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The Contribution of Artificial Intelligence to Enhancing Operational Efficiency and Innovation in Iraqi Production Companies - An Analytical Study

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Abstract.
The application of artificial intelligence presents opportunities and challenges for human resources in the sales and marketing department. This study aims to analyze how human resources at the General Company for Automotive Industries in Iraq are dealing with digital transformation in the era of artificial intelligence. The research adopts a qualitative descriptive approach, relying on in-depth interviews, observations, and documents.
This research contributes to current practices and academic studies on the application of artificial intelligence, highlighting how industrial companies coordinate AI resources and capabilities to drive the digital transformation of the organization, while creating a competitive advantage.
The data collected is analyzed using the interactive model approach by (Miles and Huberman .1994), which involves three main stages: data reduction, data display, and conclusion drawing and verification. The findings indicate that AI enhances operational efficiency and service personalization but faces challenges such as employee resistance and a digital skills gap. Continuous training strategies and adaptive AI integration are essential for the successful implementation of this technology.
Keywords: Artificial Intelligence, Transformation Strategies, General Automotive Manufacturer, Human Resources, Sales and Marketing.

Introdution:Organizations' digital transformation is being significantly impacted by artificial intelligence (AI) "(Kraus et al., 2022). The application of AI technologies has revolutionized the manufacturing sector" (Bokrantz et al., 2023).

The term artificial intelligence (AI) describes a particular set of computational methods that enable systems to perform a range of tasks that were previously believed to be exclusive to human intelligence, including speech recognition, visual information recognition, language translation, and decision-making. Through complex data processing, artificial intelligence techniques like machine learning and deep learning help computers learn and grow. For ease of analysis, machine learning, deep learning, and other related methods and technologies shall be referred to in this work as "artificial intelligence," or AI. (L. Iliadis, et al., 2019).

While many business executives think AI will affect their operations, most concur that AI will increase their productivity and simplify their work. They come to the conclusion that it would

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affect the organizations they manage in the same way. Finding efficient ways to use AI and machine learning is a crucial task for everyone involved in innovation management, even though many businesses hope to be able to use these tools to enhance their operations. On the other hand, it increases the amount of information that businesses need to handle and helps them deal with the growing competition in their environments. AI-enabled innovation promotion could benefit businesses in real ways by lowering the cost and uncertainty of innovation. At the moment, human-organized.

Therefore, it is essential to examine how the human resources in this department respond to these challenges while simultaneously taking advantage of the available opportunities (Al-Hyari et al., 2023). A study by(Gajić et al. 2024) emphasizes that the ability of human resources to adapt to new technologies is key to successfully implementing AI in workplace. The emphasis is that integrating AI into marketing strategies not only enhances efficiency but also significantly expands market reach through predictive analysis and sharper personalization.

However, implementing AI is a complex process that calls for adjustments to management and production methods, which pose serious problems for businesses (Fu et al., 2023; Wang et al., 2023). Since small and medium-sized businesses (SMEs) in the manufacturing sector must make significant adjustments to their internal resources, procedures, and capabilities, this challenge is especially pertinent to them (Dye et al., 2023).AI has the potential to greatly improve SMEs' capacity to overcome obstacles, cooperate and communicate with their suppliers and customers "(Scare et al., 2023), and boost productivity (Abdullah et al., 2021). Supply chain agility (Dye et al., 2023), lower maintenance costs (Velmurugan et al., 2022), and increased

through the lenses of organizational strategy and organizational capabilities (Weber et al., 2023), with specific reference to dynamic capabilities (Martínez de Miguel et al., 2022; Ogunrinde, 2022), the resource-based view (Kumar et al., 2023), and the resource orchestration (RO) theory (Ma et al., 2023").

However, previous studies have not focused on explaining how industrial firms organize the tools needed to use AI technologies in digital operations (Dee and On, 2023).This topic is of particular importance given the difficulty industrial firms in Iraq face in understanding "the impact of AI on their businesses (Andrea and On, 2021)".

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RESEARCH PROBLEM

The overarching issue we are trying to address is how to use AI to uncover ways to innovate in the future. the role of AI in initiating many trailblazing projects, and what the future holds as technology continues to evolve. Most companies don't get AI To bring AI into a company, so it can promote innovation and maintain a competitive advantage, you need to have a suck It's AI or die 70 % of companies are missing from the latest tech craze Task kills companies, do or die.

Much of the problem results not from organizations being unable to execute AI, which should be applied in the operational context that aligns with their business effort, but from the fact that many companies don't know how to do this in practice. They have no idea what tools they'll be able to use in their day-to-day work or how the AI will be woven in. Increased AI education will spur and cause attention to be paid to these more advanced AI tools that make business operations genuinely easier and faster. "According to new research from Boston Consulting Group (BCG) and the MIT Sloan Management Review", businesses are not only misaligned internally on AI, but they're also not investing in the technology at a level that's commensurate with the impact that researchers think it will have on their industries (L. Iliadis, et al., 2019).
According to a global survey of more than 3,000 companies and industry experts, 85% of managers agree that AI would help their companies maintain or increase their competitive edge. However, only about one in five businesses have integrated AI into some of their processes or systems .By identifying the key traits of AI leaders, the most recent study provides organizations with a foundation for developing an AI strategy.
The report states that there are ambitious objectives for artificial intelligence (AI), but it is unclear how companies will meet these targets. Optimism and execution diverge significantly for most businesses. Three-quarters of managers believe AI would make it possible for their businesses to enter emerging markets.

Theoretical background

1- The concept of artificial intelligence

According to(Aghion et al. 2019), artificial intelligence is distinct from naturally intelligent things, such as aeroplanes. properties typically used by non-artisans. Artificial Intelligence (AI) is the study of science and engineering that is used to manufacture intelligent machines and computer programs. It includes the biological and evolutionary aspects of AI as well as the mode of creation of human intelligence. With the exception of AI's lack of biologically observable constraints, the concept of artificial intelligence is based on human intelligence itself .The majority of AI systems are capable of revealing examples, learning from models, and predicting future outcomes for the purpose of direction because they are trained on recorded data. These arrangements and expectations are conjectures based on massive datasets that people would not be able to examine at comparable speed and scale. We define AI as "a system' ability to interpret external data

Czech
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correctly, to learn from such data, and to use those to achieve specific goals and tasks through flexible adaptation" "(Kaplan & Haenlein, 2019, p. 17)".
It is defined as: systems capable of analyzing different environments, making independent decisions, and performing tasks in a manner that mimics human cognition. (Kaplan, 2019).
" Knowledge of Artificial Intelligence AI is a technique that can identify the right value based on the datasets that are provided to it. Therefore, it is a tool rather than an end in and of itself and will not eliminate the roles that humans play in any endeavor. There is a significant disparity between the number of businesses using AI, which is growing quickly, and the much smaller number of AI businesses in manufacturing (Kaplan, 2019). Businesses that have implemented AI have seen notable increases in sales and employment. Examples exist. Starbucks, for instance, is recognized as a pioneer in AI, reporting 15–17% growth over the past two years despite only 8% store development".

2-Artificial Intelligence in Manufacturing and Production

Businesses are promoting AI-based digital transformation strategies to foster "digital innovation (Kim & Kim, 2022"). Notably, because AI implementation increases productivity and improves firm performance, businesses' "digital transformation through AI has become more and more important in the manufacturing sector (Ahmad et al., 2022").
It is widely believed that the new modern transformation and the new specialized insurgency are gaining ground. We believe that another era of "Web in addition to Artificial Intelligence (AI)" is not too far off, distinguished by mass development, information-driven, shared administrations, cross-line coordination, mechanized knowledge, and ubiquitous organizations. The nation's economy, people's careers, and public safety all depend on assembly. The profound combination of assembling innovation with data correspondence innovation, savvy innovation, and item related aptitude specifically is allowing for a game-evolving shift in the areas of biological systems, fabrication strategies, and model assembly (Ibrahim et al., 2021).In addition to helping humanity, this cutting-edge technology significantly simplifies the infrastructure for human labor.
According to Johnson (2019), modern and coordination frameworks rely on progressive, unavoidable, and amazing figuring organizations to function. Within these organizations, sensors, machines, frameworks, intelligent devices, and people are constantly expanding the amount of information. Due to growing PC capabilities, large data is being analyzed more quickly, extensively, and profoundly than ever before. Putting together frameworks for issue identification, support, and computerized visual assessments has begun to make use of deep learning advancements and advanced cognitive processing.
Frameworks and creation planning are effectively addressed by support learning approaches. Companies are looking for ways to combine AI philosophies with traditional Operational Research methodology in order to turn constant information into meaningful decisions. Double-dealing with information for general creation frameworks.
Like AI in educational applications, AM is a rapidly emerging and growing assembling discipline (Marda et al., 2018). Because they are linked to strategic and self-referential/duplicating ideas, both are adaptable. AI-related Cyber-Physical Systems (CPS) use the same osmotic computational process that is used in AM osmotic mass assembling. AM, or computer-based intelligence, is a new field that can be effectively and consistently combined. The review examines recent advancements

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in the field of AM process stream and how they relate to AI applications. This has led to the arrangement of current and planned AI-AM applications as well as a summary of calculated, hierarchical, and modern cycle stages. In this way, the extended strategy makes the capacities, as well as associated association diagrams, for locally and globally distributed material and data transport organizations.

3- Artificial Intelligence's Effect on Innovation

AI is an application that is quickly evolving and used in many different sectors. Many of these creative solutions are already on the market, and many more are in the process of being developed. According to Srinivasan et al. (2014), artificial intelligence (AI) is essentially a support technology that may expedite a variety of learning and problem-solving tasks. Therefore, integrating AI into the innovation environment could change how decisions are made regarding innovation, particularly when it comes to the creation and verification of new ideas (whether they be products, services, or procedures). Design is the term used by academics to describe the decision-making process at the heart of innovation. Actually, in order to "model actions," the design is required.

However, certain AI business models are more complex and constantly changing. Laws, hiring human resources, and data collection are just a few of the challenges that businesses must overcome. Using sensors, automated networks, and algorithms, innovation processes advance even faster as the economy starts to change (Srinivasan et al., 2014). "Modern products are always connected to their company, providing continuous data flows that document various aspects of the user experience, regardless of whether the product is made up entirely of apps, like an iPhone app, or a more traditional hardware-centered system, like a Tesla car. Additionally, the software built into the products enables information to flow in the opposite direction, from the business to the client, creating a customized strategy for every customer while continuously improving" .

4-Research Methodology

This study adopts a qualitative descriptive approach that aims to analyze the opportunities and challenges facing human resources in the sales and marketing department in the era of artificial intelligence at the General Company for Automotive Manufacturing. (S.C.A.I) . This approach was chosen to provide a deeper understanding of perceptions, experiences, and implemented strategies.

Data collection was conducted using various techniques, including in-depth interviews, participant observation, and literature research. In the in-depth interviews, managers and employees were asked about their experiences in dealing with the opportunities and challenges presented by AI.

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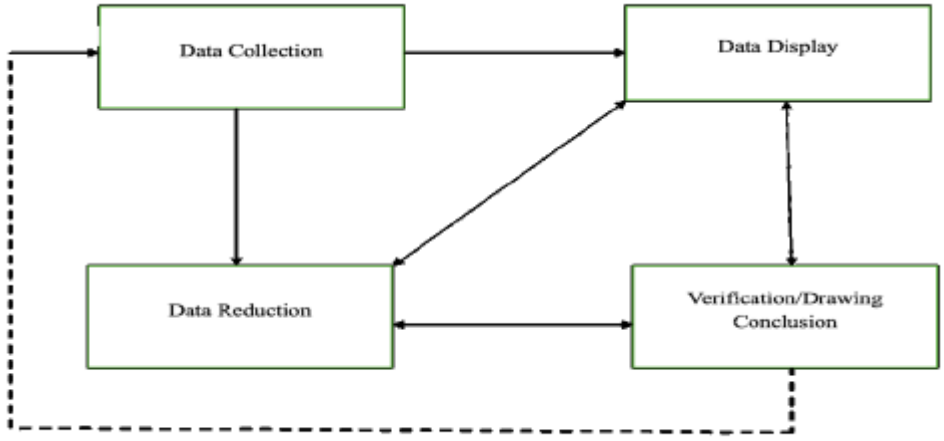
To explore the application of AI technologies in regular business, we conducted participant observation on the work process of the sales and marketing department. Literature review was added in gathering secondary data through internal reports, documents and literature on AI applications.

The data collected were analyzed using the interactive model of analysis developed by Miles and Huberman (1994) and includes three primary components: data reduction, data display, and drawing conclusions/verification. The approach enables systematic analysis of data that involves finding the deeper meaning of data. Data reduction is utilized to select focused data according to the purpose of the study, while data display is presented in descriptive narrative to be able to explain. The themes are used to make interpretations and develop conclusions; in this process patterns, connections, and meanings arising from the data may be identified to provide an understanding that is relevant to the research purpose. It permits a structured interrogation of data to identify a hidden meaning from the data set.

Patterns, relationships, and meanings in the data are used to infer about the phenomenon of interest and be fit the study. This process allows collected data to be methodically examined for underlying significance.

Source and method triangulation were employed to assure the validity of the data.
. Method triangulation integrated the findings of document studies, observations, and interviews, whereas source triangulation compared data from several informants. Additionally, peer debriefing and member checks with informants to confirm the accuracy of the data were used to increase the validity of the data.



Source: Milles & Hubberman, 1994

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6-Finding and Discussion
the General Company for Automotive Manufacturing (S.C.A.I)

Czech
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The General Company for Automotive and Equipment Manufacturing was established in early 2016 as a result of the merger of three businesses: the General Company for Battery Manufacturing, the General Company for Mechanical Industries, and the General Company for Automotive Manufacturing. With the majority of its operations being industrial and agricultural, it is currently focused on engineering industries and is associated with the Ministry of Industry and Minerals. .

The company has very good technical and technological capabilities and potentials. As for the supporting technical departments (technical, research and development, planning, quality control), the organizational departments are (administrative, financial, legal, commercial, organizational, marketing).

For approved investment projects with a total cost of 112.5 billion dinars, they are (the company rehabilitation project, the project to manufacture 40% of tractors, the rolling mill project, the sprinkler irrigation project, in addition to the company owning an integrated residential complex for workers' housing located within the company's properties, in addition to other multiple properties and yards. The company produces, with its manufacturing capabilities, all products that serve the transportation, agriculture, irrigation, services and security sectors with high quality and scientific specifications.

7- Finding

Based on research conducted by the Sales and Marketing Department of the General Company for Automotive Industries, several important findings have been identified regarding the opportunities and challenges facing the era of artificial intelligence. The most prominent of these opportunities is enhancing operational efficiency.

where AI can automate administrative tasks, such as managing customer databases, analyzing market trends, and overseeing digital marketing campaigns (Dogru et al., 2023). It also forces service customization or personalization better by utilizing customer knowledge to deliver more precise and relevant recommendations (Dogru et al., 2023).

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This allows businesses to deliver a more personalized customer experience and to improve customer loyalty. One of the challenges facing the bank is the need to better train its employees in the use of digital skills to keep pace with the adoption of new technologies. A viable strategy is one where artificial intelligence and man-machine interaction coalesce to address heightened customer expectations in the digital era.

"My Dynamic Pricing concept is able to predict this and accommodate it with a flexible adjustment of price in the dynamically competitive market place. AI can even be used to determine which are the peak and off-peak periods, crucial in planning promotions and package deals. Furthermore this technology also enables to grant targeted discounts to regular customers and to search for new market segments with greater precision.

It is that the challenges of putting AI into practice are enormous. Open Access This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made. It seems that new technologies often meet with cultural resistance within businesses, due to this and have to be hammered in with training etc. Additionally, there is a digital skills shortage in the workforce, which further impedes the infusion of this new technology, and calls for ongoing training.

AI integration with existing business process management systems is another challenge. The ability of AI software to work with the company's technology infrastructure – which is not always designed for the latest, greatest technology – is itself a technical obstacle. For this, is required to have upgrades of hardware and software. Local security also serves as a huge concern since a large amount of the client data has to be processed in a safe manner and in compliance with data protective laws (Bakir et al., 2023).

That said, given the numerous positive aspects of AI for boosting efficiencies and personalizing services, implementing it requires a comprehensive approach to change management. Integrating AI: workplace obstacles Ultimately making AI work in the workplace will be about tackling ethical and data security issues, providing ongoing training and actively engaging employees in the digital transformation. Management should also keep clear channels of communication open to ensure that all involved know what the aims and advantages of using AI are.

9-Discussion

Czech
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In this research paper, we highlight the manufacturing sector's trajectory in implementing artificial intelligence at the General Company for Automotive Industries. The study indicates the discovery of new opportunities within the company for innovation in its application.

The application of AI in three dimensions—enhancing operational efficiency, personalizing service, and developing strategic innovation options—significantly facilitates the sales and marketing department at the General Company for Automotive Industries in Iraq.

Despite the Research on industrial organizations has not gotten much attention in the literature, despite the growing interest in AI-driven digital transformation of businesses (Scar et al., 2023).

Such findings are consistent with strategic management theory that the utilization of new technologies, including the use of AI, may contribute to an organization's competitive advantage by facilitating efficient business processes and "data-driven decision making (Dogru et al., 2023; Kim et al., 2025)".

More than simply a support tool, the research reveals how AI is driving strategic innovation and helping other industrial companies to adapt to the effects of changing market conditions. These promising results indicate that companies could enhance their own positions in a fierce industry through effective AI utilization.

These findings are revealing in the sense that the deployment of AI may help boost productivity, but its performance fundamentally relies on how ready HR is to embracing it (Zahidi et al., 2024).

These findings confirm that maximizing operational efficiency and encouraging innovation requires the greatest possible integration between technology and human resources as a path toward sustainable digital transformation. The practical implications of these findings are the need for a systematic approach to change management to address employee resistance. For example, employee concerns about artificial intelligence can be mitigated through ongoing training programs and effective internal communication..

And an approach that incorporates local knowhow can enhance staff commitment through change and boost take-up of technology. Therefore, this research adds to technology adoption theory which may be more applicable to the social and cultural context of the workplace.

There are also challenges in bridging between AI and current management systems: the addition of technology does not always go smoothly. Software compatibility and data security are some technical issues that need personalized consideration (Bakir et al., 2023).

In order to ensure that AI integration is aligned with the strategic needs of Iraqi industries, joint efforts of management, IT and HR are necessary.

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9-Research Contribution

This study differs from previous studies that have examined AI applications in Iraqi industry. One of its strengths is its special focus on exploring new potentials for enhancing competitive advantage and identifying human resource challenges at the General Company for Automotive Industries in Iraq. This study distinguishes itself from other studies that have focused on the adoption of AI in general in the industrial sector alone.

This project focuses on enhancing operational efficiency and innovation in manufacturing companies, and demonstrates technology adoption from a strategic and operational perspective for the General Company for Automotive Industries in Iraq..
Furthermore, this study highlights how AI can be used not only as a driver of operational effectiveness, but also as a catalyst for change in work culture. The study demonstrates how AI impacts work patterns and competitive strategies, something that has not been extensively explored in previous research.
This research also provides a different contextual perspective by examining how AI implementation challenges—such as employee resistance, digital competency gaps, and data security issues—are addressed in the specific Iraqi workplace. This local context is important because it illustrates how organizational culture and management influence the workplace.
Furthermore, this research enriches the literature by integrating a descriptive qualitative approach using Miles and Huber man's data analysis techniques to explore employees' perceptions and experiences in depth.
This provides a more comprehensive "understanding of how AI is implemented in real practice and how adaptation" strategies are developed to address emerging challenges. The study also reveals how local factors such as cultural values, organizational structure, and the level of technological readiness in can influence the effectiveness of AI implementation in the Industry se actor.
Therefore, this research not only provides theoretical contributions to understanding the role of AI in human resource management within the industrial sector, but also provides practical implications that practitioners and policymakers can use to develop more effective strategies to manage technological changes in this sector.

10- Conclusion

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The study is concluded that the role of the Sales and Marketing Department in the Iraq General Automotive Company for Heavy Industries requires concerted efforts towards improving operational efficiency, facilitating innovations, allocating sufficient resources for innovation, and making the right strategic move based on data for the company to adopt artificial intelligence.
However, aside from these advantages, employee pushback against technology implementations, digital skills gaps, and information security issues can prove to be obstacles. These challenges

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highlight the need for a comprehensive change management approach that focuses on continued training and digital up skilling. the Threats to data security over all the contribution of HR and technology is vital to the successful implementation of AI in the General Company for Automotive Industries in Iraq. In today's digital age that are more competitive than ever, strategies that evolve with advancing technology, the active engagement of employees, and a flexible plan are key to overcoming these hurdles.

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