Contributions to Management Science

María Teresa Del Val Núñez
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Artificial Intelligence and Business Transformation

Impact in HR Management, Innovation and Technology Challenges

Springer

Contributions to Management Science

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Foreword

In contemporary society, the pervasive influence of rapid technological advancements necessitates prompt adaptation to evolving environments and imposes novel competency requirements upon individuals. This era of digital proliferation, underpinned by the collaborative efforts of experts, scholars, policymakers, scientists, and organizational leaders, has ushered in unprecedented opportunities for the advancement of corporate departments.

At the forefront of this paradigm shift stands artificial intelligence (AI), a ubiquitous force permeating various domains. Over recent years, the integration of AI has emerged as a pivotal catalyst for organizational growth, spearheading the digital transformation initiatives of enterprises worldwide. While extant literature predominantly examines AI through the lens of machine learning applications, commensurate attention must be devoted to elucidating the challenges arising from its practical implementation and the nascent nature of strategic AI utilization for driving business value creation.

In response to the imperatives of change, companies have embraced innovative strategies, infusing creativity into their strategic decision-making processes to navigate dynamic landscapes successfully. Consequently, business models have undergone profound metamorphoses, striving to enhance competitiveness through strategic recalibrations encompassing organizational design, scale, and core operations. This transformative trajectory has engendered novel considerations regarding the future landscape of work, encompassing the creation of new roles, the imperative to cultivate digital competencies, and the reimagining of team dynamics. Central to this discourse is a nuanced exploration of the human resources (HR) domain, underscored by the profound impact of digitalization on the workforce. Indeed, employees occupy a pivotal role in organizational sustenance and evolution, necessitating an in-depth examination of HR dynamics amidst the backdrop of technological upheaval.

This volume endeavors to scrutinize artificial intelligence from diverse vantage points, charting its manifold impacts and trajectories within the organizational milieu. Structurally, the book is bifurcated into two cardinal sections, each addressing distinct facets of AI's influence on organizational dynamics. The initial segment

elucidates strategies for business transformation, delineating novel pathways for augmenting productivity and profitability. In contrast, the subsequent section delves into the integration of AI within the HR domain, probing both its tangible and intangible ramifications. This holistic inquiry encompasses considerations spanning the creation of new job roles, the imperative to cultivate digital proficiencies, and the imperative to foster innovative paradigms of team management.

As the Vice-President for International Relations at the University of Alcalá, I fervently advocate for scholarly endeavors such as this publication, which epitomizes the commitment to excellence in academic discourse. The richness of content encapsulated within this volume, alongside its diverse array of contributions imbued with global perspectives, augments its scholarly merit and underscores its significance in advancing the frontiers of knowledge.

University of Alcalá
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Julio Cañero Serrano

Artificial Intelligence and Business Transformation

Artificial Intelligence and Business Transformation is a book series composed by the works of professionals where the new trends in this field are contextualized, deepened, and defined. The rapid evolution of the development of artificial intelligence, focused on the field of business development, and more specifically on human resources, reflects new business strategies, innovative tools in business and team management, and current practices in human resources departments. This book is mainly written by professionals in the field, consultants and academics who seek to capture the reality, as well as to generate discussions and reflection on the topic.

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About the Editors

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Part I
Business Transformation

New Lines of Business Development: Artificial Intelligence in Business

José Andrés Gómez Gandía, Cristina Blanco González-Tejero, and Ángel Javier Álvarez Miguel

Abstract This chapter provides an analysis of the different doctrines and learnings framed at the intersection of Artificial Intelligence (AI) and business development. Thus, it explores how AI has evolved to drive the creation of new business opportunities in the dynamic international environment. In the first section, we define AI and its evolutionary trajectory in the context of new business. The fundamentals of AI in business development are broken down in the second section, covering the essential concepts of AI as applied to business management and how this technology empowers the identification of emerging opportunities and trends in the marketplace. Section three examines specific applications of AI in the creation of new lines of business, focusing on the identification of market opportunities. As we move forward, the fourth section explores the strategic integration of AI into the business environment. The importance of a business culture open to innovation and technology is highlighted, along with the implementation of digital transformation strategies to facilitate the effective adoption of AI. The analysis progresses to the fifth section, where the future of AI in business development is projected, highlighting technological advances and the continued potential of AI to create new business opportunities. Finally, the sixth section draws conclusions, recapping the fundamental role of AI in the development of new lines of business, as well as the implications and challenges facing companies and entrepreneurs in this era of AI-driven transformation. Taken together, this analysis highlights how AI has emerged as an essential tool for innovation and business strategy, triggering an ever-evolving landscape.

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1 Introduction

The pursuit of new lines of business development has been significantly shaped by the transformative potential of artificial intelligence (AI) (Codini et al., 2023; Miller, 2018). This introductory exposition delves into the evolutionary trajectory of AI within the realm of emerging business paradigms, elucidating its foundational concepts and its burgeoning influence in identifying emerging market opportunities and trends. As AI increasingly permeates diverse industries (Dwivedi et al., 2021), its integration is of paramount importance not only to expand organizational adaptability, but also to generate strategic synergy between technological advances and business innovation. This exploration attempts to navigate the dynamic landscape in which the evolution of AI converges with the propulsive contours of new business possibilities, highlighting the intricate interplay between technological augmentation and potential business horizons.

AI is composed of a very broad technology, making it very difficult to provide a concrete definition. Therefore, many considerations arise, one of the most common being the idea that AI is based on the simulation, by computers, of human behavior. This makes it possible to train machines to acquire skills related to decision making, judgment and emulation of human behavior (Da Xu et al., 2021). Within the field of AI, we find a wide range, from specialized AI, which focuses on the execution of specific and limited tasks, to general AI, which aims to match human ability to solve a variety of problems (D. Zhang, 2023).

AI is used in various fields, such as economic, social and healthcare (Iqbal et al., 2016) and its operation is based on the application of different techniques. As a specific approach within the field of AI, it is worth mentioning machine learning provides the machine with the ability to learn (Bishop & Nasrabadi, 2006).Cognitive ability is introduced in organizations to take decisions that increase productivity and help HR with employee retention (Shrestha et al., 2021) based on data analysis looking for patterns that allow the modification of employee behavior. We also find deep learning (Heaton, 2018) which is framed within machine learning and which uses machine learning algorithms inspired by the neurons of the human brain surpassing human capabilities (Silver et al., 2018). However, these benefits also come at a price, as there are several challenges to overcome to successfully implement analytical models in real business environments. These include the appropriate choice between multiple implementation options, bias and drift in data, mitigation of black-box properties, and reuse of preconfigured (as-a-service) models (Janiesch et al., 2021).

Based on the above definitions, we can see how, within companies, those responsible for ICT and data analysis seek to use AI to provide solutions to business problems that companies face daily, but also to seek higher returns from lower costs (Othman et al., 2016) arising in day-to-day business. The fact that AI can automate tasks (Hofmann et al., 2020; Siderska, 2020; Sobczak, 2022) that were previously performed by a series of workers or analyze the data generated by companies in the development of their activities and being able to optimize processes (Aguirre &

Rodriguez, 2017) and generate knowledge makes it an essential tool for the subsistence of the company (Fink et al., 2021).

2 AI Applied to Business Development

Foundations of AI have become key principles for the development and adaptation of enterprises to the changing environment. This exposition embarks on a comprehensive analysis of the rudimentary principles underlying the symbiotic relationship between AI and the development of new enterprises. Delving into the basic concepts of AI as applied to the business domain, this chapter allows one to consider how different cognitive AI paradigms contribute synergistically to the identification, evaluation, and exploitation of market prospects, thereby strengthening the strategic acumen of firms in an era characterized by rapid technological evolution and transformative economic change.

As a discipline of computer science, AI focuses on the creation of systems capable of performing tasks that normally require human intelligence (Miller, 2018). Its application in business has gained great momentum in recent years, transforming the way in which various aspects of management and decision-making are addressed. In the globalized environment, there is a multitude of data available, which, with correct extraction and processing allow organizations to be assisted in their strategic management. This technique is known as data mining, which involves the discovery and extraction of hidden patterns and relationships in massive data sets (Gutiérrez & Molina, 2016). Thus, with the help of AI techniques, companies can identify market trends, customer segments, and growth opportunities that might otherwise go unnoticed. Thus, AI provides evidence-based data analysis, which improves decision-making (Yarlagadda, 2018) and helps optimize complex business processes by analyzing multiple variables and finding optimal solutions (Chi-Hsien & Nagasawa, 2019). Therefore, as technology continues to evolve, the strategic integration of AI can provide significant competitive advantages (Wilson & Daugherty, 2018) in the business world.

The functions of AI have been widely considered by a multitude of researchers (Caner & Bhatti, 2020; Enholm et al., 2022). Within AI, deep learning should be highlighted, which refers to the study of AI algorithms that use multiple processing layers to learn and extract features from data, allowing them to understand more complex concepts and patterns in information analysis and classification applications (Deng & Yu, 2014). The use of AI algorithms as well as machine learning (ML) have been applied in most economic sectors. ML seeks to teach how machines should manage data more efficiently by simulating human learning and certain algorithms can be implemented for such learning. Machine learning algorithms can be used to perform predictive analytics, identify patterns, and make informed decisions based on historical data (Jiang et al., 2017). Natural language processing (NLP) is known as another major area within AI, which focuses on enabling machines to understand, interpret and generate human language naturally (C. Zhang

et al., 2020). In the business context, NLP is used to analyze customer feedback, automate online responses, and extract valuable information from large volumes of text.

3 Open Culture for Innovation and Technology

A corporate culture that fosters innovation and technology adoption is not only essential to keep up with rapid changes in the business environment, but also to seize new opportunities and generate significant competitive advantages. In the current era, a company's ability to embrace innovation and technology largely helps define its success.

Today, in a business context characterized by rapid technological evolution and disruptive changes in markets, the importance of fostering a business culture that embraces innovation (Bokrantz et al., 2017) and technology is highlighted. This approach is critical to ensure the success and sustainability of organizations. Those companies with a culture open to innovation and technology can adjust with agility to these changes, maintaining their relevance and competitiveness (see Fig. 1). In addition, an innovation and technology-oriented culture enables companies to identify previously unnoticed business opportunities. Consequently, it allows synergy between the different parts of the organization, giving rise to collaborative work and management spaces. In that sense, the adoption of new technologies, as experts

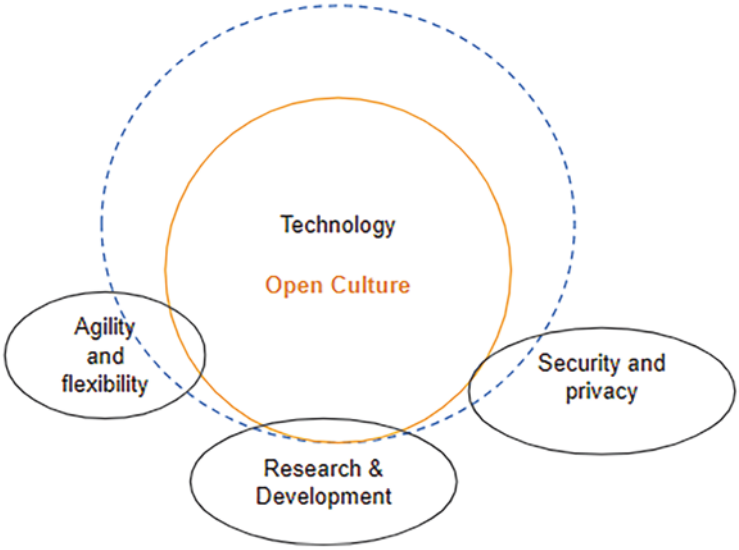

Fig. 1 Digital synergy

have pointed out (Akter et al., 2022), can open the door to new business models and market niches, driving business growth.

In business culture, the interrelationship shown between the different elements is critical to success. An open culture in technology (Leal-Rodríguez et al., 2023) will foster innovation and collaboration, while both agility and flexibility will allow it to adapt to technological changes. The fact that organizations maintain high budgets generates an investment in research and development that will foster a learning environment, developing the organizations' teams, and above all, cultivating a culture that supports this profound process of change by seeking to keep abreast of all technologies (Kane, 2019). We must keep in mind that both security (Cardholm, 2016) and privacy (Scarpi et al., 2022) are key to the ethical use of technology.

Considering the changing environment, to compete in it, one needs to adapt to technological and innovation trends, which is achieved through a culture open to innovation (Monostori et al., 2016). Therefore, as shown in Fig. 1, technology, in addition to contributing to improve operational efficiency, automating processes, optimizing operations, and reducing costs (Zheng et al., 2018), allows agility and flexibility in the organization, generates continuous R&D paths, and provides security in the treatment of information.

4 Implementation of Digital Transformation Strategies for AI Adoption

Digital transformation has become a strategic necessity for companies that want to stay competitive and relevant in today's business landscape. Effective AI adoption can make the difference between a laggard and an innovation leader.

Successful adoption of AI in an organization involves several fundamental steps which can be summarized in a strategic process. First, a thorough assessment of the company's current situation must be conducted (Legner et al., 2017), understanding its technological position, organizational culture, processes, and digital skills. This provides the basis for identifying areas of opportunity where AI can generate the greatest impact (Reim et al., 2020). Once the current situation is understood, clear and measurable objectives should be set that are aligned with the company's strategic vision. These objectives should be realistic in terms of time and available resources.

To accomplish this transformation, the formation of a multidisciplinary team is required, involving professionals from diverse areas (Sharma & Sharma, 2019), including technology, business, marketing, and human resources. Interdepartmental collaboration and a holistic approach are essential for successful AI adoption (Albukhitan, 2020). Talent acquisition and staff training in AI are crucial steps, either through hiring experts or in-house training (Nadeem et al., 2018). In addition, the company's technology infrastructure (Akerkar, 2019) must be assessed and upgraded (Akerkar, 2019) to support AI solutions, which may include the adoption