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THE ROLE OF AI IN BUSINESS MANAGEMENT: BALANCING PRIVATE AND OPEN-SOURCE AI

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ABSTRACT

Purpose: *Create a framework supporting managers in integrating AI into business management decisions.*

Need for the study: *The Artificial Intelligence (AI) discipline is revolutionizing business management via enhanced decision-making procedures, enhanced operational effectiveness, and improved strategic planning. Looking at the openness of their algorithms and data training and handling, AI models are generally categorised into Private and Open-Source models. The aforementioned distinctions significantly affect the functioning of companies in terms of privacy, data security, and competitive standing. Businesses must make a fundamental trade-off between Open-Source AI, that could be limited in data privacy and security, but it presents a lower initial investment, and Private AI, which provides better data control at the expense of increased financial investment.*

Methodology: *Critical analysis of the literature, case studies and practitioner experience.*

Findings: *The research presents limits and opportunities of both Open-Source and private AI, and a framework to support managers in integrating both models in different areas of their operations to optimize benefits.*

Practical Implications: *A structured approach can help managers make informed decisions about adopting AI, balancing cost, security, and scalability*

Keywords: artificial intelligence, open-source AI, private AI, hybrid AI, business management, models

Jel codes: M15; O32; O33

1. INTRODUCTION

Artificial intelligence plays a key role in the modern world, revolutionizing technological, economic and social changes. In business operations, it has established new paradigms in business automation, decision-making, and data-driven analytics (Beverungen, Hess, Köster & Lehrer, 2022; Babina, Fedyk, He & Hodson, 2024). In business management, it has enabled innovation, increased productivity, and improved the accuracy of strategic decisions (Abou-Foul, Ruiz-Alba & Lopez-Tenorio, 2023; Broekhuizen et al., 2023). This is emphasized by business leaders, who almost unanimously (98%) see

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AI as a priority for their organizations (IDC, 2024). In 2025, Megacap technology companies intend to allocate $ 320 billion in the development of artificial intelligence (Subin, 2025). Research conducted by IDC (2024) indicates that enterprise spending on AI will have a cumulative global economic impact of $19.9 trillion by 2030 and will drive 3.5% of global GDP in 2030. It means that AI will impact jobs in every region of the world, in every industry, like contact center operations, translation, accounting, and machinery inspection.

Companies are integrating AI into business management decisions to make them more effective, lower the cost of conducting business, and improve their capacity to interpret large sets of data (Kumar, Ashraf & Nadeem, 2024). This is fueled by technological advancement, improved computing capacity, and the necessity for organizations to adapt to an ever-accelerating digital environment (Mukhopadhyay, Singh & Jain, 2024). Artificial intelligence is being embraced in many fields, such as finance, health, retail, and supply chain management, a clear indication of its versatility and essentiality in contemporary business environments (Pallathadka et al., 2023).

The discourse of artificial intelligence within the business management context is typically based on two broad frameworks: Private AI and Open-Source AI (Tursunbayeva & Gal, 2024). Open-Source AI systems, engineered through the concerted efforts of international communities, provide companies economically viable and scalable solutions (Wang, Li, Du & Wang 2024). Security, compliance, and data privacy concerns are some of the inherent problems with the implementation of Open-Source AI solutions (Bickley, Macintyre & Torgler, 2024). In contrast, even with some limits in algorithm training, Private AI delivers customized, secure, and proprietary artificial intelligence solutions for enterprises that value data privacy and competitive edge (Van Bekkum & Borgesius, 2023). Considerations regarding Open-Source and Private AI emphasize the great importance of developing a framework to support managers in implementing various AI models. In addition, the use of artificial intelligence in business management creates opportunities and challenges that require strategic alignment with organizational goals (Blut, Wünderlich & Brock, 2024). Organizations that can effectively use AI can leverage its potential in predictive analytics, automation, and adaptive learning, thereby improving decision-making and overall performance (Jada & Mayayise, 2023). Moreover, they must consider the cost implications, ethical aspects, and compliance with regulatory requirements of implementing AI (Cristianini, 2024). Some authors (Tursunbayeva & Gal, 2024; Mukhopadhyay et al., 2024; Wang et al., 2024) point to the possibilities of combining Open-Source AI and Private AI to eliminate obstacles and use the advantages of both models. However, none of them indicates what such a hybrid structure would look like, in what areas of operation and why should enterprises use Open-Source AI and in which Private AI, what can be identified as an existing research gap.

This chapter aims to address this gap by explaining the key distinctions between Open-Source AI and Private AI and possibilities of their implementation in various areas of activity. Drawing upon real-case studies and industry observations, this chapter offers an integrated understanding of the evolutionary nature of AI in business management. Chapter will answer two research questions:

1.How business functions could be supported by Open-Source AI or Private AI?

2.Why should companies incorporate Open-Source AI or Private AI in their business functions?

Based on the obtained results, conclusions will be drawn regarding the shaping of the use of individual AI models in the activities of enterprises. Chapter was created based on the analysis of the literature on the subject and the analysis of case studies of companies using artificial intelligence solutions.

2. LITERATURE REVIEW

The scientific justification for adopting AI in business management focuses on how AI-based technology stimulates productivity, optimizes resources, and delivers value to business organizations (Mukhopadhyay et al., 2024). Databases such as Scopus and Web of Science contain hundreds of thousands of articles that address various aspects of AI. The number of publications is growing year by year, covering more and more issues. Research on AI in business management has appeared in almost 6.5 thousand publications over the last 10 years (as presented in Figure 1). In the period January - February 2025, 234 items have already been published, which allows to conclude that the number of studies on this topic will increase.

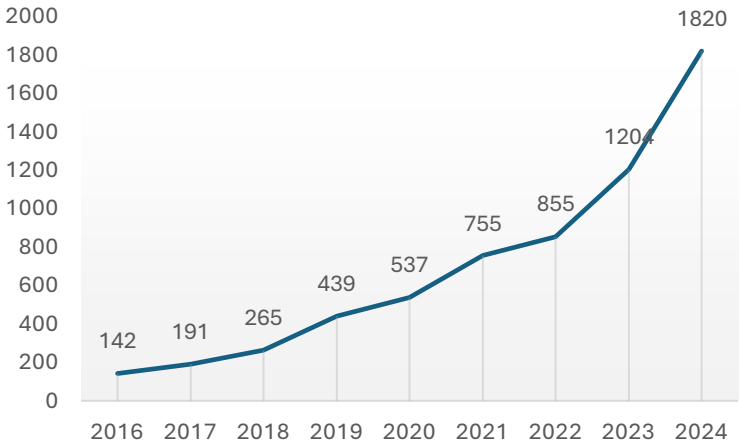

Figure 1. Number of publications on AI in business management, broken down by year
Source: own study based on Scopus, Web of Science.

The bibliometric analysis of the articles made it possible to distinguish six thematic clusters (presented in Fig. 2):
Cluster 1. main keyword categories: information management, blockchain, internet of thing, big data, network security, digital storage, communication system, network security. Looking at the references, the publications concern digital technologies.
Cluster 2. main keyword categories: human, healthcare, economics, quality control, covid-19, pandemic, ai, robotics. Looking at the references, the publications concern health and society.
Cluster 3. main keyword categories: business process, knowledge management, enterprise resource management, business process management, information systems. Looking at the references, the publications concern business management.
Cluster 4. main keyword categories: artificial intelligence, innovation, management, competition, competitive advantage, sustainable development. Looking at the references, the publications concern innovation and development.
Cluster 5. main keyword categories: decision making, learning system, forecasting, analysis, deep learning, risk analysis, business decisions. Looking at the references, the publications concern analysis and decision-making.
Cluster 6. main keyword categories: sales, human resource management, resource allocation, human resource management, marketing, customer experience, customer service. Looking at the references, the publications concern resources and marketing.

Narrowing the literature analysis to Open-Source or Private AI in business management enabled the identification of 307 items, the number of which was reduced to 59 after the analysis of titles and abstracts. The remaining items described the key concepts of Open-Source and Private artificial intelligence models along with an indication of the possibilities of their application in practical examples. Some of them described the development and use of AI in specific regions or countries (Concepcion, et. al., 2019; Ibeneme, et. al., 2021; Camarena, 2022; Turlacu, Chivu, Stoica, Orzan & Herrezeel, 2018; Iwamoto, 2019; Mikalef, Fjørtoft & Torvatn, 2019; Gaur, Maurya & Choubey, 2024; Singh, Sao, Singh & Hinchey, 2023; Abdeldayem, AlDeeb, Sharif & Aldulaimi, 2024), while others focused on industries such as banking (Gustev, 2020; Kadhim & Al Ani, 2023; Singh, et. al., 2023; Nayak, Singh, Baral, Goel & Hota, 2023), construction (Altaie & Dishar, 2024; Marsden, 2019), or healthcare (Kocakoç, 2022; Perdanakusuma, Puspitasari & Saputra, 2020; Cunha, Duarte, Lopes, Guimarães & Santos, 2024).

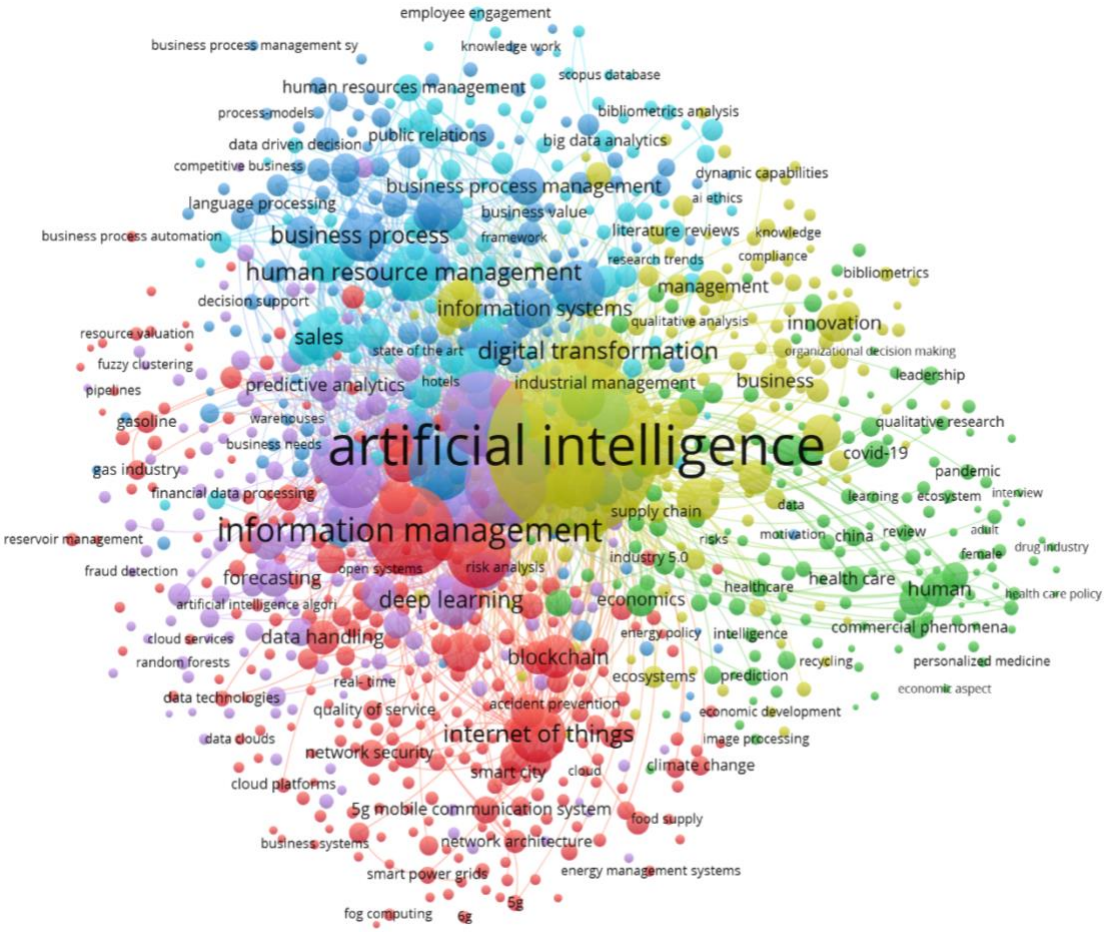

Figure 2. Co-occurance analysis of the keywords in literature
Source: own study based on Scopus, Web of Science.

Most of the analyzed items, however, referred to a specific area of the company's operation in which a specific artificial intelligence solution can be applied. A detailed analysis allowed to distinguish the following functions: accountability (Roberts & Tonna, 2022; Bhavani, 2020), finance (Sanz & Zhu, 2021), marketing (Mittal, Chandel & Nguyen, 2025; Singh & Adhikari, 2023), production management (Khan, Malik & Khan, 2022; Marsden, 2019; Abdeldayem, et. al., 2024), human resources (Gildhiyal & Prasad, 2023; Goel, Sahai, Venaik & Benfadel, 2021; Gomathi, Sabale & Chilamkurti, 2019), research and development (Cooper, 2024; Cooper, 2025), top management decisions (Alshadoodee, Mansoor, Kuba & Gheni, 2022; Joudat & Lighvan, 2021; Rajabion, 2018; Figueiredo, 2024; Altaie & Dishar, 2024; Sträßer & Stolicna, 2023) and procurement (Beheshti, et. al. 2021; Rajakumari, Hamsagsayathri & Shanmugapriya, 2023; Perdanakusuma, et. al., 2020). Among the analyzed items were also those that describe AI models more comprehensively, considering various solutions and possibilities of their implementation (Lang, 2021; Jermsittiparsert, Phongkraphan & Lekhawichit, 2024; Kose & Demirezen, 2024; Khang, Abdullayev, Jadhav, Gupta & Morris, 2023; Singh, Khan, Kumar & Kumar, 2024).

As AI technology advances, more and more organizations are exploring hybrid AI models that leverage the functionalities of both Open-Source and Private AI (Tursunbayeva & Gal, 2024; Pallathadka et al., 2023). The goal of combining AI models is to integrate the scalability and economic benefits of Open-Source AI while providing the security and customized solutions provided by Private AI (Babina et al., 2024). Theoretical insights into integrating both models suggest that organizations can benefit from the strengths inherent in the two by formulating strategic AI adoption plans (Cristianini, 2024).

3. OPEN-SOURCE AI IN BUSINESS MANAGEMENT

Open-source AI is a form accessible to all individuals, although it encompasses a range of approaches – from fully open models with unrestricted access to their code and weights, to partially open models which share certain components and impose restrictions through licenses (Vake, Šinik, Vičič & Tošić, 2025). Open-Source Initiative (OSI), widely regarded as the authority on open-source principles, has introduced a standardized definition aimed at guiding policymakers in regulating AI for consumer protection. According to this new definition, an AI system must be freely usable for any purpose without requiring prior authorization, allow researchers to examine its components, and provide insights into its operational mechanisms. Additionally, it must be modifiable for various applications and shareable, with or without alterations. The framework also sets a transparency benchmark, requiring open disclosure of key elements such as training data, source code, and model weights to ensure accountability in AI development (MIT Technology Review, 2024).

Open-Source AI plays a key role in the digital economy, as evidenced by the fact that over 60% of global websites use open-source servers such as Apache and Nginx (Lifshitz-Assaf & Nagle, 2021). Furthermore, a 2021 EU report emphasizes that the economic benefits of open source far outweigh its costs (Blind, et al., 2021). Open-Source AI platforms are used by many organizations to enable collaborative innovation, speed up software development, and include AI functionality without having to invest large amounts of capital (Broekhuizen, et al., 2023). The most frequently cited benefits of open source include enabling external oversight, accelerating progress, and decentralizing control over potentially transformative technology. As a result, it has a positive impact on most software and AI development processes, determining the direction of technological innovation and facilitating the development of products that are well-adapted to the various needs of users (Seger, et. al., 2023).

Unfortunately, as AI research has progressed, Open-Source has created opportunities for misuse. Their reliance on public datasets and shared learning models puts it at risk of security vulnerabilities, intellectual property infringement, and compliance hazards (Afroogh, Akbari, Malone, Kargar & Alambeigi, 2024). Open-Source increases the risk of model flaws spreading, model modification, and cyberattacks (Seger, et. al., 2023).

Conceptual models for Open-Source AI emphasize the balance between openness and governance with an emphasis on the need for firms to develop robust frameworks for AI implementation (Bickley, et al., 2024). Supporting openness promotes innovation and opportunities for collaboration, but effective governance mechanisms must also be in place to ensure responsible and safe AI development.

4. PRIVATE AI IN BUSINESS MANAGEMENT

Private AI platforms offer organizations customized solutions that provide them with a high degree of control over their data, thereby ensuring security and compliance with regulatory requirements such as GDPR and HIPAA (Van Bekkum & Borgesius, 2023; Rajaguru, 2024). Having this control enables organizations to customize AI applications to fit their particular operational requirements, which results in improved accuracy of analytics and decision-making (Abou-Foul, et al., 2023). Due to rigorous compliance procedures and better data protection mechanisms, it is a preferred solution for organizations operating in fields such as finance, healthcare, and legal services (Blut, et al., 2024).

Institutions tasked with the governance of sensitive data, for example, healthcare organizations and financial institutions, are greatly advantaged by Private AI owing to the possibility of reduced breaches of data and information (Khowaja, Dev, Qureshi, Khuwaja & Foschini, 2022). Private AI also supports governance and administration, enabling companies to fully utilize in-house operations without making any concessions on openness and accountability for AI-driven processes (Afroogh, et al., 2024). One of the most significant benefits of Private AI is that it can provide customized solutions to fit individual business models (Cubric & Li, 2024). In contrast to Open-Source AI, which relies on generalized algorithms developed from openly available datasets, Private AI systems are developed using proprietary datasets and domain-specific algorithms (Tursunbayeva & Gal, 2024).

This personalized strategy provides increased accuracy in intelligence, improves operational efficiency, and allows organizations to stay ahead of their rivals (Broekhuizen, et al., 2023). Private artificial intelligence also assists in strategic decision-making by supporting extensive data analysis, predictive models, and business intelligence activities in accordance with the organization's goals and

position in the market (Babina, et al., 2024). Yet, the use of these technologies is hindered by considerable barriers. The expense associated with developing and sustaining proprietary AI technologies tends to be exorbitantly expensive, involving heavy investment in infrastructure, specialist personnel, and constant maintenance (Trabelsi, 2024). Most small and medium-sized enterprises (SMEs) lack the capacity to devote adequate resources towards Private AI adoption, and hence Open-Source AI or Hybrid AI presents a more realistic alternative (Beverungen, et al., 2022).

In addition, complexity in the management of Private AI systems demands state-of-the-art technical know-how, which may be beyond the means of most companies, thus leading to overdependence on third-party vendors for AI development and maintenance (Jorzik, Klein, Kanbach & Kraus, 2024). One of the traditional case studies of Private AI utilization is in banking, where AI is utilized by banks for fraud detection as well as risk assessment (Rajaguru, 2024). Banks utilize Private AI to examine transaction data, identify anomalies, and block fraudulent transactions in real time while adhering to stringent financial rules (Pallathadka, et al., 2023).

Through the utilization of artificial intelligence-powered security controls, financial institutions are able to safely prevent fraud without undermining data integrity and regulatory compliance (Kumar, et al., 2024). While Private AI is costly, companies operating in highly regulated sectors usually find that the benefits of enhanced security and compliance justify the expenses incurred (Van Bekkum & Borgesius, 2023).

Theoretical discourse on Private AI highlights the necessity to safeguard confidential business information, reduce cybersecurity threats, and maintain adherence to data protection laws (Wang, et al., 2024). However, the resource-demanding and expensive nature of Private AI presents significant challenges for small and medium enterprises (SMEs) in their pursuit of AI-driven solutions (Pallathadka, et al., 2023).

5. OPEN-SOURCE AND PRIVATE AI APPLICATION IN BUSINESS MANAGEMENT

According to the literature analysis presented above and considering the numerous AI tools that can be integrated into business functions, one might imagine that most business activities could be supported in some way by AI systems. Theoretically, everything is possible, but in practice, it can be very complex to understand ‘how’ to integrate these systems and ‘why’. On the basis of such decisions, it is necessary to know the AS-IS of the companies and the skills of the people who work in the company very well in order to understand, on the one hand, the right time to integrate the systems and, on the other, how to train human resources and how to stimulate in them the need to change their work patterns in order to dedicate more time to activities with higher added value.

The first problem to be solved in the application of artificial intelligence in companies is to understand to what level to automate the processes or how to support them through standard or custom AI tools. The first step is to analyze the company organization, its functions and the criticality of the processes. For this reason, the following table can be helpful in understanding how to integrate AI services into business activities according to a logic based on the division of the complexity of the organization into business functions and, further, the complexity of the business functions into processes. The table proposes the ‘how’ and the ‘why’ business activities could be supported by AI systems to increase efficiency or, in some cases, to save time to dedicate to higher-value activities. These considerations can be used when managers will have to further divide the activities of the business functions into processes and, therefore, will have to understand which AI agents to activate for each process and what level of autonomy these AI agents will have to have. Above all, they will have to decide whether the AI agents will have to be supported by Open-source AI or Private AI systems.

Table 1. AI Applications Across Business Functions.

Function	Subcategories	WHY Private AI?	HOW to Use Private AI?	WHY Open-Source AI?	HOW to Use Open-Source AI?	Literature
Accountability	**Risk Management** – This involves the systematic identification, assessment, and prioritization of potential risks—be they financial, operational, or strategic. AI contributes by analyzing vast datasets to predict and mitigate these risks, thereby safeguarding organizational assets and ensuring business continuity	Ensures that sensitive risk-related data is processed securely, maintaining confidentiality and compliance with regulatory standards	Dealing with proprietary risk models or handling data that is subject to strict regulatory oversight	Offers cost-effective tools for general risk assessment, making it accessible for organizations with limited resources	Conducting preliminary risk evaluations that do not involve sensitive or confidential information	Butler & O'Brien (2019), Bhavani (2020), Roberts & Tonna (2022), Addy, et. al. (2024), Dopamu, Adesiyan & Oke, (2024), Dopamu, Adesiyan & Oke, (2024), Laraki, Schaus & Deville (2024), Yafooz & Al-Gumaei (2025)
	Compliance – Ensuring that an organization adheres to relevant laws, regulations, and internal policies. AI automates the monitoring and reporting processes, reducing manual efforts and minimizing the risk of non-compliance	Provides a secure environment for handling regulatory data, ensuring adherence to industry and governmental compliance standards without external exposure	Operating in highly regulated industries such as finance, healthcare, or legal sectors that require stringent compliance measures	Provides readily available compliance monitoring tools that are cost-effective and easy to integrate into existing workflows	Incompliance requirements are standard and do not require high levels of confidentiality	
	Auditing – The systematic examination of financial records and operations to ensure accuracy and integrity. AI enhances auditing by quickly analyzing large volumes of data to detect anomalies and potential fraud	Safeguards financial records and internal auditing processes, minimizing the risk of breaches and unauthorized access	Conducting internal audits for financial integrity and regulatory adherence within large enterprises	Offers scalable auditing tools that can analyze financial data at a lower cost, making it useful for smaller organizations	Organizations require basic auditing solutions without the need for confidential data protection	
Finance	**Fraud Detection** – Identifying and preventing fraudulent activities by analyzing	Provides customized fraud detection systems	Dealing with high-value transactions and critical	Provides accessible fraud detection solutions suitable	Monitoring standard transactions in	Sanz & Zhu, (2021), Jain & Kulkarni (2023),

	transaction patterns and detecting anomalies. AI systems can process vast amounts of data in real-time to flag suspicious behavior	tailored to an organization's specific risks, protecting sensitive financial transactions	financial operations where security breaches can cause severe financial damage	for general financial monitoring	organizations with lower exposure to fraud risks	Yang, et.al. (2024), Kokare, et. al. (2024), Alsaadi et. al. (2024), Chaiwong & Srisai (2024), Lee, Hayes & Maher, (2024)
	Financial Forecasting – Predicting future financial performance based on historical data and market trends. AI enhances accuracy by identifying patterns and correlations that may not be evident through traditional analysis	Customizes financial models based on proprietary data, ensuring accurate and strategic financial forecasting	Financial forecasting needs to be highly specific, confidential, and tailored to a company's market positioning	Offers generic forecasting tools that analyze industry-wide trends	Performing general financial projections that do not require proprietary data	
	Budgeting – Allocating financial resources to various departments and projects. AI automates data collection and analysis, facilitating more accurate and efficient budgeting processes	Ensures confidentiality in financial planning and allows precise budget allocation aligned with company objectives	Budget planning involves sensitive financial strategies and long-term business investments	Provides cost-effective budgeting tools for general financial management	Handling basic budgeting tasks that do not require data security	
Marketing	**Social Media Analytics** – Analyzing social media platforms to understand customer sentiments, engagement, and brand perception. AI processes unstructured data from various platforms to provide actionable insights	Enables organizations to develop advanced, proprietary consumer insights while maintaining control over user data	Targeting niche audiences or creating highly personalized marketing campaigns that require exclusive data	Offers accessible analytics tools for broad social media trend analysis	Analyzing general audience behavior and engagement trends without sensitive data usage	Nikita & Velicheti, (2022), Sharma, Patel & Gupta (2022), Singh & Adhikari (2023), Okeleke, Ajiga, Folorunsho & Ezeigweneme (2024), Fu, Foell, Xu & Hiniker (2024), Hemalatha, Amulya & Lalitha (2024),
	Internal & External Communication – Managing and optimizing communication within the organization and with external stakeholders. AI-powered tools facilitate	Secures internal communications and ensures data privacy within confidential	Managing internal corporate messaging that involves sensitive business information	Provides cost-effective solutions for general customer and public communication	Automating basic customer service responses or general inquiries	

	efficient information dissemination and engagement	company interactions				Mittal, et. al. (2025), Yafooz & Al-Gumaei (2025), AlAfnan (2025)
	Customer Segmentation – AI categorizes customers based on behaviors to improve targeting and personalization	Offers highly accurate and proprietary segmentation models tailored to an organization's specific consumer base	Customer segmentation requires high accuracy and secure customer profiling for strategic targeting	Provides basic segmentation models that are easy to implement	Performing broad customer segmentation that does not require sensitive data	
Production Management	**Supply Chain Optimization** – This involves enhancing the efficiency and effectiveness of the entire supply chain, from raw material procurement to product delivery. AI facilitates real-time tracking, predictive analytics, and automation, leading to reduced costs and improved responsiveness to market demands	Ensures optimal efficiency in production and quality control	Managing proprietary manufacturing processes	Offers low-cost forecasting capabilities	Insights are needed for general production trends	Marsden (2019), Zhang, Muskat & Law (2021), Khan, et. al., (2022), Aminabadi, et. al. (2022), Widder & Nafus (2023), Ma & Wang (2024), Abdeldayem, et. al. (2024), Kagalwala, Radhakrishnan, Mohammed, Kothinti & Kulkarni(2025)
	Quality Control – Ensuring that products meet predefined quality standards through systematic inspection and testing. AI enhances this process by automating inspections, detecting defects, and predicting potential quality issues	Integrates with proprietary production processes, ensuring precise quality control while maintaining trade secrets	Quality control involves sensitive manufacturing processes that differentiate the company from competitors	Offers accessible defect detection models suitable for general production monitoring	Overseeing standard production quality control that does not involve confidential methodologies	
	Demand Forecasting – Predicting future customer demand to optimize inventory and production planning. AI analyzes historical sales data, market trends, and external	Allows organizations to generate highly accurate demand forecasts tailored to their own historical	Demand forecasting is crucial to inventory management and requires proprietary consumer insights	Provides industry-wide demand forecasting tools that analyze macroeconomic trends	Conducting broad market trend analysis that does not require proprietary data	

	factors to provide accurate forecasts	data and market conditions				
Human Resources (HR)	**Talent Acquisition** – The process of identifying, attracting, and hiring skilled individuals to meet organizational needs. AI streamlines this by automating resume screening, matching candidates to roles, and predicting candidate success	Ensures that recruitment data and hiring processes remain confidential while using proprietary candidate assessment models	Managing executive-level hiring or positions that require high-security clearance	Provides cost-effective solutions for automated resume screening and initial candidate filtering	Recruiting for general roles that do not require high levels of confidentiality	Mahatme & Bhoyar (2016), Goel, et. al. (2021), Alsaif & Sabih Aksoy (2023), Thakur, Hinge &Adhegaonkar (2023), Gryncewicz, Zygała & Pilch (2023), Gildhiyal & Prasad (2023), Gomathi, et. al. (2023), Saouabe, Oualla, Mazar & Messadia (2024), Faheem, et. al. (2024), Don-Yehiya, et. al. (2024), Radonjić, Duarte & Pereira (2024)
	Employee Engagement – Fostering a work environment where employees are committed, motivated, and productive. AI assesses engagement levels through sentiment analysis, surveys, and performance metrics	Enables secure analysis of employee feedback, ensuring confidentiality and customized engagement strategies	Managing workforce morale in large enterprises with sensitive internal dynamics	Provides basic tools for assessing employee satisfaction through surveys and analytics	Conducting general employee sentiment analysis without data privacy concerns	
	Workforce Planning – Strategically aligning workforce capabilities with organizational objectives. AI aids by predicting future workforce needs, identifying skill gaps, and optimizing staffing levels	Allows for customized workforce models tailored to company-specific operational needs	Planning for long-term workforce strategy and talent retention	Offers accessible workforce planning tools based on industry-wide trends	Analyzing broad employment trends and general workforce optimization	
Research & Development (R&D)	**AI-driven Innovation** – Leveraging AI to create new products, services, or processes. This includes using machine learning to identify market opportunities and develop innovative solutions	Allows organizations to maintain exclusivity over innovation pipelines and intellectual property	Developing proprietary technologies or disruptive innovations in competitive industries	Provides accessible tools for research collaborations and idea generation	Engaging in open innovation and crowdsourced R&D initiatives	Rane, Choudhary & Rane (2023), Cooper (2024), Govindarajan (2024), Alabi (2024), Cooper (2025), Marion, Yuan &
	Product Development – The process of bringing a new product to market, from	Ensures control over proprietary design data and	Working on high-value product developments	Offers accessible design tools for rapid prototyping	Experimenting with general product iterations	

	ideation to launch. AI assists by optimizing design, predicting market acceptance, and streamlining development processes	customized product optimization	requiring confidentiality	and standard product enhancements	in non-sensitive markets	Moghaddam (2025)
	Competitive Analysis – AI assesses market competitors and industry trends	Provides tailored market intelligence while keeping competitor insights confidential	Strategic market positioning and trade secrets must be protected	Offers general industry trend reports that help businesses stay competitive	Performing broad market research that does not involve confidential business intelligence	
Sales	**Customer Relationship Management (CRM)** – Managing interactions with current and potential customers to improve relationships and drive sales growth. AI automates data entry, analyzes customer behavior, and personalizes communication strategies	Enables secure storage and processing of customer data to maintain exclusive business insights	Handling sensitive customer data that requires compliance with privacy regulations	Provides standard CRM solutions for general customer interactions and engagement tracking	Managing non-sensitive client relationships and lead tracking	Nalini, Radhakrishnan, Yogi, Santhiya & Harivardhini (2021), Singh, et. al. (2023), Ledro, Nosella & Dalla Pozza (2023), Iyelolu, et. al. (2024), Gupta & Agarwal (2024), Ozay, Jahanbakht, Shoomal & Wang (2024), Pattanayak (2021), Raji et. al. (2024), Badmus, Rajput, Arogundade & Williams (2024), Alabi (2024),
	Lead Scoring – AI ranks potential customers based on engagement likelihood	Refines lead-scoring models using internal, proprietary customer engagement data	Optimizing sales pipelines for high-value and strategic customers	Offers scalable lead-scoring algorithms that analyze broad market behavior	Targeting general customer acquisition efforts in non-specialized industries	
	Sales Forecasting – This process involves predicting future sales volumes based on historical data, market trends, and economic indicators. AI enhances accuracy by analyzing vast datasets and identifying patterns that may not be evident through traditional methods	Ensures high accuracy in forecasting using internal financial and operational data	Precise revenue predictions are required for investment and strategic growth	Provides cost-effective sales forecasting tools based on public market data	Conducting broad industry sales projections without proprietary financial insights	

						Acharjee, et. al. (2024)
Logistics	**Inventory Management** – Overseeing the ordering, storage, and use of a company's inventory. AI optimizes stock levels, predicts demand fluctuations, and reduces holding costs	Provides optimized inventory control tailored to specific supply chain needs	Managing large-scale, high-value inventory with complex supply chains	Offers general inventory management tools for small to mid-sized businesses	Handling standard stock management without intricate logistical constraints	Borisova, Taymashanov & Tasueva (2019), Choudhuri (2022), Boute & Udenio (2022), Ping, Zhu, Ling & Niu (2024), Villegas-Ch, Navarro & Sanchez-Viteri(2024), Manaviriyaphap (2024)
	Transportation Optimization – Enhancing the efficiency of transporting goods by selecting optimal routes, modes, and schedules. AI analyzes traffic patterns, fuel costs, and delivery windows to minimize expenses and improve service levels	Ensures proprietary logistics strategies remain confidential and efficient	Dealing with large-scale transportation networks requiring customized optimization	Provides accessible route optimization tools for cost-effective shipping	Improving standard transportation routes without requiring specialized logistics strategies	
	Warehouse Management – AI automates inventory levels and storage logistics	Enables precise warehouse tracking while protecting operational processes	Handling high-value, complex warehousing systems requiring secure management	Provides standard warehouse automation tools for general inventory tracking	Managing straightforward warehouse operations with standard storage needs	
Procurement	**Supplier Selection** – Identifying and choosing suppliers based on criteria such as cost, quality, reliability, and service. AI evaluates supplier performance data and market conditions to inform decisions	Enables advanced supplier evaluation models while ensuring confidentiality	Negotiating high-value contracts with strategic vendors	Provides general supplier assessment tools for broad procurement decisions	Selecting vendors based on publicly available performance metrics	Beheshti, et. al. (2021), Kumar & Kumar, (2023), Rajakumari, et. al. (2023), Yan, et. al. (2024)
	Spend Analysis – Examining procurement data to identify spending patterns and opportunities for cost reduction. AI automates data aggregation	Ensures confidential financial analysis while optimizing procurement budgets	Optimizing procurement costs within large organizations requiring sensitive data protection	Provides general cost-analysis tools for standard expense tracking	Analyzing general spending trends in non-sensitive procurement activities	

	and identifies anomalies or inefficiencies.					
	Contract Analysis – AI reviews legal agreements to highlight key terms and risks	Securely processes and interprets contractual agreements for legal compliance	Handling complex, high-value contracts requiring detailed legal oversight	Provides automated contract review tools for standard agreement analysis	Reviewing basic contracts where confidentiality is not a primary concern	
Top Management within Business Plans	**Strategic Decision-Making** – The process of making long-term decisions that shape the direction of the organization. AI provides data-driven insights, scenario analysis, and risk assessments to support leaders	Offers tailored strategic modeling while securing proprietary decision-making frameworks	High-level strategic planning involves confidential corporate initiatives	Provides accessible decision-making tools using industry-wide trends	Conducting preliminary strategic assessments in a non-sensitive environment	Rajabion, (2018), Joudat & Lighvan (2021), Alshadoodee, et. al. (2022), Eboigbe, Farayola, Olatoye, Nnabugwu & Daraojimba (2023), Alabi (2024), Figueiredo (2024), Badmus, et.al. (2024), Kokare et. al. (2024)
	Market Positioning – AI helps companies adjust strategies based on competitive analysis	Provides exclusive market intelligence and strategic recommendations	Refining market positioning for long-term competitive advantage	Offers general market analysis tools for broad positioning strategies	Gaining industry insights without requiring proprietary market intelligence	
	Performance Monitoring – Tracking and evaluating organizational performance against goals. AI automates data collection, analyzes key performance indicators, and identifies areas for improvement	Ensures confidentiality in business performance metrics and operational assessments	Evaluating company performance in a competitive or highly regulated industry	Provides general performance tracking tools for operational insights	Monitoring standard performance benchmarks in non-sensitive business functions	

Source: own elaboration.

6. CONCLUSION

The analysis of the literature on the subject allow to divide the main research contributions into 6 clusters. This shows that the interest of researchers in the study of AI is certainly very varied and, in particular, 3 clusters – clusters 3, 4 and 6 – are strongly focused on the application of AI in business management, innovation development and marketing of companies. The topic of AI is therefore decisively involving companies and all organizations in search of efficiency and process improvement.

How and why to use AI in business management is one of the complex choices that can be resolved by following an organic sequence that starts from the study of the company's organization, from the analysis of functions and processes, follows the identification of organizational priorities and critical issues and ends with the framing of the organization's skills and the identification of the skills to be acquired, also in light of the AI systems to be integrated.

The research results presented in Table 1 highlight important points that on the one hand allow us to better understand the possibilities of applying AI to business processes and on the other hand show the complexity of integrating these systems into business management. It is advisable to know the company, and try to understand which functions or processes to 'integrate' through AI support. In some cases, therefore, human activity can be replaced, and in others, integrated. Regardless of the technologies used, in organizations the critical elements that involve management in the choices for business management are always the same: the complexity of the processes, the management of information, privacy, the involvement of employees and customers in decisions, the times of implementation of the activities but also the quality of the data to be analyzed and the information obtainable, as well as the training and management of human resources. Managing these critical elements in companies with the support of AI can support the quality of the value proposition, the relationship with the customer and, in general, the opportunity for the company to achieve competitive advantage. Whatever the AI model is applied, to avoid problems and security risks it is essential to implement corporate policies that regulate the use of AI, ensuring that only authorized tools are adopted in business processes by limiting the use of freely adopted open-source tools for specific activities, even marginal ones.

Managers must know which processes require a higher level of human attention and sensitivity and, above all, on which to apply an open-source or a private AI. The adoption of open-source or private systems depends on the specific needs of the company: while open-source AI guarantees scalability and cost-effectiveness, private AI offers greater security and control. A hybrid approach presents itself as an ideal solution, allowing to combine the strengths of both options. This model allows to exploit the advantages of both systems, maintaining flexibility, security and regulatory compliance. There are many aspects still to be studied in this sense, especially trying to understand how to integrate the systems with each other, how open could be the open-source AI should interact with private systems, more closed and limited.

Due to its features, Open-Source AI is the best choice for startups as well as established organizations that intend to implement AI solutions in a cost-effective way. Although they must remember to evaluate carefully in areas that are mission-critical for the business, due to the weaknesses of the solution in terms of data security and regulatory compliance. Private AI, on the other hand, offers greater control, but is associated with high development and maintenance costs. Therefore, it is a solution directed to companies operating in highly regulated sectors, such as finance or healthcare. Often, the cost of Private AI, limits the possibility of its use to only large entities that have advanced technological solutions and high financial resources.

Integrating solutions across the various areas of a company's operations, as presented in Table 1, enables the development of a personalized hybrid model that combines the advantages of both Open-Source AI and Private AI. Managers should use Open-Source AI in processes that do not require data protection, and Private AI in areas that require special confidentiality. This would allow organizations to create a stable and secure environment in which they could develop. This approach promotes more effective AI integration in enterprises, while ensuring data protection, compliance with regulations, and competitive advantage.

As AI technology advances, companies should implement flexible strategies that are adapted to changing trends, industry standards, and technological innovations. While maintaining a balance between innovation, security, and cost optimization.

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REFERENCES

Abdeldayem, M. M., AlDeeb, H. M., Sharif, I. M., & Aldulaimi, S. H. (2024, January). Examining the impact of Total Quality Management on competitive advantage: A case study of a private company in the Kingdom of Bahrain. *In 2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)*, 329–333.

Abou-Foul, M., Ruiz-Alba, J. L., & López-Tenorio, P. J. (2023). The impact of artificial intelligence capabilities on servitization: The moderating role of absorptive capacity-A dynamic capabilities perspective. *Journal of Business Research*, *157*.

Acharjee, P. B., Salunkhe, H. A., Thorat, S., Dhote, R., Khnbhadiya, P., Manchanda, A., & Sharma, N. (2024, March). Artificial Intelligence (AI) in CRM (Customer Relationship Management): A Sentiment Analysis Approach. *In 2024 International Conference on Trends in Quantum Computing and Emerging Business Technologies,* 1–5, IEEE.

Addy, W. A., Ajayi-Nifise, A. O., Bello, B. G., Tula, S. T., Odeyemi, O., & Falaiye, T. (2024). AI in credit scoring: A comprehensive review of models and predictive analytics. *Global Journal of Engineering and Technology Advances*, *18*(02), 118-129.

Afroogh, S., Akbari, A., Malone, E., Kargar, M., & Alambeigi, H. (2024). Trust in AI: Progress, Challenges, and Future Directions. *arXiv preprint arXiv:2403*.14680.

Alabi M. (2024). Data-Driven Product Strategy: Leveraging AI to Forecast Market Trends and Identify Emerging Opportunities.

AlAfnan, M. A. (2025). DeepSeek Vs. ChatGPT: A Comparative Evaluation of AI Tools in Composition, Business Writing, and Communication Tasks. *Journal of Artificial Intelligence and Technology*.

Alkan, B. Ş. (2022). How blockchain and artificial intelligence will effect the cloud-based accounting information systems?. *In The Impact of Artificial Intelligence on Governance, Economics and Finance, Volume 2*, 107-119, Singapore: Springer Nature Singapore.

Alsaadi, M., Almashhadany, M. T., Obaed, A. S., Furaijl, H. B., Kamil, S., & Ahmed, S. R. (2024, November). AI-Based Predictive Analytics for Financial Risk Management. *In 2024 8th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT)*, 1-7, IEEE.

Alsaif, A., & Sabih Aksoy, M. (2023). AI-HRM: artificial intelligence in human resource management: a literature review. *Journal of Computing and Communication, 2(2)*, 1-7.

Alshadoodee, H. A. A., Mansoor, M. S. G., Kuba, H. K., & Gheni, H. M. (2022). The role of artificial intelligence in enhancing administrative decision support systems by depend on knowledge management. *Bulletin of Electrical Engineering and Informatics, 11(6),* 3577-3589.

Altaie, M. R., & Dishar, M. M. (2024). Integration of Artificial Intelligence Applications and Knowledge Management Processes for Construction Projects Management. *Civil Engineering Journal, 10(3),* 738-756.

Aminabadi, S. S., Tabatabai, P., Steiner, A., Gruber, D. P., Friesenbichler, W., Habersohn, C., & Berger-Weber, G. (2022). Industry 4.0 in-line AI quality control of plastic injection molded parts. *Polymers, 14(17),* 3551.

Babina, T., Fedyk, A., He, A., & Hodson, J. (2024). Artificial intelligence, firm growth, and product innovation. *Journal of Financial Economics, 151*, 103745.

Badmus O., Rajput S.A., Arogundade J.B. & Williams M. (2024). AI-driven business analytics and decision making, *World Journal of Advanced Research and Reviews.*

Beheshti, A., Benatallah, B., Sheng, Q. Z., Casati, F., Nezhad, H. R. M., Yang, J., & Ghose, A. (2021, November). Ai-enabled processes: The age of artificial intelligence and big data. *In International Conference on Service-Oriented Computing*, 321-335, Cham: Springer International Publishing.

Benhamou, Y. (2024). Open Source AI: Does the Copyleft Clause Propagate to Proprietary AI Models? Revisiting the Definition of Derivatives in the AI-context.

Beverungen, D., Hess, T., Köster, A., & Lehrer, C. (2022). From private digital platforms to public data spaces: implications for the digital transformation. *Electronic Markets, 32(2)*, 493-501.

Bhavani, G. (2020, July). Artificial Intelligence: Simulations in Audit Education. *In 2020 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT)*, 1-5. IEEE.

Bickley, S. J., Macintyre, A., & Torgler, B. (2024). Artificial intelligence and big data in sustainable entrepreneurship. *Journal of Economic Surveys*.

Blind, K., Böhm, M., Grzegorzewska, P., Katz, A., Muto, S., Pätsch, S., & Schubert, T. (2021). The impact of Open Source Software and Hardware on technological independence, competitiveness and innovation in the EU economy. Final Study Report. European Commission, Brussels, DOI, 10, 430161.

Blut, M., Wünderlich, N. V., & Brock, C. (2024). Facilitating retail customers' use of AI-based virtual assistants: A meta-analysis. *Journal of Retailing*.

Borisova, V., Taymashanov, K., & Tasueva, T. (2019). Digital warehousing as a leading logistics potential. *In Sustainable Leadership for Entrepreneurs and Academics: 2018 Prague Institute for Qualification Enhancement (PRIZK) International Conference "Entrepreneurial and Sustainable Academic Leadership"(ESAL2018),* 279-287. Springer International Publishing.

Boute, R. N., & Udenio, M. (2022). AI in logistics and supply chain management. *In Global logistics and supply chain strategies for the 2020s: Vital skills for the next generation,* 49-65. Cham: Springer International Publishing.

Broekhuizen, T., Dekker, H., de Faria, P., Firk, S., Nguyen, D. K., & Sofka, W. (2023). AI for managing open innovation: Opportunities, challenges, and a research agenda. *Journal of Business Research, 167*, 114196.

Butler, T., & O'Brien, L. (2019). Artificial intelligence for regulatory compliance: Are we there yet?. *Journal of Financial Compliance, 3(1),* 44-59.

Camarena, S. (2022). Artificial Intelligence (AI) for sustainable institutional food systems: implementation of AI tools for school nutrition program management in the United States of America. *Frontiers in Sustainable Food Systems, 6*, 743810.

Chaiwong, N., & Srisai, A. (2024). Risk Management using AI: Developing Robust Models for Identifying and Mitigating Emerging Financial Risks. *Asian American Research Letters Journal, 1(7)*, 33-40.

Choudhuri, S. S. (2022). AI-Driven Supply Chain Optimization: Enhancing Inventory Management, Demand Forecasting, and Logistics within ERP Systems.

Concepcion, R. S., Bedruz, R. A. R., Culaba, A. B., Dadios, E. P., & Pascua, A. R. A. R. (2019, November). The technology adoption and governance of artificial intelligence in the Philippines. *In 2019 IEEE 11th international conference on humanoid, nanotechnology, information technology, communication and control, environment, and management (HNICEM)*, 1-10. IEEE.

Cooper, R. G. (2024). *How to transform your new-product development with AI: From vision to deployment*. ISBM (Institute for the Study of Business Markets).

Cooper, R. G. (2025). SMEs' use of AI for new product development: Adoption rates by application and readiness-to-adopt. *Industrial Marketing Management, 126*, 159-167.

Cristianini, N. (2024). *Machina Sapiens*, il Mulino.

Cubric, M., & Li, F. (2024). Bridging the 'Concept–Product'gap in new product development: Emerging insights from the application of artificial intelligence in FinTech SMEs. *Technovation, 134*, 103017.

Cunha, J., Duarte, R., Lopes, J., Guimarães, T., & Santos, M. (2024). Transforming Healthcare Data: How OpenEHR is Revolutionizing AI-Driven Business Analytics. *Procedia Computer Science, 251*, 690-695.

Don-Yehiya, S., Burtenshaw, B., Astudillo, R. F., Osborne, C., Jaiswal, M., Kuo, T. S., ... & Choshen, L. (2024). The Future of Open Human Feedback. *arXiv preprint arXiv:2408*.16961.

Dopamu, O., Adesiyan, J., & Oke, F. (2024). Artificial intelligence and US financial institutions: review of AI-assisted regulatory compliance for cybersecurity. *World Journal of Advanced Research and Reviews, 21(3)*, 964-979.

Eboigbe, E.O., Farayola, O.A., Olatoye, F.O., Nnabugwu, O.Ch. & Daraojimba, Ch. (2023). Business Intelligence transformation through AI and Data Analytics, *Engineering Science & Technology Journal, Volume 4, Issue 5*.

Faheem, M. A., Anwer, S., Rayhan, Z., Ullah, M. A., Paudel, R., Ahmed, M. F., & Khan, H. (2024). AI-Driven Innovation In HRM And Its Impact On Business Management: An In-Depth Study Of Technology Advancement And Strategic Implementation. *Nanotechnology Perceptions, 20*, 1174-1204.

Figueiredo, P. C. N. (Ed.). (2024). Complex AI dynamics and interactions in management. IGI Global.

Fu, Y., Foell, S., Xu, X., & Hiniker, A. (2024, May). From Text to Self: Users' Perception of AIMC Tools on Interpersonal Communication and Self. *In Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems,* 1-17.

Gaur, N., Maurya, A., & Choubey, A. K. (2024, February). Cloud Computing and its impact on the Private Label Business of Dabur India Ltd. *In 2024 4th International Conference on Innovative Practices in Technology and Management (ICIPTM)*, 1-5. IEEE.

Gildhiyal, S., & Prasad, R. (2023, February). The Task based Human Resource Control and Management Model using AI based Deep Learning Model. *In 2023 IEEE International Conference on Integrated Circuits and Communication Systems (ICICACS)*, 1-7. IEEE.

Goel, R., Sahai, S., Venaik, A., & Benfadel, M. (2021). Challenges to HR 4.0 in the global business scenario. In Financial intelligence in human resources management, 53-70. Apple Academic Press.

Gomathi, S., Sabale, A., & Chilamkurti, N. (2023). The Impact of Implementing Artificial Intelligence in Human Resource Management: A Theoretical and Conceptual Framework. In Disruptive Artificial Intelligence and Sustainable Human Resource Management, 139-154. River Publishers.

Govindarajan, S. (2024). Integrating AI and Machine Learning into Product Development Processes.

Gryncewicz, W., Zygała, R., & Pilch, A. (2023). AI in HRM: case study analysis. Preliminary research. *Procedia Computer Science, 225*, 2351-2360.

Gupta, A., & Agarwal, P. (2024, May). Enhancing sales forecasting accuracy through integrated enterprise resource planning and customer relationship management using artificial intelligence. *In 2024 3rd International Conference on Artificial Intelligence For Internet of Things (AIIoT),* 1-6. IEEE.

Gusev, A. (2020). New cyberattacks vectors of Russian critical infrastructure enterprises: Domestic private banking sector view within AI protection methods. *Procedia Computer Science, 169*, 314-319.

Hemalatha, R., Amulya, G., & Lalitha, C. H. S. (2024, November). AI-Driven Customer Segmentation for Personalized Marketing. *In 2024 Second International Conference Computational and Characterization Techniques in Engineering & Sciences (IC3TES)*, 1-5. IEEE.

Hu, Y., & Min, H. K. (2023). The dark side of artificial intelligence in service: The "watching-eye" effect and privacy concerns. *International Journal of Hospitality Management, 110*, 103437.

Ibeneme, S., Okeibunor, J., Muneene, D., Husain, I., Bento, P., Gaju, C., ... & Makubalo, L. (2021, November). Data revolution, health status transformation and the role of artificial intelligence for health and pandemic preparedness in the African context. *In BMC proceedings (Vol. 15),* 1-12. BioMed Central.

IDC (2024), IDC: Artificial Intelligence Will Contribute $19.9 Trillion to the Global Economy through 2030 and Drive 3.5% of Global GDP in 2030, https://www.idc.com/getdoc.jsp?containerId=prUS52600524.

Iwamoto, T. (2019, August). Development of the HRTech market in Japan. *In 2019 Portland International Conference on Management of Engineering and Technology (PICMET)*, 1-4. IEEE.

Jada, I., & Mayayise, T. O. (2023). The impact of artificial intelligence on organisational cyber security: An outcome of a systematic literature review. *Data and Information Management*, 100063.

Jain, V., & Kulkarni, P. A. (2023). Integrating AI techniques for enhanced financial forecasting and budgeting strategies. *International Journal of Economics and Management Studies, 10(09)*, 9-15.

Jermsittiparsert, K., Phongkraphan, N., & Lekhawichit, N. (Eds.). (2024). Consumer and Organizational Behavior in the Age of AI. IGI Global.

Jorzik, P., Klein, S. P., Kanbach, D. K., & Kraus, S. (2024). AI-driven business model innovation: A systematic review and research agenda. *Journal of Business Research, 182*, 114764.

Joudat, B., & Lighvan, M. Z. (2021). The Role of Machine Learning in IIoT Through FPGAs. AI-Enabled Threat Detection and Security Analysis for Industrial IoT, 121-137.

Julius, K., & Christabel, M. (2020). Effectiveness and efficiency of artificial intelligence in boosting customs performance: a case study of RECTS at Uganda Customs administration. *World Customs Journal, 14(2)*, 177-192.

Kadhim, Y. A., & Al Ani, S. A. M. (2023, December). Using artificial intelligence and metaverse techniques to reduce earning management. *In International Multi-Disciplinary Conference-Integrated Sciences and Technologies*, 171-189. Cham: Springer Nature Switzerland.

Kagalwala, H., Radhakrishnan, G. V., Mohammed, I. A., Kothinti, R. R., & Kulkarni, N. (2025). Predictive analytics in supply chain management: The role of AI and machine learning in demand forecasting. *Advances in Consumer Research, 2*, 142-149.

Khan, H. U., Malik, M. Z., & Khan, S. (2022). Systematic analysis of risk associated with supply chain operations using blockchain technology. *Wireless Communications and Mobile Computing, 2022(1)*, 6916048.

Khang, A., Abdullayev, V., Jadhav, B., Gupta, S., & Morris, G. (Eds.). (2023). AI-Centric Modeling and Analytics: Concepts, Technologies, and Applications. CRC Press.

Khowaja, S. A., Dev, K., Qureshi, N. M. F., Khuwaja, P., & Foschini, L. (2022). Toward industrial private AI: A two-tier framework for data and model security. *IEEE Wireless Communications, 29(2),* 76-83.

Kocakoç, I. D. (2022). The role of artificial intelligence in health care. *In The Impact of Artificial Intelligence on Governance, Economics and Finance, Volume 2*, 189-206. Singapore: Springer Nature Singapore.

Kokare, K., Pimpale, S., Kapadnis, N., Navghare, P., Raigar, D., & Urane, K. R. (2024, November). Trading Insight AI: An Intelligent Research Tool Revolutionizing Financial Analysis with AI and NLP. *In 3rd International Conference on Optimization Techniques in the Field of Engineering (ICOFE-2024).*

Kose, U., & Demirezen, M. U. (Eds.). (2024). Artificial Intelligence: Technical and Societal Advancements. CRC Press.

Kumar, P., & Kumar, V. (2023, November). Enhancing Supplier Selection through Explainable AI: A Transparent and Interpretable Approach. *In 2023 International Conference on Research Methodologies in Knowledge Management, Artificial Intelligence and Telecommunication Engineering (RMKMATE)*, 1-6. IEEE.

Kumar, V., Ashraf, A. R., & Nadeem, W. (2024). AI-powered marketing: What, where, and how?. *International Journal of Information Management*, 102783.

Lang, V. (2021). Digital Fluency: Understanding the basics of artificial intelligence, blockchain technology, quantum computing, and their applications for digital transformation. Pfaffenhofen, Germany: A press.

Laraki, N., Schaus, P., & Deville, Y. (2024). Exploring open source AI-OCR for efficient personnel invoice verification.

Lauter, K. (2022). Private AI: machine learning on encrypted data. In Recent Advances in Industrial and Applied Mathematics, 97-113. Cham: Springer International Publishing.

Ledro, C., Nosella, A., & Dalla Pozza, I. (2023). Integration of AI in CRM: Challenges and guidelines. *Journal of Open Innovation: Technology, Market, and Complexity, 9(4)*, 100151.

Lee, M. E., Hayes, D., & Maher, C. S. (2024). AI as a Budgeting Tool. *Public Finance, 1*.

Lifshitz-Assaf, H., & Nagle, F. (2021). The digital economy runs on open source. Here's how to protect it. *Harvard Business Review, 2*.

Ma, Z., & Wang, Y. (2024). Optimizing Quality Control on Electric Vehicle Production Lines with AI and Machine Learning.

Mahatme, V. P., & Bhoyar, K. K. (2016, December). Data mining with fuzzy method towards intelligent questions categorization in E-Learning. *In 2016 8th International Conference on Computational Intelligence and Communication Networks (CICN)*, 682-687. IEEE.

Marion, T., Yuan, C., & Moghaddam, M. (2025). Integrating AI into the Front End of New Product Development: A Case Comparison of Traditional and Augmented Processes. *Research-Technology Management, 68(2)*, 10-22.

Marsden, P. (2019). Digital quality management in construction. Routledge.

Mikalef, P., Fjørtoft, S. O., & Torvatn, H. Y. (2019). Artificial Intelligence in the public sector: a study of challenges and opportunities for Norwegian municipalities. *In Digital Transformation for a Sustainable Society in the 21st Century: 18th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2019, Trondheim, Norway, Proceedings 18*, 267-277). Springer International Publishing.

Mittal, S., Chandel, A., & Nguyen, P. M. (2025). AI and social media analytics: Leveraging real-time data for entrepreneurial growth. In Improving Entrepreneurial Processes Through Advanced AI, 267-290. IGI Global.

MIT Technology Review. (2024, August 22). We finally have a definition for open-source AI. MIT Technology Review, Retrieved from: https://www.technologyreview.com/2024/08/22/1097224/we-finally-have-a-definition-for-open-source-ai/ (03.03.2025).

Mukhopadhyay, S., Singh, R. K., & Jain, T. (2024). Developing artificial intelligence enabled Marketing 4.0 framework: an Industry 4.0 perspective. *Qualitative Market Research: An International Journal*.

Nalini, M., Radhakrishnan, D. P., Yogi, G., Santhiya, S., & Harivardhini, V. (2021). Impact of artificial intelligence (AI) on marketing. *Int. J. of Aquatic Science, 12(2),* 3159-3167.

Nayak, B., Singh, T., Baral, S. K., Goel, R., & Hota, P. (2023, February). An Exploratory Study on the Impact of Digital Marketing and Innovations on E-commerce Mechanism. In International Conference on Intelligent Computing and Networking, 31-45. Singapore: Springer Nature Singapore.

Nikita, G., & Velicheti, S. N. (2022, February). AI as a tool in internal communication to reduce employee attrition rate in India. *In Achieving $5 Trillion Economy of India: Proceedings of 11th Annual International Research Conference of Symbiosis Institute of Management Studies*, 43-62. Singapore: Springer Nature Singapore.

Okeleke, P. A., Ajiga, D., Folorunsho, S. O., & Ezeigweneme, C. (2024). Predictive analytics for market trends using AI: A study in consumer behavior. *International Journal of Engineering Research Updates, 7(1),* 36-49.

Ozay, D., Jahanbakht, M., Shoomal, A., & Wang, S. (2024). Artificial Intelligence (AI)-based Customer Relationship Management (CRM): a comprehensive bibliometric and systematic literature review with outlook on future research. *Enterprise Information Systems, 18(7),* 2351869.

Pallathadka, H., Ramirez-Asis, E. H., Loli-Poma, T. P., Kaliyaperumal, K., Ventayen, R. J. M., & Naved, M. (2023). Applications of artificial intelligence in business management, e-commerce and finance. Materials Today: Proceedings, 80, 2610-2613.

Pattanayak S. K. (2021). Leveraging Generative AI for Ehanced Market Analysis: A New Paradigm for Business Consulting, *International Journal of All Research Education and Scientific Methods, Volume 9, Issue 9*.

Perdanakusuma, D., Puspitasari, W., & Saputra, M. (2020, July). Utilizing Open ERP for Creating Medical Record Management System in Smart Hospital: A Case Study. *In 2020 IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communications Technology (IAICT)*, 1-7. IEEE.

Ping, G., Zhu, M., Ling, Z., & Niu, K. (2024). Research on optimizing logistics transportation routes using AI large models. *Spectrum of Research, 4(1)*.

Radonjić, A., Duarte, H., & Pereira, N. (2024). Artificial intelligence and HRM: HR managers' perspective on decisiveness and challenges. *European Management Journal, 42(1),* 57-66.

Rajabion, L. (2018, December). Application and adoption of big data technologies in SMEs. *In 2018 international conference on computational science and computational intelligence (CSCI)*, 1133-1135. IEEE.

Rajaguru, R. (2024). Effects of contemporary technologies, such as blockchain and artificial intelligence (AI) in enhancing consumers' trustworthiness of online reviews. *Journal of Hospitality Marketing & Management, 33(2)*, 251-259.

Rajakumari, K., Hamsagsayathri, P., & Shanmugapriya, S. (2023). 6 Features, Key Challenges, and Applications of Open-Source Data Fabric Platforms. *Data Fabric Architectures: Web-Driven Applications, 115*.

Raji M.A., Olodo H.B., Oke T.T., Addy W.A., Ofodile O.Ch. & Oyewole A.T. (2024). *E-commerce and customer behavior: A review of AI-powered personalization and market trends*, GSC Advances Research and Reviews.

Rane, N., Choudhary, S., & Rane, J. (2023). Enhanced product design and development using Artificial Intelligence (AI), virtual reality (VR), augmented reality (AR), 4D/5d/6d printing, internet of things (IOT), and Blockchain: A review. Virtual Reality (VR), *Augmented Reality (AR) D, 4*.

Roberts, T., & Tonna, S. J. (2022). *Risk modeling: practical applications of artificial intelligence, machine learning, and deep learning.* John Wiley & Sons.

Sanz, J. L., & Zhu, Y. (2021, September). Toward scalable artificial intelligence in finance. *In 2021 IEEE International Conference on Services Computing (SCC)*, 460-469. IEEE.

Saouabe, A., Oualla, H., Mazar, M., & Messadia, M. (2024, December). Evolution of Human Resources Management Methods: From Traditional Approaches to Generative Artificial Intelligence. *In 2024 International Conference on Decision Aid Sciences and Applications (DASA),* 1-5. IEEE.

Seger, E., Dreksler, N., Moulange, R., Dardaman, E., Schuett, J., Wei, K., ... & Gupta, A. (2023). Open-sourcing highly capable foundation models: An evaluation of risks, benefits, and alternative methods for pursuing open-source objectives. *arXiv preprint arXiv:2311*.09227.

Sharma, A., Patel, N., & Gupta, R. (2022). Enhancing customer segmentation through AI: Analyzing clustering algorithms and deep learning techniques. *European Advanced AI Journal, 11(8).*

Singh, G., Sao, A., Singh, S., & Hinchey, M. (2023, November). AI-Enhanced SEM Analysis: Evaluating E-CRM's Effect on Customer Experience in NCR's Private Banking Sector. *In 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS)*, 957-962. IEEE.

Singh, N., & Adhikari, D. (2023). AI-Driven Social Media Analytics for eCommerce Advertising.

Singh, R., Khan, S., Kumar, A., & Kumar, V. (Eds.). (2024). Artificial Intelligence Enabled Management: An Emerging Economy Perspective. Walter de Gruyter GmbH & Co KG.

Standford University (2024), Artificial Intelligence Index Report 2024. Retieved from: https://aiindex.stanford.edu/report/ (03.03.2025).

Sträßer, J., & Stolicna, Z. (2023). Knowledge Management of Private Banks as an Asset Improved by Artificial Intelligence Discipline—Applied to Strategic McKinsey Portfolio Concept as Part of the Portfolio Management. *In Developments in Information and Knowledge Management Systems for Business Applications: Volume 7*, 375-399. Cham: Springer Nature Switzerland.

Subin S. (2025), *Tech megacaps plan to spend more than $300 billion in 2025 as AI race intensifies*. Retrieved from: https://www.cnbc.com/2025/02/08/tech-megacaps-to-spend-more-than-300-billion-in-2025-to-win-in-ai.html (03.03.2025).

Thakur, A., Hinge, P., & Adhegaonkar, V. (2023, May). Use of Artificial Intelligence (AI) in recruitment and selection. *In International Conference on Applications of Machine Intelligence and Data Analytics (ICAMIDA 2022)*, 632-640. Atlantis Press.

Thompson, R. (2018, October). Maximizing content with cloud, virtualization and AI. *In SMPTE 2018*, 1-8. SMPTE.

Trabelsi, M.A. (2024). The impact of artificial intelligence on economic development. *Journal of Electronic Business & Digital Economics, 3 (2),* 142-155.

Turlacu, L., Chivu, R., Stoica, I., Orzan, G., & Herrezeel, T. (2018). Digital (R) evolution: From 2.0 to 4.0. Perspective and challenges for the Romanian market. *In Proceedings of the 32nd International Business Information Management Association Conference, IBIMA 2018-Vision 2020: Sustainable Economic Development and Application of Innovation Management from Regional expansion to Global Growth*, 6684-6693.

Tursunbayeva, A., & Gal, H. C. B. (2024). Adoption of artificial intelligence: A TOP framework-based checklist for digital leaders. *Business Horizons, 67 (4),* 357-368.

Vake, D., Šinik, B., Vičič, J., & Tošić, A. (2025). Is Open Source the Future of AI? A Data-Driven Approach. *Applied Sciences, 15(5),* 2790.

Van Bekkum, M., & Borgesius, F. Z. (2023). Using sensitive data to prevent discrimination by artificial intelligence: Does the GDPR need a new exception? *Computer Law & Security Review, 48*, 105770.

Villegas-Ch, W., Navarro, A. M., & Sanchez-Viteri, S. (2024). Optimization of inventory management through computer vision and machine learning technologies. *Intelligent Systems with Applications, 24*, 200438.

Wang, P., Li, K., Du, Q., & Wang, J. (2024). Customer experience in AI-enabled products: Scale development and validation. *Journal of Retailing and Consumer Services, 76*, 103578.

Wei, L. (2017). Parking planning and management strategy based on artificial intelligence. *AGRO FOOD INDUSTRY HI-TECH, 28(1)*, 2298-2302.

Widder, D. G., & Nafus, D. (2023). Dislocated accountabilities in the "AI supply chain": Modularity and developers' notions of responsibility. *Big Data & Society, 10(1)*.

Yafooz, W. M., & Al-Gumaei, Y. (2025). AI-Driven: Social Media Analytics and Cybersecurity.

Yan, X., Wang, Z., Puvvada, M. M., Dinar, M., Rosen, D. W., & Melkote, S. N. (2024). A federated learning approach to automated and secure supplier selection in cyber manufacturing as-a-service. *Journal of Manufacturing Systems, 77*, 170-183.

Yang, H., Zhang, B., Wang, N., Guo, C., Zhang, X., Lin, L., ... & Wang, C. D. (2024). FinRobot: an open-source AI agent platform for financial applications using large language models. *arXiv preprint arXiv:2405*.14767.

Zhang, Y., Li, G., Muskat, B., & Law, R. (2021). Tourism demand forecasting: A decomposed deep learning approach. *Journal of Travel Research, 60(5),* 981-997.