Artículos

Governance and compliance recommendations for Artificial Intelligence in Business Management

Recomendaciones de gobernanza y cumplimiento para la inteligencia artificial en la gestión empresarial

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Recepción: 07 Julio 2024 Aprobación: 11 Noviembre 2024 Publicación: 19 Noviembre 2024 Abstract: The research problem of this article is the following: what are the possible legal issues regarding the use of Artificial Intelligence in business management, and how can they be solved? The integrated research, the bibliographic research technique, and the Boolean technique are used in this work. The database used was Google Scholar. The search terms were "Artificial Intelligence" + "management" + "review" and "Artificial Intelligence" + "Organizations" + "review". The justification for limiting the search to the term "review" lies in the extensive and qualified bibliography of integrated reviews. The articles were selected based on the following criteria: a) open-source availability; b) simultaneous combination of search terms; c) thematic articles on business management; and d) chronology (after 2020). As a result, the main areas for the use of AI in business management are innovation; supply chain management; decisionmaking; human resources; strategic management; and product management. Furthermore, the possible legal issues that can be faced are lack of accountability; biased decisions; discrimination; non-compliance with digital literacy; violation of privacy; and unfair decisions. Finally, the original contributions of this work are 12 Governance recommendations and 8 Compliance recommendations.

Keywords: Compliance, Business Management, Artificial Intelligence, Recommendations.

Resumen: El problema de investigación de este artículo es el siguiente: ¿cuáles son los posibles problemas jurídicos relacionados con el uso de la inteligencia artificial en la gestión empresarial y cómo pueden resolverse? En este trabajo se utilizan la investigación integrada, la técnica de investigación bibliográfica y la técnica booleana. La base de datos utilizada fue Google Scholar. Los términos de búsqueda fueron "Artificial Intelligence" + "management" + "review" e "Artificial Intelligence" + "Organizations" + "review". La justificación para limitar la búsqueda al término review radica en la extensa y cualificada bibliografía de revisiones integradas. La selección de los artículos se basó en los siguientes criterios: a) disponibilidad en código abierto; b) combinación simultánea de los términos de búsqueda; c) artículos temáticos sobre gestión empresarial; y d) cronología (posterior a 2020). Como resultado, las principales áreas para el uso de la IA en la gestión empresarial son la innovación; la gestión de la cadena de suministro; la toma de decisiones; los recursos humanos; la gestión estratégica; y la gestión de productos. Además, los posibles problemas legales a los que se puede enfrentar son la falta de responsabilidad; las decisiones sesgadas; la discriminación; el incumplimiento de la alfabetización digital; la violación de la privacidad; y las decisiones injustas. Por último, las aportaciones originales de este trabajo son 12 recomendaciones de gobernanza y 8 de cumplimiento.



Palabras clave: cumplimiento, gestión empresarial, inteligencia artificial, recomendaciones..



1. Introduction

Artificial Intelligence (AI) can be understood as the "study of agents that receive percepts from the environment and perform actions" (Russell & Norvig, 2016). There are many legal and ethical discussions about AI personality and its condition as an Agent of Law (Pagallo, 2018; Santos Divino, 2021); for this essay, AI is a tool used to improve and perform actions. AI can be used in different sectors of the economy (Furman & Seamans, 2019).

The importance of this technology is linked to the development of computers capable of transforming the society. At this point, the Law is an actor aiming to verifying how this integration of these means can be achieved without harming individuals. To date, recommendations and ethical guidelines that resemble soft law are being drawn up to set parameters and tackle the issues that AI presents.

From this background, this essay seeks to answer the following research questions: RQ1: What are the possible legal issues in the use of AI in Business Management? RQ2: How to solve these challenges using Compliance and Governance?

First, the legal treatment of this issue should begin with an analysis of the factual aspects in which the use of these technological tools is most prevalent. Subsequently, it becomes possible to intervene without illegitimately suppressing the public sphere in the private sphere. In essence, it is a question of being able to exercise and reconcile the practicality and ease of the information society with the protection of the subjects of law.

The first section describes the methodology used for this study. The method used is integrated research associated with the bibliographic research technique and the Boolean technique. Google Scholar was used as the database. The search terms were "Artificial Intelligence" + "management" + "review" and "Artificial Intelligence" + "Organizations" + "review". The justification for limiting the search to the term "review" lies in the extensive and qualified bibliography of integrated reviews. The articles were selected based on the following criteria: a) open-source availability; b) simultaneous combination of search terms; c) thematic articles on business management; and d) chronology (after 2020).

The second section presents two results: the first relates to the articles selected according to methodological standards; the second relates to the Potential areas (PA) of application of AI and Possible Legal Issues (PLI). Finally, the third section presents 12 Governance and 8 compliance recommendations for Artificial Intelligence in Business Management.

2. Research Methodology



The methodology used in this essay is sustained by Higgins and Green (2008) proposal in his Cochrane Handbook for Systematic Reviews of Intervention. In this protocol, at least five steps must be followed: I) Selection of bibliometric databases; II) Defining Strings; III) Inclusion and exclusion criteria; IV) Identification of research gaps and future research directions; and V) Quality Assessment.

2.1. Selection of bibliometric databases

The search terms were then applied in the search engine Google Scholar (GS). We know the GS limitations (Falagas et al., 2008),\(^2\) especially regarding grey literature.\(^4\) However, this is a free platform, and the author does not have full access to Scopus or Web of Science. This is a research gap that we tried to solve by improving the inclusion and exclusion criteria and the quality assessment of the selected essays.

2.2. Defining Strings

This essay was made for a Call for Papers on Artificial Intelligence and Organizational Management. The strings used aimed to answer the RQ1 and RQ2 according to the call proposal are: Artificial Intelligence and Organizations. However, the author's contribution relies on governance and compliance proposals. So, we use "management" as a third string, and the Boolean Method (Sampson et al., 2008) in the Search Engine.

 Table 1

 Final Strings considering the search process strategy

Scientific database	Search strings	
Scholar	"Artificial Intelligence" AND "management" AND "review" OR "Artificial Intelligence" AND "Organizations" AND "review".	

2.3. Inclusion and exclusion criteria

The selected articles have fulfilled the following inclusion criteria: I) Only articles that correctly and simultaneously match with the three strings; II) originally available in open access; III) published after 2020; IV) and review essay. The 3rd inclusion criterion was proposed to set a timeline according to Transformer-based language models (TLMs) (Bouschery et al., 2023). This Artificial Intelligence language model has "widely been recognized to be a cutting-edge technology for the successful development of deep-learning-based solutions to problems and applications that require natural language processing and understanding" (Greco & Tagarell 2023). The fourth criterion is used because of the extensive and qualified review



bibliography on the subject of analysis. It is not the aim of this article to carry out a systematic review of the essays already published in the field of Artificial Intelligence and Business Management. Therefore, it is understood that there is no need for new reviews, as the works already published are sufficient to answer RQ1 and RQ2.

Despite meeting all the inclusion criteria, some papers were excluded, of which: I) were not in the field of management or business administration (Patel et al., 2023); II) were classified as grey literature; III) were found and located beyond page 10 of the search engine; and IV) were not peer-reviewed.

2.4. Identification of research gaps and future research directions

The research has the following limitations and gaps:

- I) By using Google Scholar, thematic papers that would have fit the inclusion criteria may not have been selected. Accuracy is a problem with this search engine (García-Pérez, 2010).
- II) As the papers were selected by combining the three strings, thematic articles that could contribute to the area and to the development of the subject were excluded.
 - III) The results found are limited to Business Management.
- IV) The original contributions and proposals are based on the inductive method and, therefore, may be the author's monocular vision. However, this does not detract from the merit of the indications, which are possibly useful due to the author's background and expertise.
- V) The reflections and contributions of governance and compliance can allow the manager of an organization to adopt preventive and adequate conduct for the use of AI in his company. In this way, violations of the rights of the people involved can be avoided.

2.5. Quality Assessment

The author reviewed the selected articles to identify: I) the quality of the writing; II) the logic of the reasoning and premises proposed; III) methodological rigor; IV) relevant discussions; and V) problems and practical applications. It should be noted that although the number of citations is not a factor directly linked to the quality of the article (Aksnes et al., 2019), it was also considered, but not as a factor of exclusion, but of relevance to the analysis.

3. Results

After the methodological selection procedure, 16 articles were selected.





 Table 2

 Summary of the categorisation of the literature

Field	Tittle	Author(s)
Innovation, and management	Artificial intelligence and innovation management: A review, framework, and research agenda	(Haefner et al., 2021)
Supply Chain Management	Artificial intelligence in supply chain management: A systematic literature review	(Toorajipour et al., 2021)
Decision- making	A solution looking for problems? A systematic literature review of the rationalizing influence of artificial intelligence on decision-making in innovation management	(Pietronudo et al., 2022)
Innovation, and management	The implementation of artificial intelligence in organizations: A systematic literature review	(Lee et al., 2023)
Human Resources	Artificial Intelligence in Tactical Human Resource Management: A Systematic Literature Review	(Votto et al., 2021)
Innovation, and management	Artificial intelligence in organizations: New opportunities for phenomenon-based theorizing	(Von Krogh, 2018)
Innovation, and management	Artificial Intelligence Enabled Project Management: A Systematic Literature Review	(Taboada et al., 2023)
Innovation, Human Resources, and management	Artificial intelligence, robotics, advanced technologies, and human resource management: a systematic review	(Vrontis et al., 2021)
Human Resources	Artificial intelligence in human resources management: A review and research agenda	(Gélinas et al., 2022)
Innovation, and management	A multilevel review of artificial intelligence in organizations: Implications for organizational behavior research and practice.	(Bankins et al., 2024)
Management	The impact of artificial intelligence and information technologies on the efficiency of knowledge management at modern organizations: a systematic review	(Al Mansoori et al., 2020)



Management	Understanding artificial intelligence adoption in operations management: insights from the review of academic literature and social media discussions	(Grover et al., 2022)
Innovation, and management	Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of AI applications.	(Gama & Magistretti, 2023)
Product Management	Artificial Intelligence in Product Management: Systematic review.	(Namatherdhala et al., 2022)
Supply Chain Management (SCM)	Future of artificial intelligence and its influence on supply chain risk management—A systematic review	(Ganesh & Kalpana, 2022)
Strategic management	Understanding the interplay of artificial intelligence and strategic management: four decades of research in review	(Keding, 2021)

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After carefully reading each article, the common areas and possible legal issues directly associated with Business Management are defined. The method used to define each problem was the inductive method and the author's experience report. Therefore, based on the professional background, we can infer possible situations that could give rise to one or more legal issues. It is important to emphasize the term "possible". Therefore, it is not a statement that the crime will occur. It is a hypothetical allegation aimed at the adoption of preventive practices and the duty of caution.



Table 3 Summary of the possible legal issues on Artificial Intelligence Business Management

Field

Potential areas (PA) and Possible Legal Issues (PLI)

PA1-3 (Haefner et al., 2021) PA1: Overcoming information processing constraints with AI to develop ideas. PLI1: As the AI applications can be used to identify treatments for disease, the PLI is processing Biometric data without explicit owner's consent (Johansen & Quon, 2018). PA2: Overcoming information processing constraints with AI to generate ideas. PLI2: Tshitoyan et al. (2019) created an AI capable of capturing latent knowledge from the materials science literature. The PLI is a copyright violation (Abbott & Rothman, 2023). PA3: Overcoming local search routines with AI to develop and generate ideas. PLI3: AI like DesIGN (Sbai et al., 2018) and the creative adversarial network (CAN) (Elgammal, 2017) might use copyrighted material to generate novel styles, forms, and shapes for fashion apparel and violate copyright (Abbott & Rothman, 2023). PA4-6 (Lee et al., 2023) PA4: Organization Knowledge - Lack of knowledge about the timing, technology, data, capabilities, and level of usage PLI4: Violation of digital literacy (Gilster, 1997) PA5: Ethical & Legal PLI5: Ethical and legal constraints; Privacy issues; Bias; Fairness violation; Lack of Confidentiality; Security Risk; Lack of audit tools and standards or guidelines. PA6: Technological limitations PLI6: A black-box AI model can cause serious privacy violations. PA7-8 (Von Krogh, 2018) PA7: Substituting a human-labor force through AI. PLI7: There is not an evident legal issue about this situation. PA8: Undesirable consequences of biases in automated decision-making PLI8: Discrimination (Heinrichs, 2022) PA9-10 (Taboada et al., 2023) PA9: Classify stakeholders using two ML clustering algorithms. PL9: Bias and discrimination based on its financial score (Zarsky, 2014). PA10: AI-based uncertainty performance domains (PD) PL10: Safety issues in construction and violation of labor law (Veiga & Cadete Pires, 2018). PA11 (Bankins et al., 2024) PA11: Human-AI collaboration PLI11: Violation of digital literacy (Gilster, 1997). PA12-15 (Gama & Magistretti, 2023) PA12: Functional competence - AI adoption requires new capabilities. PLI12: Violation of digital literacy (Gilster, 1997) PA13: Cybersecurity management PLI13: Secure data-sharing in real-time, protect access rights, intrusion detection, and data integrity for public and private organizations (Brock & Von Wangenheim, 2019). PA14: Screening the regulations. PLI14: Violation of fairness (Hacker, 2018), accountability (Katyal, 2019), and transparency (Felzmann et al., 2020) PA15: Ethical implications. PLI15: Organization learning myopia and automation complacency (Raisch & Krakowski, 2021).

Innovation, and management



Decisionmaking

PA16-17 (Pietronudo et al., 2022) PA16: AI sped up the decision process in identifying, prototyping, and testing novel solutions in different business environments. PLI16: There is not an evident legal issue about this situation. PL17: AI improves the ability to manage product development activities and decisions fostering collaboration across organizational functions, business units, and between organizations. PLI17: Biased decisions (Ntoutsi et al., 2020); lack of transparency (Schmidt et al., 2020); lack of accountability (Busuioc, 2021).

Innovation and Human

Resources

PA18-19 (Vrontis et al., 2021). PA18: AI in the context of job replacement PLI18: There is not an evident legal issue about this situation. PA19: AI in the context of human-AI collaboration, training, decision-making, and recruiting. PLI19: Biased decisions (Ntoutsi et al., 2020); lack of transparency (Schmidt et al., 2020); lack of accountability (Busuioc, 2021); Violation of digital literacy (Gilster, 1997). PA20 (Votto et al., 2021) PA20: AI use in Human Resource Information Systems (HRIS) PLI20.1: Provide performance feedback to employees by tracking employee behavior at work – Privacy Violation (Moussa, 2015). PLI20.2: Assess Employee Productivity - There is not an evident legal issue about this situation. PLI20.3: Automate performance evaluations - Lack of transparency (Krishnamoorthi & Raphael, 2022). PLI20.4: Generate Personalized Recommendations for Job Improvement – Privacy violation (Kaaniche et al., 2020) PLI20.5: Identifying employees who are at risk for leaving – There is not an evident legal issue about this situation. PLI20.6: Identifying when an employee applies him/herself physically, cognitively, and emotionally toward their work - Privacy and intimacy violation (Hughes et al., 2019) PL20.7: Fielding harassment claims – Lack of Cybersecurity, privacy, and intimacy, so data breach. PL20.8: Regulation of the employment relationship through active intervention in disputes between employers and managers – Unfair decision-making, and lack of transparency (Ferrara, 2023). PL20.9: Enforce disciplinary rules consistently - Unfair decision-making.

SCM, Product and Resources Management PA21(Toorajipour et al., 2021) PA21: Marketing PLI21.1: Pricing – Wrong pricing and consumer enforcement (Seele et al., 2021) PLI21.2: Segmentation – Consumer discrimination (Gerlick & Liozu, 2020) PA22 (Namatherdhala et al., 2022) PA22: Marketing and ads PLI22: Privacy issues and abusive advertising (Chuan et al., 2023) PA23 (Ganesh & Kalpana, 2022) PA23: Information risks PLI23.1: Cyber threats (Rajagopal et al., 2017). PLI23.2: Intellectual property breach (Rajagopal et al., 2017). PLI23.3: Data management risks (Rajagopal et al., 2017). PA24 (Grover et al., 2022) PA24: Selecting appropriate data sources. PLI: Ethical and privacy violation PA25 (Keding, 2021) PA25: Trust and acceptance PLI25: There is not an evident legal issue about this situation. PA26: Content creation PLI26: Copyright violation (Abbott & Rothman, 2023).

Based on the Possible Legal Issues (PLI) detected, the author will present his contributions through Governance (GR) and Compliance (CR) recommendations.



4. Discussions and recommendations

Governance is management practices. Compliance is the adaptation of practices to the law. Three observations should be made. First, is that not all GRs are classified as CR, as they may not be associated with a regulatory guideline. Second, is that there are PLIs that are verified in the same way in different APs. Therefore, they will be treated as one. Third, is that Table 3 shows that some PLIs can be split up, as they have different objects of legal protection. Therefore, the PLIs listed here will not correspond correctly to the PLIs in Table 3.

Furthermore, it is important to note that the recommendations will be based on the Control Objectives for Information and Related Technologies (COBIT), an IT governance and management framework that offers guidelines for strategic alignment, value delivery, risk management, and optimization of IT resources (Pereira & Ferreira 2015). Finally, as each economic management system is unique, aiming to reach the greatest number of companies, the recommendations are more generic and possibly suitable for any kind of business.

PLI1: Lack of Confidentiality and Privacy issues.

Privacy issues can originate from human actions (data leaks) or computer actions (data erasing). Regardless of the origin, in the Brazilian legal system, companies should already be compliant with the General Data Protection Regulation since September 2020. If the company under analysis or the object of management is not compliant, it is strongly recommended that it comply with the GDPR (CR1). The purpose of this guideline is to avoid fines for noncompliance. For this to happen, it is essential to define (CR2): 1) what type of economic activity will be carried out, to define the legal basis for data processing, as well as the respective purposes; 2) what data will be collected (including in order not to collect sensitive -biometric- data without the respective observance of the need and the legal basis); 3) why this data will be collected; 4) what the purposes of this data are; 5) who the holders of this data are; 6) what the mechanisms and methods of access to this data by the holder will be based on the creation of logical management software (COBIT DSS05. 04); 7) how to respond to the data subject's request; 8) the preparation of the Data Protection Impact Assessment (DPIA). It is understood that the absence of a GDPR compliance program is a priority action and the necessary allocation of resources (COBIT APO06.02).

However, adopting an adequacy system is not enough. The manager needs to allocate ongoing resources so that data protection is constantly updated and, whenever possible, adequate against any type of external interference (COBIT APO06.03 and COBIT DSS05.01).



This review allows the manager to align, plan, and organize the COBIT domain based on more appropriate and efficient responses to the demands that arise, such as changes in managed service contracts (COBIT APO09); improving managed quality (COBIT APO10); reducing and mitigating managed risk (COBIT APO11); and having a better-managed data system (COBIT APO14) (CR3 and GR1).

Through constant monitoring practices, it will be possible to identify whether external compliance requirements are being met (COBIT MEA03.01) (GR2). The standard for analysis in this case will be the GDPR. However, this is not the only challenge. There are also possible copyright violations from the use of AI in Business Administration.

PLI2: Intellectual property breach and violation.

The first legal issue is copyright infringement. You should adopt a database where copyright has been correctly collected or does not exist (copyleft) (GR2). In other words, the data entered is free and has no restrictions on use. However, it is always important for the manager to assess the origin of this database to avoid copyright infringement, especially concerning the image of the owners and musical, literary, and visual works (CR4 and GR3).

Even if an incident involving copyright infringement occurs, the company must have a response system in place to quickly take down the content. This speed and agility can be acquired through an organizational change (COBIT BAI05) and the implementation of a managed and monitored process (COBIT MEA01 and 02) for this purpose (COBIT BAI11). The need for this is justified by the fact that the Brazilian Civil Rights Framework for the Internet adopts the notice and takedown system (art. 19, §3) in this area. Therefore, to avoid aggravating legal claims, it is highly recommended to establish a sector so that responses to these problems are quick and effective (CR5 and GR4).

To prevent security incidents, it is recommended to establish vulnerability management and monitoring software for the entire data infrastructure (COBIT DSS05.07) (GR5). The following should be established: an adequate level of access terminal security (COBIT DSS05.03); ensuring that a restricted number of users have access to the database (DSS05.04) and that these users only access it with justification; and establishing a mechanism for detecting and managing documents and output devices to locate when and where possible violations arising from human error have occurred (COBIT DSS05.06).

These shortcomings can, in a way, be mitigated by properly training the company's employees. Although the National Digital Education Policy (Bill 14.533/2023) is aimed at public administration, it establishes guidelines for digital training and specialization (art. 4) that are fully applicable to the private sector.

PLI3: Violation of digital literacy.



Digital Literacy is nothing more than the competence and skill that human beings possess in dealing with technology. It means knowing how it works and understanding its limits. Digital literacy empowers human beings and, in a way, includes them in a computerized society. It is a skill that is constantly required in the selection processes of companies operating in the technology sector. If a company intends to adopt AI resources in its management aspects, it is worth creating, maintaining (COBIT APO06.03), and prioritizing the allocation of resources (COBIT APO06.02) for adequate employee training (GR6). Here's a note: as digital literacy is linked to the performance of the job, if the employee needs to train during working hours, the time spent should be counted towards their hours worked (CR6). This is the understanding of the current Superior Labor Court. In addition to being a humanistic practice, an employee who is suitable for the job can train himself to perform his job better. However, if the company finds that it is not appropriate to proceed with the training, it is recommended (GR7) to analyze the costs of dismissal compared to hiring an already trained employee (CR7). This option is recommended when the costs of the former outweigh those of the new hire or cannot be implemented due to a limitation in the intellectual capacity of the employee to be trained (GR8) (COBIT BAI04).

PLI4: Fairness violation, Biased decisions, and discrimination.

PLIs involving biased decisions and discrimination can be resolved using the following recommendations (GR9) (COBIT DSS03): 1) prior verification of the database; 2) not making decisions solely and exclusively on the score of the client/data owner; 3) using AI programmed with ethical guidelines and that do not perform discriminatory acts; and 4) constantly analyzing and reviewing (every six months - COBIT DSS04) the databases to avoid the implementation of biases and that the information is relevant, current, validated and reliable for knowledge and management for business decisions.

PLI5: Lack of audit tools and standards or guidelines, Cyber threats, and Security Risk.

As mentioned above, security threats and incidents can be of human or computer origin. To avoid both, it is highly recommended to adopt layered protections against malicious software (COBIT DSS05.01) (GR10). It is suggested that, whenever possible, the Linux system should be used, given its low propensity to malware (Carrillo-Mondéjar et al., 2020). However, as tools are constantly being developed for this purpose, it is essential to constantly manage network security and connectivity (COBIT DSS05.02). This is a practice designed to minimize the impact of digital vulnerabilities and security incidents on corporate business (GR11).

For companies that don't have verification tools and compliance policies, this is an urgent need. Therefore, those responsible should be



integrated based on their expertise, functions, and positions, to work as a team. Based on this integration, the main areas of risk should be detected. The team will be responsible for the innovative development of the AI tool within this risk area. It is extremely important to constantly review and evaluate it, as it must be auditable if third parties request reviews or even explanations about automated decision-making (according to Art. 20 of the GDPR) (CR8).

This whole process involves creating a culture that involves collaboration, data management, agility, digital awareness, and business awareness. It is not recommended (GR12) to completely delegate this service or task to third parties since internal employees have considerable value due to their experience over the years in the organization.

Note that although the focus is on AI, the beginning and maintenance of the entire management process is centered on humans. AI has the function of optimizing processes. But human participation still seems indispensable in the face of AI's inexperience or limitations. Another point worth highlighting is the limitations of the research. As the CRs and GRs are generic and the business areas are specific, it is believed that one or the other may not be suitable for the business under analysis. However, it is believed that the recommendations are, to a certain extent, sufficient to remedy most of the PLIs listed and make a considerable contribution to a sensitive subject that needs to be addressed.

5. Conclusions

The research problem of this article was: what are the possible legal issues regarding the use of Artificial Intelligence in business management, and how can they be solved? As a result, the main areas for the use of AI in business management are innovation; supply chain management; decision-making; human resources; strategic management; and product management. Furthermore, the possible legal issues that can be faced are lack of accountability; biased decisions; discrimination; non-compliance with digital literacy; violation of privacy; and unfair decisions. Finally, the original contributions of this work are 12 Governance recommendations and 8 Compliance recommendations.

All the contributions used the COBIT guidelines. This is an important business management tool involving information technology. The limitations of the research lie in the impossibility of covering all areas of business management. However, the research makes progress in the area of information security involving the use of AI in the private sector. Strategies are presented based on the strengths and interactions between internal and external agents so that they can collaborate in pursuit of a common goal: legal compliance, profits, and management optimization. In addition, the



research shows that it is important, and perhaps essential, to understand and define the risk contexts that entrepreneurs need to be aware of. Only in this way will it be possible to infer actions and propose management practices to reduce the consequences and impacts of the use of AI in their management. This whole process involves a comprehensive acceptance of the limited knowledge we have about the use of AI.

Given the above, it can be seen that the integration of AI into organizational headquarters, whether to reshape workflow, strategic practices, or market tactics, runs up against legal issues associated with privacy, trust, transparency, biases, regulation, and, above all, human connections. AI should not be thought of as a substitute for human beings but as a necessary tool for achieving effectiveness and efficiency.

It is hoped that the contributions of this research will be used as avenues for further practical work that will provide answers about how it works. Based on these results, we will be able to broaden our horizons and develop strategies that are better suited to protecting rights and making the market more efficient.



References

- Abbott, R., & Rothman, E. (2023). Disrupting creativity: Copyright law in the age of generative artificial intelligence. *Florida Law Review*, 75(6), 1141. https://www.floridalawreview.com/article/91299-disrupting-creativity-copyright-law-in-the-age-of-generative-artificial-intelligence
- Al Mansoori, S., Salloum, S. A., & Shaalan, K. (2020). The impact of artificial intelligence and information technologies on the efficiency of knowledge management at modern organizations: a systematic review. In M. Al-Emran, K. Shaalan, & A. E. Hassanien (eds.), *Recent advances in intelligent systems and smart applications* (pp. 163-182). Springer.
- Aksnes, D. W., Langfeldt, L., & Wouters, P. (2019). Citations, citation indicators, and research quality: An overview of basic concepts and theories. *Sage Open*, 9(1), 2158244019829575. https://doi.org/10.1177/2158244019829575
- Bankins, S., Ocampo, A. C., Marrone, M., Restubog, S. L. D., & Woo, S. E. (2024). A multilevel review of artificial intelligence in organizations: Implications for organizational behavior research and practice. *Journal of Organizational Behavior*, 45(2), 159-182. https://doi.org/10.1002/job.2735
- Bouschery, S. G., Blazevic, V., & Piller, F. T. (2023). Augmenting human innovation teams with artificial intelligence: Exploring transformer-based language models. *Journal of Product Innovation Management*, 40(2), 139-153. https://doi.org/10.1111/jpim.12656
- Brock, J. K. U., & Von Wangenheim, F. (2019). Demystifying AI: What digital transformation leaders can teach you about realistic artificial intelligence. *California Management Review*, 61(4), 110-134. https://doi.org/10.1177/1536504219865226
- Busuioc, M. (2021). Accountable artificial intelligence: Holding algorithms to account. *Public Administration Review*, 81(5), 825-836. https://doi.org/10.1111/puar.13293
- Carrillo-Mondéjar, J., Martínez, J. L., & Suarez-Tangil, G. (2020). Characterizing Linux-based malware: Findings and recent trends. *Future Generation Computer Systems*, 110, 267-281. https://doi.org/10.1016/j.future.2020.04.031
- Chuan, C. H., Tsai, W. H. S., & Yang, J. (2023). Artificial Intelligence, Advertising, and Society. *Advertising & Society Quarterly*, 24(3). https://dx.doi.org/10.1353/asr.2023.a911198



- Elgammal, A., Liu, B., Elhoseiny, M., & Mazzone, M. (2017). Can: Creative adversarial networks, generating" art" by learning about styles and deviating from style norms. International Conference on ComputationalCreativity (ICCC), Atlanta, GA, June 20th-June 22nd, 2017. https://ar5iv.labs.arxiv.org/html/1706.07068.
- Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, web of science, and Google scholar: strengths and weaknesses. *The FASEB Journal*, 22(2), 338-342. https://doi.org/10.1096/fj.07-9492LSF
- Felzmann, H., Fosch-Villaronga, E., Lutz, C., & Tamò-Larrieux, A. (2020). Towards transparency by design for artificial intelligence. *Science and Engineering Ethics*, 26(6), 3333-3361. https://doi.org/10.1007/s11948-020-00276-4
- Ferrara, E. (2023). Fairness and bias in artificial intelligence: A brief survey of sources, impacts, and mitigation strategies. *Sci*, 6(1), 3. https://doi.org/10.3390/sci6010003
- Furman, J., & Seamans, R. (2019). AI and the Economy. *Innovation policy* and the economy, 19(1), 161-191. https://www.journals.uchicago.edu/doi/10.1086/699936
- Gama, F., & Magistretti, S. (2023). Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of AI applications. *Journal of Product Innovation Management*, 1-36. https://doi.org/10.1111/jpim.12698
- Ganesh, A. D., & Kalpana, P. (2022). Future of artificial intelligence and its influence on supply chain risk management–A systematic review. *Computers & Industrial Engineering, 169*, 108206. https://doi.org/10.1016/j.cie.2022.108206
- García-Pérez, M. A. (2010). Accuracy and completeness of publication and citation records in the Web of Science, PsycINFO, and Google Scholar: A case study for the computation of h indices in Psychology. *Journal of the American society for information science and technology*, 61(10), 2070-2085. https://doi.org/10.1002/asi.21372
- Gélinas, D., Sadreddin, A., & Vahidov, R. (2022). Artificial intelligence in human resources management: A review and research agenda. *Pacific Asia Journal of the Association for Information Systems*, 14(6), 1. https://aisel.aisnet.org/pajais/vol14/iss6/1/
- Gerlick, J. A., & Liozu, S. M. (2020). Ethical and legal considerations of artificial intelligence and algorithmic decision-making in personalized pricing. *Journal of Revenue and Pricing Management*, 19, 85-98. https://doi.org/10.1057/s41272-019-00225-2
- Gilster, P. (1997). Digital literacy. Wiley Computer Pub.



- Greco, C. M., & Tagarelli, A. (2023). Bringing order into the realm of Transformer-based language models for artificial intelligence and law. *Artificial Intelligence and Law*, 1-148. https://doi.org/10.48550/arXiv.2308.05502
- Grover, P., Kar, A. K., & Dwivedi, Y. K. (2022). Understanding artificial intelligence adoption in operations management: insights from the review of academic literature and social media discussions. *Annals of Operations Research*, 308(1), 177-213. https://doi.org/10.1007/s10479-020-03683-9
- Hacker, P. (2018). Teaching fairness to artificial intelligence: existing and novel strategies against algorithmic discrimination under EU law. *Common Market Law Review*, 55(4), 1143-1185. https://doi.org/10.54648/cola2018095
- Haddaway, N. R., Collins, A. M., Coughlin, D., & Kirk, S. (2015). The role of Google Scholar in evidence reviews and its applicability to grey literature searching. *PloS one*, *10*(9), e0138237. https://doi.org/10.1371/journal.pone.0138237
- Haefner, N., Wincent, J., Parida, V., & Gassmann, O. (2021). Artificial intelligence and innovation management: A review, framework, and research agenda A. *Technological Forecasting and Social Change, 162*, 120392. https://doi.org/10.1016/j.techfore.2020.120392
- Higgins, J. P., & Green, S. (2008). Cochrane handbook for systematic reviews of interventions version 5.0. 1. The Cochrane Collaboration.
- Heinrichs, B. (2022). Discrimination in the age of artificial intelligence. AI & Society, 37(1), 143-154. https://doi.org/10.1007/s00146-021-01192-2
- Hughes, C., Robert, L., Frady, K., & Arroyos, A. (2019). Artificial intelligence, employee engagement, fairness, and job outcomes. In *Managing technology and middle-and low-skilled employees* (pp. 61-68). Emerald Publishing Limited.
- Johansen, N., & Quon, G. (2019). scAlign: a tool for alignment, integration, and rare cell identification from scRNA-seq data. *Genome biology*, 20(1), 166. https://doi.org/10.1186/s13059-019-1766-4
- Kaaniche, N., Laurent, M., & Belguith, S. (2020). Privacy enhancing technologies for solving the privacy-personalization paradox: Taxonomy and survey. *Journal of Network and Computer Applications*, 171, 102807. https://doi.org/10.1016/j.jnca.2020.102807
- Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of



- artificial intelligence. Business Horizons, 62(1), 15-25. https:// doi.org/10.1016/j.bushor.2018.08.004
- Katyal, S. K. (2019). Private accountability in the age of artificial intelligence. UCLA Law Review, 66(54), 55-141. https://www.uclalawreview.org/ private-accountability-age-algorithm/
- Keding, C. (2021). Understanding the interplay of artificial intelligence and strategic management: four decades of research in review. Management Review Quarterly, 71(1), 91-134. https://doi.org/ 10.1007/s11301-020-00181-x
- Krishnamoorthi, S., & Raphael, B. (2022). A review of methodologies for performance evaluation of automated construction processes. Built Environment Project and Asset Management, 12(5), 719-737. https:// doi.org/10.1108/BEPAM-03-2021-0059
- Lee, M. C., Scheepers, H., Lui, A. K., & Ngai, E. W. (2023). The implementation of artificial intelligence in organizations: A systematic literature review. Information & Management, 60(5), 103816. https://doi.org/10.1016/j.im.2023.103816
- Moussa, M. (2015). Monitoring employee behavior through the use of technology and issues of employee privacy in America. Sage Open, 2158244015580168. https://doi.org/ 10.1177/2158244015580168
- Namatherdhala, B., Mazher, N., & Sriram, G. K. (2022). Artificial Intelligence in Product Management: Systematic InternationalResearch Journal of Modernization in Engineering Technology and Science, 4(7), 2914-2917.
- Ntoutsi, E., Fafalios, P., Gadiraju, U., Iosifidis, V., Nejdl, W., Vidal, M. E., ... & Staab, S. (2020). Bias in data-driven artificial intelligence systems -An introductory survey. Wires Data Mining and Knowledge *Discovery, 10*(3), e1356. https://doi.org/10.1002/widm.1356
- Pagallo, U. (2018). Vital, Sophia, and Co.—The quest for the legal personhood of robots. Information, 9(9), 230. https://doi.org/ 10.3390/info9090230
- Patel, A., Kethavath, A., Kushwaha, N. L., Naorem, A., Jagadale, M., Sheetal, K. R., & Renjith, P. S. (2023). Review of artificial intelligence and internet of things technologies in land and water management research during 1991-2021: A bibliometric analysis. Engineering Applications of Artificial Intelligence, 123, 106335. https://doi.org/ 10.1016/j.engappai.2023.106335
- Pereira, C., & Ferreira, C. (2015). Identificação de Práticas e Recursos de Gestão do Valor das TI no COBIT 5/Identification of IT Value



- Management Practices and Resources in COBIT 5. Revista Ibérica de Sistemas e Tecnologias de Informação, (15), 17.
- Pietronudo, M. C., Croidieu, G., & Schiavone, F. (2022). A solution looking for problems? A systematic literature review of the rationalizing influence of artificial intelligence on decision-making in innovation management. *Technological Forecasting and Social Change, 182*, 121828. https://doi.org/10.1016/j.techfore.2022.121828
- Raisch, S., & Krakowski, S. (2021). Artificial intelligence and management: The automation–augmentation paradox. *Academy of Management Review*, 46(1), 192-210. https://doi.org/10.5465/amr.2018.0072
- Rajagopal, V., Venkatesan, S. P., & Goh, M. (2017). Decision-making models for supply chain risk mitigation: A review. *Computers & Industrial Engineering*, 113, 646-682. https://doi.org/10.1016/j.cie.2017.09.043
- Russell, S. J., & Norvig, P. (2016). Artificial intelligence: a modern approach. Pearson.
- Sampson, M., McGowan, J., Cogo, E., Grimshaw, J., Moher, D., & Lefebvre, C. (2009). An evidence-based practice guideline for the peer review of electronic search strategies. *Journal of Clinical Epidemiology*, 62(9), 944-952. https://www.jclinepi.com/article/S0895-4356(08)00320-X/fulltext
- Santos Divino, S. B. (2021). Inteligência Artificial como sujeito de direito: construção e teorização crítica sobre pessoalidade e subjetivação. *Revista de Bioética y Derecho*, (52), 237-252. https://doi.org/10.1344/rbd2021.52.31503
- Sbai, O., Elhoseiny, M., Bordes, A., LeCun, Y., & Couprie, C. (2018). DeSIGN: Design inspiration from generative networks. In L. Leal-Taixé, & S. Roth (eds.), *Proceedings of the European Conference on Computer Vision (ECCV) Workshops* (pp. 37-44). Springer.
- Schmidt, P., Biessmann, F., & Teubner, T. (2020). Transparency and trust in artificial intelligence systems. *Journal of Decision Systems*, 29(4), 260-278. https://doi.org/10.1080/12460125.2020.1819094
- Seele, P., Dierksmeier, C., Hofstetter, R., & Schultz, M. D. (2021). Mapping the ethicality of algorithmic pricing: A review of dynamic and personalized pricing. *Journal of Business Ethics*, 170, 697-719. https://doi.org/10.1007/s10551-019-04371-w
- Taboada, I., Daneshpajouh, A., Toledo, N., & de Vass, T. (2023). Artificial Intelligence Enabled Project Management: A Systematic Literature Review. *Applied Sciences*, 13(8), 5014. https://doi.org/10.3390/app13085014



- Tshitoyan, V., Dagdelen, J., Weston, L., Dunn, A., Rong, Z., Kononova, O., Person, K. A., Ceder, G., & Jain, A. (2019). Unsupervised word embeddings capture latent knowledge from materials science literature. *Nature*, 571(7763), 95-98. https://doi.org/10.1038/s41586-019-1335-8
- Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021). Artificial intelligence in supply chain management: A systematic literature review. *Journal of Business Research*, 122, 502-517. https://doi.org/10.1016/j.jbusres.2020.09.009
- Veiga, R., & Cadete Pires, C. M. P. (2018). Impacto da inteligência artificial nos locais de trabalho. *Rede de Investigação sobre Condições de Trabalho*, 67-79.
- Von Krogh, G. (2018). Artificial intelligence in organizations: New opportunities for phenomenon-based theorizing. *Academy of Management Discoveries*, 4(4), 404-409. https://doi.org/10.5465/amd.2018.0084
- Votto, A. M., Valecha, R., Najafirad, P., & Rao, H. R. (2021). Artificial intelligence in tactical human resource management: A systematic literature review. *International Journal of Information Management Data Insights*, 1(2), 100047. https://doi.org/10.1016/j.jjimei.2021.100047
- Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2021). Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. *The International Journal of Human Resource Management*, 33(6), 1237-1266. https://doi.org/10.1080/09585192.2020.1871398
- Zarsky, T. Z. (2014). Understanding discrimination in the scored society. *Washington Law Review*, 89(4), 1375.

Notes

1

For the Computer Scientists: "Artificial intelligence (AI)—defined as a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation [...]" (Kaplan & Haenlein, 2019).

2

Virtual call centers with automated attendants, autonomous vehicles, the provision of products and services according to consumer standards, and the verification of the probability of risk of activity and decision-making in automated processes are among the activities that involve the use of Artificial Intelligence in the computer, legal and economic spheres today.



3

"For citation analysis, Scopus offers about 20 % more coverage than Web of Science, whereas Google Scholar offers results of inconsistent accuracy" (Falagas et al., 2008).

4

""Grey literature" is the term given to describe documents not published by commercial publishers, and it may form a vital component of evidence reviews such as systematic reviews and systematic maps, rapid evidence assessments and synopses. Grey literature includes academic theses, organisation reports, government papers, etc. and may prove highly influential in syntheses, despite not being formally published in the same way as traditional academic literature e.g.". (Haddaway et al., 2015)

5

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