

## ENHANCEMENT OF INTERNAL BUSINESS PROCESS USING ARTIFICIAL INTELLIGENCE

Joseph Teguh Santoso<sup>1</sup>, Agus Wibowo<sup>2</sup>, Budi Raharjo<sup>3</sup>

<sup>1,2,3</sup>Department of Computer Science, University of Science and Computer Technology

email: joseph\_teguh@stekom.ac.id<sup>1</sup>, agus.wibowo@stekom.ac.id<sup>2</sup>, budiraharjo@stekom.ac.id<sup>3</sup>

### Abstract

This paper explores the feasibility and application of Artificial Intelligence (AI) in optimizing Internal Business Processes (IBPs) within various industries. Despite the rapid advancements in AI technology, its adoption in IBPs remains limited, with many companies facing challenges such as insufficient understanding, managerial support, and technical resources. This study employs a mixed-methods approach, incorporating both quantitative surveys and qualitative interviews to gain comprehensive insights into the current state of AI integration in IBPs. The survey results highlight a significant gap between the perceived potential of AI and its actual implementation, while the interviews reveal key themes such as digitization, process improvement, and ethical considerations. The findings emphasize the need for structured process modeling, clear responsibility definitions, and continuous training to ensure successful AI integration. This research contributes to the existing literature by focusing on the underexplored area of AI in IBPs and proposes a framework for systematic AI adoption, addressing both technical and ethical challenges. Future research should explore the long-term effects of AI on employee satisfaction and productivity.

**Keywords:** Artificial Intelligence, Internal Business Processes, AI Adoption, Process Improvement, Ethical Considerations

---

Received: 29-05-2024 | Revised: 09-08-2024 | Accepted: 15-08-2024  
DOI: <https://doi.org/10.23887/janapati.v13i3.79242>

---

### INTRODUCTION

Over the past century, Artificial Intelligence (AI) has evolved from a hypothetical concept to a feasible and applicable technology. In recent years, companies have generated data at an unprecedented rate, and utilizing this vast amount of data to enhance business procedures and decision-making is crucial for staying competitive. Despite the hype surrounding AI, few projects have delivered business value, with an estimated 85% failure rate in AI projects [1], [2]. This highlights the challenges companies face in effectively adopting and integrating AI into their business processes [3], [4].

Existing research has primarily focused on specific use cases of AI in areas such as marketing [5], [6], customer service [7], [8], and manufacturing [9], [10]. These studies have shown how AI can improve efficiency and effectiveness in outward-facing processes. However, there is a lack of comprehensive studies on the application of AI in Internal Business Processes (IBP), which are crucial for maintaining the internal operations of a company and indirectly achieving overall business profit goals [11], [12]. IBPs are the internal gears that

allow companies to execute their core business activities. Enhancing these processes can have significant implications for companies and the way they conduct business [13].

Business process optimization, although frequently defined with less precision and more tacit knowledge in nature, has become an area of interest. However, like AI initiatives, process optimization endeavors in business are susceptible to collapse because of deficient managerial and staff buy-in and deficiencies in communication [14]. Moreover, while numerous methodologies and tools such as Business Process Reengineering (BPR) [15], [16], [17] and Lean Six Sigma [18], [19] have been proposed and implemented for process improvement, the high failure rate of these projects suggests a need for better integration and understanding of AI technologies within these frameworks.

Despite the potential benefits, there is a significant gap in the literature regarding the practical application of AI in optimizing IBPs. Most existing studies either focus on external-facing processes or specific technologies without addressing the holistic integration of AI in internal processes. This study aims to bridge this gap by

exploring the feasibility of AI-enabled process improvement systems to assist businesses in optimizing their IBPs.

The novelty of this research lies in its focus on the practical application of AI in optimizing IBPs, which has been underexplored in previous studies. By investigating the current state of AI adoption in internal processes and identifying the factors that influence its success, this study aims to provide valuable insights for companies looking to leverage AI for process improvement and ultimately enhance their business performance.

## METHOD

This research employed a mixed-methods approach with both quantitative and qualitative research techniques to achieve a comprehensive understanding of AI-enabled process improvement in Internal Business Processes (IBP).

### Survey Design

The quantitative aspect of the research involved conducting surveys targeting participants with technical or managerial backgrounds. The survey aimed to identify the current use of AI in IBP and determine in which processes AI is most prevalent. The survey design included multiple-choice and open-ended questions to capture both quantitative data and qualitative insights. Participants were selected from various industries to ensure a diverse range of perspectives

### Interview Design

Following the survey, semi-structured interviews were conducted with individuals directly involved in AI applications within their companies. The interviews aimed to gain deeper insights into specific AI applications and their impacts on IBP. The interview questions were designed to explore the participants' experiences with AI, the challenges they faced, and the benefits they observed.

### Data Collection and Process

The quantitative research involved a survey designed to identify where AI is being used and in which IBPs AI is most prevalent. The survey was administered using Google Forms and included 18 participants over one month. Participants, primarily individuals with a technical background or those in upper management positions familiar with their company's technical solutions, were given the option to identify only their industry to adhere to privacy regulations [20], [21], [22]. The survey questions focused on the participant's current occupation, the definition of AI in a business context, and the level of AI usage within their organization.

Based on the survey results, qualitative data were collected through semi-structured interviews with five participants, including managers and technical experts from various industries. The interviews aimed to provide detailed insights into how businesses are currently using AI applications to achieve business benefits. Each interview followed a set of guidelines to ensure consistency and was transcribed for analysis [23]. The interview questions explored topics such as digitization, process improvement, and the specific roles of AI in business operations.

### Data Source

The study involved 18 survey participants and 5 interviewees from different industries, including software, the financial sector, and IT consulting. Google Forms was used to administer the survey, while semi-structured interviews were conducted to allow flexibility and depth in responses.

### Analysis Method

Survey data were analyzed using descriptive statistics to summarize the present status of AI adoption in IBPs, providing a broad overview of AI usage across different industries and highlighting the lack of literature on internal processes that facilitate job performance. Interview transcriptions were coded and analyzed to identify recurring themes and patterns. This qualitative data provided detailed insights into the knowledge and perspectives of managers and technical experts regarding AI applications in IBPs.

Table 1. Survey results on AI Adoption in IBPs

AI Definition	Frequency
Automation	9
Data	9
Future	7
Processes	5
Machine Learning	5
Assistance	4
Decision-making	3
Algorithms	3
Insights	3
Self-learning	3
Problem-solving	2
Speed	3
Data collection	2
Efficiency	1
Pattern	3
Execution	1
Natural Intelligence	1
Human Intelligence	1
Coding	2
Calculation	1

Themes such as digitization, process improvement, and AI integration were explored in depth to understand the practical challenges and benefits of using AI in internal business processes.

**Ethical Consideration**

Given the increasing frequency of cyberattacks, ensuring data integrity and security was a crucial aspect of this research. According to the guidelines outlined by [20], [21], [22], proper precautions were taken to protect data privacy and ethics. The study adhered to ethical standards by anonymizing participant information and securing all collected data.

**RESULT AND DISCUSSION**

The results of this study are derived from both the quantitative survey and qualitative interviews conducted. The survey data were analyzed using descriptive statistics to provide an overview of AI adoption in Internal Business Processes (IBPs). The survey involved 18 participants from various industries, including software, financial sector, and IT consulting. The survey questions focused on the participants' current occupation, the definition of AI in a business context, and the level of AI usage within their organization.

The findings indicate that a significant portion of respondents, particularly those in management and technical roles, have a varying understanding of AI and its applications in IBPs. The survey results showed that while AI is

commonly associated with automation and data processing, its integration into IBPs is still in the early stages for many companies. This highlights the need for better awareness and education about AI's potential benefits in internal processes.

The qualitative interviews provided deeper insights into how businesses are currently using AI applications to achieve business benefits. The five participants, including managers and technical experts, discussed their experiences with AI in their respective companies. The interviews revealed several key themes:

**Digitization and AI Engagement**

All companies surveyed utilize advanced communication analytics and collaboration technologies, with varying levels of engagement with AI. This ranges from using AI for task automation to more complex applications such as predictive analytics and customer behavior analysis.

PS1 described their company as heavily reliant on advanced communication tools and analytics. They use AI primarily for task automation and improving operational efficiency. However, PS1 noted challenges in integrating AI with existing systems due to a lack of technical expertise among some staff members.

PS2 highlighted the use of AI in predictive analytics and fraud detection. They mentioned that AI has significantly improved their ability to detect fraudulent activities in real time, but there are concerns about data privacy and the need for robust security measures.

Table 2. Survey results on AI Adoption in IBPs

Participant Code	Understanding of Process Modeling	Motivation for Process Improvement
PS1	Considered process as a project term; lacks complete process model due to time/resource constraints	Motivated by customer demands and desire to improve customer service
PS2	High-level definition of processes like order-to-cash; lacks comprehensive process models	Driven by the necessity to meet customer requirements and improve service delivery
PS3	Concrete processes like receiving and paying bills; lack full process models	Focused on enhancing customer satisfaction and operational efficiency
PS4	No process at all; variable understanding of process modeling	Primarily motivated by customer feedback and competitive pressure
PS5	Relies on manual/ad-hoc methods; interested in formal process improvement methodologies	Aims to achieve higher efficiency and better quality management

PS3 discussed the use of AI in customer behavior analysis. They emphasized the importance of understanding customer needs and preferences, which AI helps to achieve. However, PS3 pointed out the difficulty in maintaining data accuracy and the challenges in ensuring data integrity.

#### **Process Improvement Approach**

Companies have different approaches to managing their business processes. While some have clear infrastructure and software development processes, others rely on more manual or ad-hoc methods. The consensus among participants was that proper process modeling can help improve company performance by ensuring every team member understands the overall process and its phases.

PS4 relies on manual and ad-hoc methods for process improvement. They noted that while these methods are flexible, they lack the consistency and efficiency provided by structured process modeling. PS4 expressed interest in adopting more formalized process improvement methodologies.

PS5 has clear infrastructure and software development processes in place. They use AI to streamline internal operations and improve process efficiency. PS5 mentioned the importance of employee training and continuous improvement to maximize the benefits of AI integration.

#### **AI Integration**

Table 3 summarizes the survey results on AI adoption in IBPs. The research findings indicate that the application of AI in Internal Business Processes (IBPs) varies across companies, depending on the industry, business scale, and technological readiness. For instance, PS1 demonstrated a high level of AI usage (70%), particularly in software development and fraud detection. This suggests that companies in the software sector tend to leverage AI in their operations, which require intensive automation and data analysis. However, PS1 also highlighted significant challenges in integrating AI into existing systems, primarily due to the lack of technical expertise among some staff members. This indicates that while AI offers substantial potential to enhance efficiency and effectiveness, internal challenges such as the readiness of human resources and technological infrastructure are major obstacles.

In contrast, PS4, representing small and medium-sized enterprises (SMEs), reported a lower level of AI usage (40%), indicating that smaller-scale businesses face more barriers to fully adopting AI technology. AI in these SMEs is applied on a more limited scale, such as in

software development and online marketing, which may not require the same level of sophistication as larger companies. This reflects that AI adoption in smaller companies is often constrained by factors such as limited resources, lack of managerial support, and insufficient understanding of AI's potential.

Furthermore, the findings from PS2 and PS3 emphasize the importance of AI in predictive analytics and customer behavior analysis, which are key components in the financial and IT consulting sectors. However, PS3 underscored the difficulty in maintaining data accuracy and the challenges in ensuring data integrity when utilizing AI. This indicates that while AI can provide valuable insights, its successful implementation heavily relies on the quality of data used and the company's ability to maintain its validity and accuracy. Overall, these results suggest that the successful integration of AI into IBPs is not solely dependent on the technology itself but also on organizational readiness, ranging from technological infrastructure to human resource preparedness and managerial support.

#### **Ethical Considerations and AI-Decision Making**

The ethical aspects of AI implementation were a major concern in this study. PS1 highlighted concerns about the ethical implications of AI in decision-making, particularly regarding the transparency and accountability of AI algorithms. PS1 emphasized that to ensure fair and unbiased outcomes, the development of strict ethical guidelines for AI use within the company is necessary. This reflects the importance of transparency in AI operations, where every decision made by AI must be explainable and accountable.

PS2 added that while AI can enhance efficiency, it is crucial to consider the ethical risks that may arise, particularly concerning data privacy and security. PS2 suggested that companies implement robust ethical frameworks to guide the development and deployment of AI. This is essential given the increasing frequency of cyberattacks that could threaten the integrity and security of the data used by AI.

PS3 also underscored the importance of responsible AI use, emphasizing the need for clear guidelines and policies to ensure that AI technologies are employed ethically and responsibly. They also stressed the importance of educating employees about the ethical implications of AI, indicating that the understanding of AI ethics should not be confined to the managerial level but should be disseminated throughout the organization.

From Table 3, it can be seen that for PS1, the level of AI usage is estimated to be high (70%) because AI is used for software development and fraud detection, which are common applications in the software industry. For PS2, the level of AI usage is estimated to be quite high (60%) because AI is used for AI infrastructure and hardware sales, which are important in the financial sector. Meanwhile, for PS3, the level of AI usage is estimated to be moderate (50%) because AI is used for application development and online marketing. On the other hand, PS5 has an estimated AI usage level of medium (55%) because AI is used for risk detection and quality management, which are relevant in software development projects. Unlike PS1, PS2, PS3, and PS5, the survey results for PS4 show the lowest estimated AI usage at 40%, as the owner of an MSME, AI is likely used on a smaller scale for software development and online marketing.

### Survey Results

The survey conducted as part of this research provided valuable insights into the current state of AI adoption across various industries, specifically within Internal Business Processes (IBPs). The survey included 18 participants from diverse sectors such as software development, financial services, IT consulting, and small and medium-sized enterprises (SMEs). The respondents represented a range of roles from operational managers to technical experts, providing a broad perspective on how AI is being utilized within their organizations.

The results revealed a spectrum of AI usage, with notable differences based on industry and company size. For instance, PS1, representing the software sector, reported the highest level of AI adoption at 70%. This is largely due to the sector's reliance on advanced technologies for software development and fraud detection, where AI plays a critical role in enhancing operational efficiency and reducing risks. The high adoption rate in this sector highlights the importance of AI in industries that are heavily dependent on data-driven processes and automation.

In contrast, PS4, which represented an SME, reported the lowest AI adoption level at 40%. This reflects the challenges that smaller enterprises face in adopting AI, such as limited financial resources, lack of technical expertise, and insufficient managerial support. The survey data suggests that while SMEs recognize the potential benefits of AI, their ability to implement and integrate these technologies into their business processes is significantly constrained

by these factors. AI applications in these smaller firms are typically limited to basic functions such as software development and online marketing, which do not fully capitalize on AI's broader capabilities.

Other participants, such as PS2 and PS3 from the financial and IT consulting sectors respectively, demonstrated moderate levels of AI adoption, with usage rates of 60% and 50%. In these industries, AI is employed for more specialized tasks such as predictive analytics, customer behavior analysis, and fraud detection. PS2 highlighted how AI has improved real-time fraud detection, a critical capability in the financial sector. However, both PS2 and PS3 also pointed out the challenges related to data integrity and security, emphasizing the need for robust systems to manage these risks.

Moreover, PS5, representing another player in the software industry, reported an AI adoption level of 55%. Their usage primarily revolves around risk detection and quality management, indicating that even within the same sector, AI adoption can vary depending on the specific focus and technological maturity of the organization.

The survey results underscore a significant gap between the potential of AI and its actual implementation within IBPs. While there is clear interest and initial adoption of AI across industries, the extent of its integration is influenced by factors such as industry type, organizational size, resource availability, and the level of technical expertise. The findings suggest that larger companies and those in data-intensive sectors are more likely to embrace AI, while smaller firms and those with limited resources face greater challenges in adopting and integrating AI technologies.

This variation in AI adoption levels across industries and company sizes reflects the broader challenges of integrating advanced technologies into business processes. Companies that have successfully adopted AI tend to have better-defined processes, greater access to resources, and more robust support structures in place, including continuous training for staff and a clear understanding of the ethical implications of AI use.

### Discussion

The discussion aims to answer the research problems, interpret the findings, integrate them into existing knowledge, and suggest new theories or modifications to existing methods.

The primary research problem was to determine the feasibility of AI-enabled process improvement systems in IBPs. The findings

suggest that while there is interest and initial adoption, many companies are still in the early stages of integrating AI into their internal processes. This is consistent with the high failure rates of AI projects reported in the literature [2], [3], [4]. The data indicate that AI's integration into IBPs is hindered by a lack of understanding and insufficient managerial support, which highlights the need for targeted education and strategic alignment.

The survey results indicate a significant gap between the perceived potential of AI and its actual implementation in IBPs. This gap can be attributed to several factors, including a lack of understanding of AI's capabilities, insufficient managerial support, and inadequate resources. The interviews revealed that while companies recognize the benefits of AI, they face practical challenges in its implementation. These challenges include resistance to change, the complexity of integrating AI with existing systems, and concerns about data privacy and security. The findings suggest that successful AI integration requires not only technical solutions but also organizational readiness and a supportive culture.

The findings of this study align with existing research that emphasizes the importance of AI in business process optimization [2], [3], [4]. However, this study adds to the existing body of knowledge by focusing specifically on IBPs, an underexplored area. The study's results underscore the need for comprehensive process modeling and the establishment of clear responsibilities within organizations. Moreover, the ethical considerations highlighted in this research are critical for gaining managerial and

staff buy-in. Addressing these considerations can enhance the trust and acceptance of AI technologies within organizations.

Based on the findings, it is suggested that companies adopt a more structured approach to AI integration in IBPs. This includes comprehensive process modeling, a clear definition of responsibilities, and continuous training for staff on AI technologies. Additionally, companies should establish ethical guidelines for AI use to ensure responsible decision-making. The study also proposes the development of a framework for AI adoption in IBPs that includes stages such as assessment, planning, implementation, and evaluation. This framework can help organizations systematically integrate AI into their processes and measure the impact of AI on their performance.

### CONCLUSION

This study explored the feasibility of AI-enabled process improvement systems to assist businesses in optimizing their Internal Business Processes (IBPs). The research employed a mixed-methods approach, combining quantitative surveys and qualitative interviews, to gain a comprehensive understanding of how AI can be applied to improve IBPs and the challenges associated with its implementation.

The quantitative survey results indicated that while there is considerable interest in AI, its integration into IBPs is still in the early stages for many companies. The survey highlighted a significant gap between the perceived potential of AI and its actual implementation. This gap can be attributed to several factors, including a lack of understanding of AI's capabilities, insufficient managerial support, and inadequate resources.

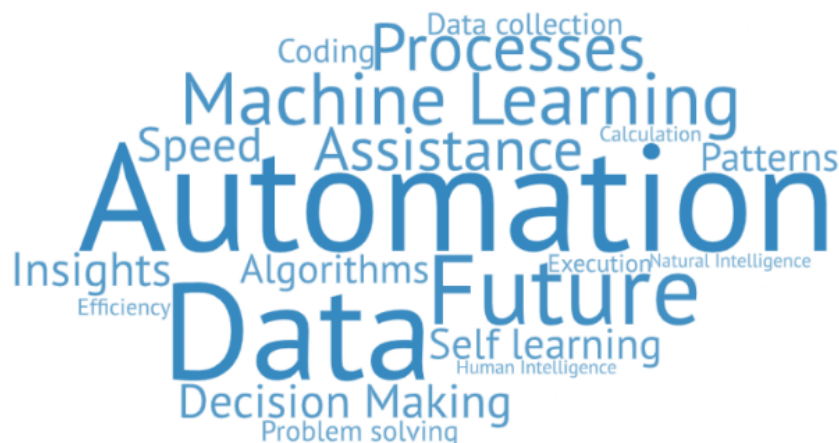


Figure 1. The results of the definition of AI in the form of a word cloud from survey participants

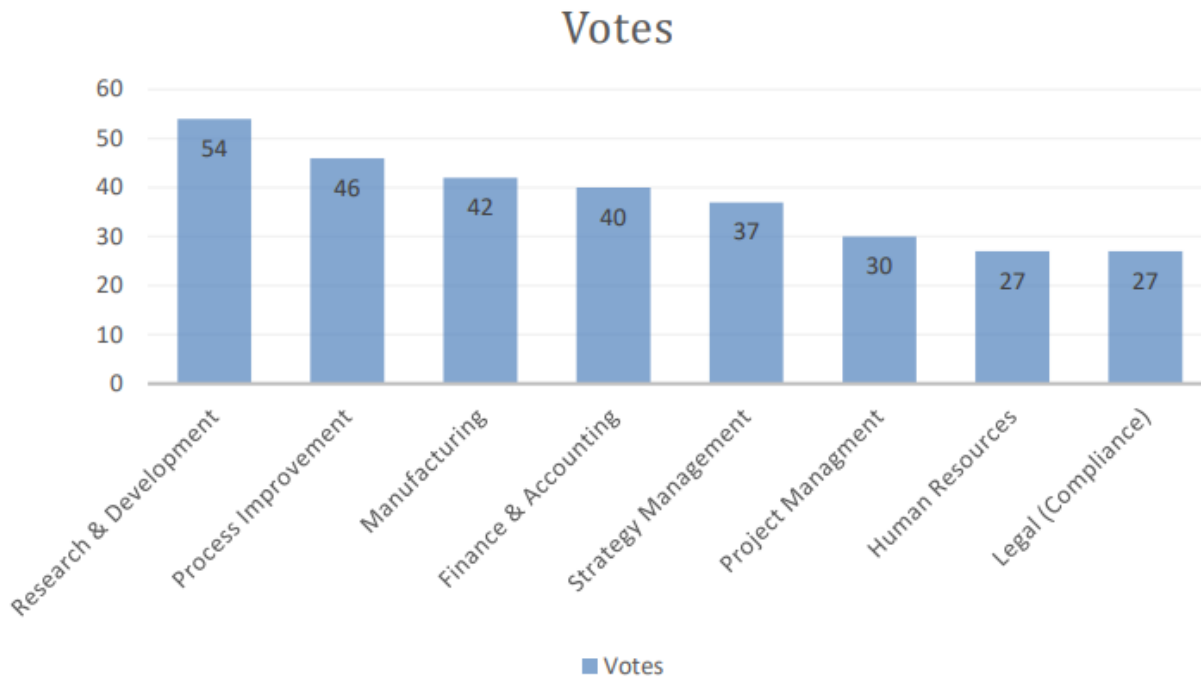


Figure 2. The level of AI usage according to the results of the participant survey in different industries

Table 3. Survey results on AI Adoption in IBPs

Participant Code	Occupation	Industry	AI Usage Level (%)	Common AI Application
PS1	Operational Manager	Software	70	Software development, fraud detection
PS2	Manager	Financial	60	AI infrastructure, hardware sales
PS3	Technical Manager	IT Consulting	50	Application development, online marketing
PS4	Owner	MSME	40	Software development, online marketing
PS5	Project Manager	Software	55	Risk detection, quality management

The qualitative interviews provided deeper insights into the practical challenges and benefits of AI integration. Participants from various industries shared their experiences with AI applications, revealing key themes such as digitization, process improvement, and ethical considerations. The interviews underscored the need for comprehensive process modeling, a clear definition of responsibilities, and continuous training for staff on AI technologies.

The findings of this study contribute to the existing body of knowledge by focusing specifically on IBPs, an area that has been underexplored in previous research. The study

emphasizes the importance of addressing ethical considerations in AI implementation, which is crucial for gaining managerial and staff buy-in. By investigating the current state of AI adoption in internal processes and identifying the factors that influence its success, this research provides valuable insights for companies looking to leverage AI for process improvement and ultimately enhance their business performance.

Future research should develop a framework for AI adoption in IBPs, including stages such as assessment, planning, implementation, and evaluation. This framework can help organizations systematically integrate AI

into their processes and measure the impact of AI on their performance. Additionally, further studies should explore the long-term effects of AI integration on employee satisfaction and productivity, as well as the ethical implications of AI in decision-making. By addressing these aspects, companies can ensure that AI technologies are used responsibly and effectively to drive business success.

#### ACKNOWLEDGMENT

We would like to express our heartfelt gratitude to our colleagues, Agus Wibowo. and Budi Raharjo, for their unwavering support and guidance throughout the research process. Their expertise, insights, and encouragement were invaluable in helping us to complete this work. We also want to thank our colleagues at STEKOM University Semarang Indonesia for their helpful feedback and support. Finally, we would like to thank our family and friends for their love and support throughout the research process. Without their encouragement and support, we would not have been able to complete this research.

#### REFERENCES

- [1] T. Ermakova, B. Julia, F. Benjamin, F. Elena, B. Marcus, and H. Manfred, "Beyond the Hype: Why Do Data-Driven Projects Fail," in Hawaii International Conference on System Science (HICSS), 2021. Accessed: Aug. 09, 2024. [Online]. Available: <https://scholarspace.manoa.hawaii.edu/>.
- [2] A. Popa, B. Amaba, and J. Daniels, "A Framework of Best Practices for Delivering Successful Artificial Intelligence Projects. A Case Study Demonstration," Proceedings - SPE Annual Technical Conference and Exhibition, vol. 2021-September, Sep. 2021, doi: 10.2118/206014-MS.
- [3] S. L. Wamba-Taguimdje, S. Fosso Wamba, J. R. Kala Kamdjoug, and C. E. Tchatchouang Wanko, "Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects," Business Process Management Journal, vol. 26, no. 7, pp. 1893–1924, Nov. 2020, doi: 10.1108/BPMJ-10-2019-0411.
- [4] C. Ledro, A. Nosella, and I. Dalla Pozza, "Integration of AI in CRM: Challenges and guidelines," Journal of Open Innovation: Technology, Market, and Complexity, vol. 9, no. 4, p. 100151, Dec. 2023, doi: 10.1016/J.JOITMC.2023.100151.
- [5] K. Jarek and M. Grzegorz, "Marketing and Artificial Intelligence," Central European Business Review, vol. 8, no. 2, pp. 46–55, 2019.
- [6] P. van Esch and J. Stewart Black, "Artificial Intelligence (AI): Revolutionizing Digital Marketing," Australasian Marketing Journal, vol. 29, no. 3, pp. 199–203, Aug. 2021, doi: 10.1177/18393349211037684.
- [7] M. H. Huang and R. T. Rust, "The Caring Machine: Feeling AI for Customer Care," J Mark, vol. 88, no. 5, Mar. 2024, doi: 10.1177/00222429231224748
- [8] C. Chizoba Ekechi, E. G. Chukwurah, L. Damilare Oyeniyi, C. David Okeke, B. Bank, and C. Author, "AI-INFUSED CHATBOTS FOR CUSTOMER SUPPORT: A CROSS-COUNTRY EVALUATION OF USER SATISFACTION IN THE USA AND THE UK," International Journal of Management & Entrepreneurship Research, vol. 6, no. 4, pp. 1259–1272, Apr. 2024, doi: 10.51594/IJMERE.V6I4.1057
- [9] M. P. Sikka, A. Sarkar, and S. Garg, "Artificial intelligence (AI) in textile industry operational modernization," Research Journal of Textile and Apparel, vol. 28, no. 1, pp. 67–83, Jan. 2024, doi: 10.1108/RJTA-04-2021-0046
- [10] G. Castañé et al., "The ASSISTANT project: AI for high-level decisions in manufacturing," Int J Prod Res, vol. 61, no. 7, pp. 2288–2306, Apr. 2023, doi: 10.1080/00207543.2022.2069525.
- [11] A. Ruvolo, "Business Intelligence: concepts and application - Implementation of an Intelligent Planning through software Board," Apr. 2024.
- [12] A. Cavallotto, "Business Intelligence and productivity, a study based on the analysis of a Business Case," Oct. 2023.
- [13] M. Dumas et al., "AI-augmented Business Process Management Systems: A Research Manifesto," ACM Trans Manag Inf Syst, vol. 14, no. 1, Jan. 2023, doi: 10.1145/3576047.
- [14] A. Yaseen, "REDUCING INDUSTRIAL RISK WITH AI AND AUTOMATION," International Journal of Intelligent Automation and Computing, vol. 4, no. 1, pp. 60–80, Mar. 2021, Accessed: Aug. 09, 2024. [Online]. Available: <https://research.tensorgate.org/index.php/IJIAC/article/view/96>.
- [15] Y. Al-Anquoudi, A. Al-Hamdani, M. Al-Badawi, and R. Hedjam, "Using Machine Learning in Business Process Re-Engineering," Big Data and Cognitive Computing 2021, Vol. 5, Page 61, vol. 5, no. 4, p. 61, Nov. 2021, doi: 10.3390/BDCC5040061.
- [16] A. Fetais, G. M. Abdella, K. N. Al-khalifa, and A. M. Hamouda, "Modeling the Relationship between Business Process Reengineering and Organizational Culture," Applied System



- Innovation 2022, Vol. 5, Page 66, vol. 5, no. 4, p. 66, Jul. 2022, doi: 10.3390/ASI5040066.
- [17] A. Fetais, G. M. Abdella, K. N. Al-khalifa, and A. M. Hamouda, "Modeling the Relationship between Business Process Reengineering and Organizational Culture," *Applied System Innovation 2022*, Vol. 5, Page 66, vol. 5, no. 4, p. 66, Jul. 2022, doi: 10.3390/ASI5040066.
- [18] R. Hicham, L. Abdellah, and M. Mohamed, "Emerging Science Journal Continuous Integration of Risk Management in a Business Process Reengineering: Towards Optimization through Machine Learning," *Emerging Science Journal*, vol. 8, no. 3, 2024, doi: 10.28991/ESJ-2024-08-03-019.
- [19] J. E. Sordan, P. C. Oprime, M. L. Pimenta, S. L. da Silva, and M. O. A. González, "Contact points between Lean Six Sigma and Industry 4.0: a systematic review and conceptual framework," *International Journal of Quality and Reliability Management*, vol. 39, no. 9, pp. 2155–2183, Oct. 2022, doi: 10.1108/IJQRM-12-2020-0396.
- [20] G. Citybabu and S. Yamini, "Lean Six Sigma 4.0 – a Framework and Review for Lean Six Sigma Practices in the Digital Era," *Benchmarking: An International Journal*, 2023, doi: 10.1108/BIJ-09-2022-0586.
- [21] K. McKellar, E. Sillence, N. Neave, and P. Briggs, "Digital Accumulation Behaviours and Information Management in the Workplace: Exploring the Tensions Between Digital Data Hoarding, Organisational Culture and Policy," *Behaviour & Information Technology*, vol. 43, no. 6, pp. 1206–1218, Apr. 2024, doi: 10.1080/0144929X.2023.2205970.
- [22] M. Lubis, M. F. Safitra, H. Fakhurroja, and D. P. Putri, "Navigating Online Privacy: Insights from Cybersecurity Expert," *Procedia Comput Sci*, vol. 234, pp. 1388–1395, Jan. 2024, doi: 10.1016/J.PROCS.2024.03.137.
- [23] J. L. Spears and H. Barki, "User Participation in Information Systems Security Risk Management," *MIS Q*, vol. 34, no. 3, pp. 503–522, 2010, doi: 10.2307/25750689.
- [24] A. Moser and I. Korstjens, "Series: Practical Guidance to Qualitative Research. Part 3: Sampling, Data Collection and Analysis," *European Journal of General Practice*, vol. 24, no. 1, pp. 9–18, Jan. 2018, doi: 10.1080/13814788.2017.1375091.