28] Zappavigna, Michele. (2023). Hack your corpus analysis: How AI can assist corpus linguists deal with messy social media data. *Applied Corpus Linguistics,* 3(3). DOI: 10.1016/j.acorp.2023.100067

[29] Freshworks. (2024). 20 essential chatbot statistics to explore in 2024. Available at: https://www.freshworks.com/chatbots/statistics/

[30] Reuters. (2025). AI-influenced shopping boosts online holiday sales, Salesforce data shows. Available at: https://www.reuters.com/business/retail-consumer/ai-influenced-shopping-boosts-online-holiday-sales-salesforce-data-shows-2025-01-06/

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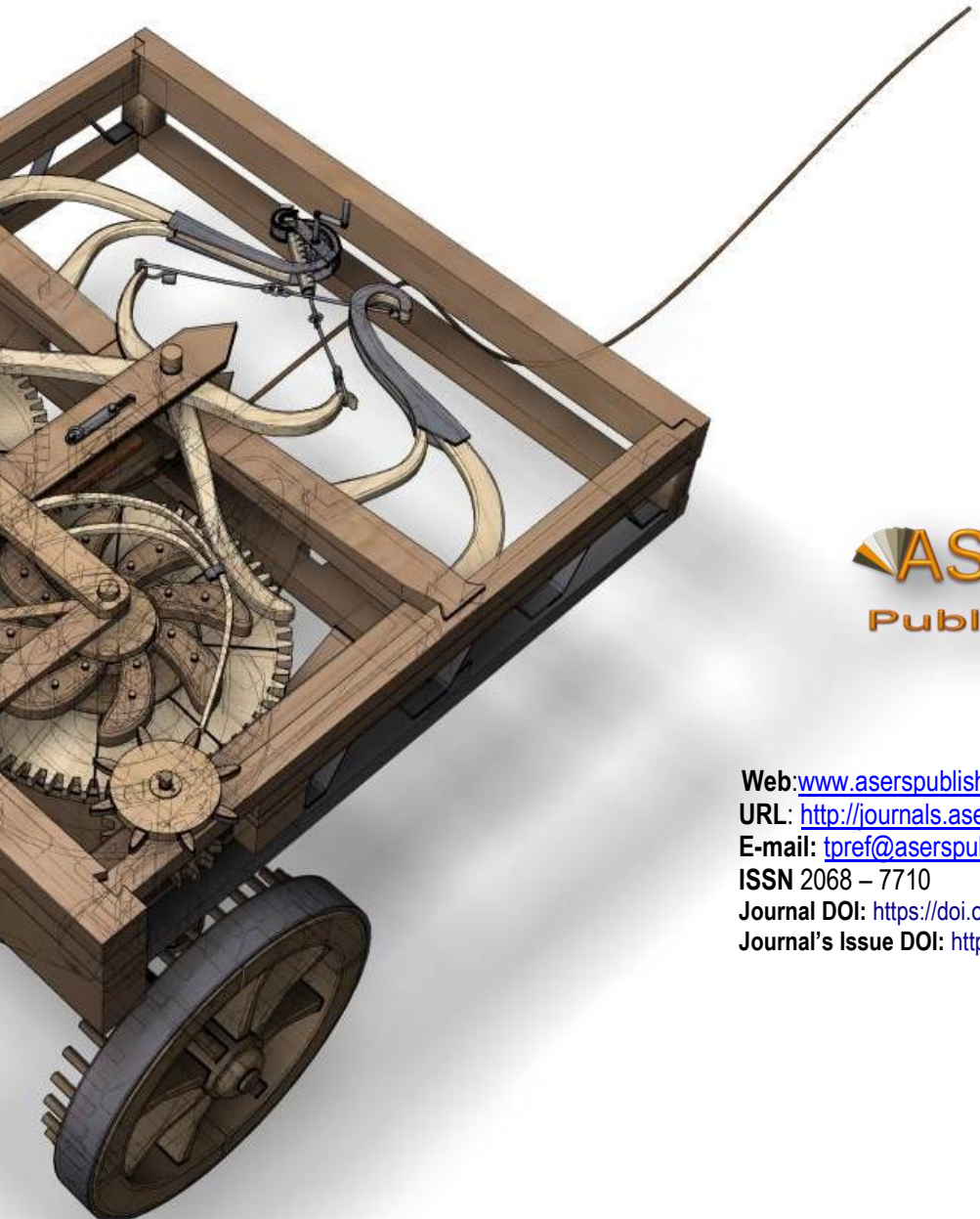

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