BULLETIN OF THE TECHNOLOGICAL OBSERVATORY OF THE UNIVERSITY OF LIMA

Systems Engineering Undergraduate Program
Year 1 | No. 3 | September 2023

CONTENT

Business strategy should seek the growth and evolution of a company. An incorrect understanding of such strategy has led many companies to focus on the implementation of careful plans that aim to achieve objectives and stringent numerical targets by executing concrete actions. However, companies, from the embryonic stage, intuitively know that they will grow through persistent exploration, as well as through trial and error. The constant appearance of new technologies, new business models, new companies and even new customer segments has once again brought the need for continuous experimentation back to the forefront.

The importance that Artificial Intelligence (AI) has acquired in recent years requires companies to increase their experimental capabilities which should lead them to continuously test new tools as they emerge with a constant monitoring of how they can help reduce costs, improve income and quality or achieve some increase in their capabilities.

This bulletin explores three key aspects to incorporate AI in business:
1) AI strategy and governance, 2) impacts that should be taken into account in the ecosystem, collaborators and risks, and 3) potential use cases by industry.

ARTIFICIAL INTELLIGENCE (AI) BUSINESS STRATEGY, GOVERNANCE AND ROADMAP

Author: Percy Diez Quiñones

The emergence of AI not only allows having tools that have been steadily emerging in recent months, but it is also a catalytic technology (Young, 2023), as are the Internet, the Web, mobile devices and cloud computing. Therefore, companies should respond appropriately and in a timely manner at a strategic level.

Business leaders face three types of expectations about AI (Gartner, 2023a):

1) **Investors expect new sources of growth and better margins based on AI.**

2) **Customers will incorporate and daily expect AI technologies such as ChatGPT.**

3) **Employees will leave organizations where humans are doing work that AI could handle (Gartner, 2023b).**

SUCCESSFUL AI GOVERNANCE REQUIRES ANSWERING THREE KEY QUESTIONS:

WHAT TO DO?
You should first experiment so that you use "new things for old tasks." You should start with generative AI, which is easy to incorporate and free of charge. Apply it to intensive processes during working hours in which data are reviewed, written and calculated. Then, you should start using ready-to-use machine learning models. Later on, customized models should be created and the goal should be to "create new things for new needs."

WHO SHOULD DO IT?
Responsibility should be given to both information technology (IT) and business units. If the company already has a product-oriented organization, one of the product teams can assume such responsibility. Once value is found, AI should be seen as a transversal technological capability and not as a specialized or niche one.

HOW SHOULD IT BE DONE?
An incremental roadmap should be defined. And you should start with internal capabilities and complement them with external capabilities.

The roadmap for deploying AI in a company can have these components:	
Establish a vision for AI	Define the benefits expected to be achieved. Start with the time reduction measure; then continue with other metrics such as improved customer experience.
Make organizational adjustments	Who will be in charge of experimenting with AI technology for both IT and business? Is there a separate team required? Is it necessary to reorganize any part of the company or incorporate any role?
Understand what to learn and what to use	Evaluate which available technologies and tools can help business. Is it feasible to use machine learning to automate decisions, optimize or forecast? Is it feasible to use generative AI to increase productivity? Is it feasible to use other AI technologies such as biometric recognition, computer vision or other?
Identify barriers to AI success	Can AI be incorporated into processes? Is digitalized data available and of appropriate quality to use AI? What regulatory (Barney, 2023), reputational, competitive, legal and ethical risks exist? Is it necessary to develop a new capability in-house? Is it necessary to hire an expert?
Identify use cases	It should be recognized which proven use cases exist and which ones are to be tested. Which projects or initiatives would be the most suitable for analysis in terms of business value and ease of implementation? What can be the simplest and most highly effective initiatives (Deveau, Griffin, & Reis, 2023)?
Continue in an iterative and incremental manner	Experiment, validate and scale.

IMPACT AND MAP OF INFLUENCE OF AI ON BUSINESS

Author: Ángel Agüero (professor)

The incorporation of AI in the business world demonstrates a radical change in internal operations, customer experience and relationships with partners and suppliers (Yadav & Dwivedi, 2023). In this context, maps of influence of AI become essential tools to understand the dynamics and the effects at play.

Within organizations, AI improves operational efficiency and data analysis. Maps of influence help identify which technologies are the most relevant to each department. In customer interaction, AI enables unprecedented customization and efficiency, aspects that can be better visualized and planned with a map of influence (Perifanis & Kitsios, 2023).

It is also essential to consider the supply chain and relationships with business partners where AI offers the ability to predict and optimize processes. Finally, ethical and legal governance of AI is a critical component that should be mapped to minimize risks (Castillo & Taherdoost, 2023).

Maps of influence of AI, in short, offer a holistic view that enables companies to draw up an effective strategy in a business environment increasingly influenced by digitalization and AI.

Understanding the customer	Operational excellence	Functional optimization
Acquire / grow / retain	Administer / maintain / maximize	Alignment / arbitration / optimization
• Up-sell/cross-sell • Market basket analysis • Churn prevention • Customer segmentation • Brand monitoring	• Predictive maintenance • Assortment planning • Condition monitoring • Reverse logistics • Allocation management • Etc.	• Risk management • Threat detection • Signals analysis • Transformation analysis • Process optimization • Etc.
New businesses	Cause disruption / create / redefine	

Source: Gartner (2023).

NEW ROLES AND SKILLS REQUIRED BY AI

Author: Luis Horna (professor) and Joaquín Teves (systems engineering student)

Recent developments in AI have stoked new fears about large-scale job loss, stemming from its ability to automate a rapidly expanding set of tasks, including non-routine cognitive tasks (Aghion et al., 2017), and its potential to affect every sector of the economy.

Furthermore, there are concerns about employee well-being and the broader work environment, linked to the idea that AI may soon become pervasive in the workplace and threaten and undermine humans' place in it. However, AI also has the potential to complement and augment human capabilities, leading to higher productivity, greater demand for human labor and improved job quality (Lane & Saint-Martin, 2021).

In addition, Lane and Saint-Martin (2021) argue that, while AI is capable of performing some non-routine cognitive tasks, some bottlenecks to adoption still remain and many tasks still require humans to carry them out. Thus, much of the impact of AI on jobs is likely to be experienced through the reorganization of tasks within an occupation.

In an ever-changing work environment, companies face the challenge of adapting their employees to new demands. According to Rahilly (2020), the solution is divided into three essential strategies: relocating, upskilling and reskilling. 'Relocating' consists in moving employees to new areas of the company, 'upskilling' improves their current skills and 'reskilling' trains them in new competencies. These strategies are not only crucial for employee adaptability but also strengthen organizational resilience. Below is a list of some possible new roles and skills that may be needed due to the development of AI:

NEW ROLES THAT MAY ARISE DUE TO THE DEVELOPMENT OF AI:

Human-AI collaboration specialist

These professionals will be responsible for optimizing interaction and collaboration between human workers and AI systems in business (Organisation for Cooperation and Development, 2021).

AI ethicist

These professionals will evaluate and ensure that AI systems are implemented and adhere to ethical and legal guidelines (Deranty & Corbin, 2022).

Digital literacy trainer

These professionals will specialize in training workers in basic digital skills and in interpreting AI-generated data (OECD, 2021).

AI policy analyst

These professionals will combine understanding of AI technology with social and political implications in order to provide advice on developing policies (Deranty & Corbin, 2022).

Task reorganization manager

These professionals will be consultants who help companies to restructure roles and tasks in the context of automation in a way that ensures maximum efficiency and employee satisfaction (Green & Lamby, 2023).

NEW SKILLS THAT MAY ARISE DUE TO THE DEVELOPMENT OF AI:

AI training

Skill to teach and calibrate AI systems to improve their performance and efficiency (Deranty & Corbin, 2022; Zirar, Ali, & Islam, 2023).

AI ethics analysis

Skill to evaluate the ethical implications of AI algorithms and technologies in the workplace (Deranty & Corbin, 2022; Green & Lamby, 2023).

Management of AI-human collaboration

Set of skills to manage and optimize interaction between humans and AI systems (Green & Lamby, 2023; Zirar, Ali, & Islam, 2023).

Advanced digital literacy

In-depth knowledge of digital platforms and skill to interpret AI-driven data (Green & Lamby, 2023).

Data privacy audit

Set of skills to assess and ensure data privacy and security in environments where AI is used (OECD, 2021).

Critical thinking in the context of AI

Skill to critically analyze AI systems and their impact on the work and social environment (Deranty & Corbi, 2022; OECD, 2021).

Adaptability and continuous learning

Skill to quickly adapt to new technologies and tasks in an ever-changing environment (OECD, 2021).

Interdisciplinary communication

Skill to communicate effectively between different domains such as technology and ethics or programming and management (Zirar, Ali, & Islam, 2023).

Automation strategy

Skill to plan and execute strategies that balance automation and human employment in an ethical and effective manner (Deranty & Corbin, 2022).

Empathy and cultural understanding in the context of AI

Skill to understand and manage human emotions in environments where AI plays a prominent role, in addition to considering cultural and social differences (Zirar, Ali, & Islam, 2023).

Certain groups of workers may be more capable or better positioned to leverage the benefits that AI brings, as well as to use it in a way that complements their work and avoid its negative impacts.

LEGAL AND ETHICAL ASPECTS OF USING AI IN BUSINESS

Author: Guillermo Dávila (professor)

Generative AI should be considered as a critical element when formulating and executing any strategy aimed at improving business competitiveness. The capacity of tools such as ChatGPT to acquire and combine knowledge, as well as to apply it in final products (goods and services) that an organization offers, makes its use almost mandatory in institutions willing to survive in the current context. Strategies for the deployment and use of ChatGPT in organizations may be different and will depend on the specific context of each of them, i.e., their actions to address an issue, their products, their position in the market, their customer profile, among others.

Here, we want to address the other dimension of implementing generative AI solutions in business, and the legal and ethical aspects. Thus, one of the main ethical challenges has to do with copyright. Some companies have banned the publication of AI-generated content for fear of legal blowback, and some artists have claimed rights over artificially generated images (Kruger & Lee, 2023). The rights of use and types of licenses for each information package should be verified when using generative AI tools.

Another ethical challenge has to do with human talent management. Recently, a study by the World Economic Forum (2023) reported that 19% of the workforce in the world can have more than 50% of their tasks automated by generative AI. This implies a reconfiguration of labor structures and a higher demand for professionals skilled in the use of technology—as stated by several specialists in AI—business intelligence, information security, among others, to the detriment of more operational positions such as telemarketing and customer service executives, maintenance specialists, administrative assistants, data entry clerks, etc. This reality requires that, when formulating strategies that include generative AI, companies should consider reskilling and upskilling programs which give employees the opportunity to adapt their skills to the new needs of the organization.

Capture of AI regulations and proposals in 2023		
REGION	**APPROACH**	**EXAMPLE OF POLICIES AND LAWS**
United States (Federal Government)	AI risk management	Algorithmic Accountability Act (H.R. 6580; S. 3572)
		DEEP FAKES Accountability Act (H.R. 2395)
		Digital Services Oversight and Safety Act (H.R. 6796)
	Declaration of AI rights	White House's Blueprint for an AI Bill of Rights
	AI framework	NIST AI Risk Management Framework
United States (states and cities)	AI regulation	California, Connecticut, Texas, Illinois, Colorado, New York are some of the states and cities with AI regulation statements or laws
European Union	High-risk AI application	Artificial Intelligence Act
China	Generative AI regulation	Administrative measures for generative AI service
Canada	Risk mitigation, transparency	Parliament's Artificial Intelligence and Data Act
Others	Developing regulations	At least eight countries across America and Asia

Source: Barney (2023).

A third challenge, no less important, is associated with information legitimacy, which is a function of its level of accuracy or truthfulness, source quality, among others. By taking information from various sources without discerning its reliability or relevance for a given context, generative AI-generated content can be inaccurate, offensive or likely to perpetuate stereotypes. Companies cannot assume that all the information generated by these tools is true (Vaishya, Misra, & Vaish, 2023) and should not accept this information without verifying it first (Dwivedi et al., 2023).

The above shows that the use of AI tools in companies should follow ethical principles (UNESCO-IESALC, 2023). We should also be aware that these tools cannot substitute for a specialist (Zhang, Naradowsky, & Miyao, 2023). Organizational leaders are invited to reflect on how to get the most out of generative AI tools in such a way that they mitigate the risks arising from non-compliance of necessary ethical principles.

USE CASES FOR IMPROVING BUSINESS PRODUCTIVITY WITH AI:

White-Collar Office Work and Service Sector

Author: Carlos Torres (professor)

The "white-collar" sector is made up of professionals who usually work in offices and carry out administrative, analytical, management or other type of activities, and use specific skills and education which—although they do not involve demanding physical effort—expose them to stress and mental burnout (Pinnacle Career Institute, 2023).

The advance of technologies is accompanied by a restructuring of the labor market which affects specific sectors according to their professional profile.

The emergence and the gradual and growing acceptance of AI in business have been perceived as a high risk for the white-collar sector. Studies conducted in previous years place this risk level at 50% (Webb, 2019).

Figure 1

Level of exposure of a job compared to the use of AI based on the level of education
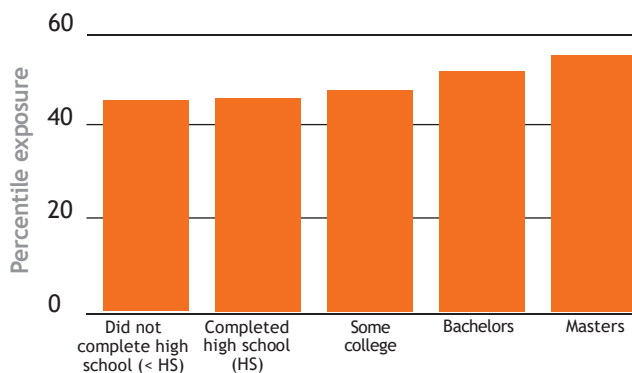
Source: Webb (2019).

However, the adoption of AI has not generated, to date, mass replacement or the expected levels of unemployment in the white-collar sector. AI can also be used as a tool to enhance the specialized work performed. There is a new reality for white-collar workers that they should face in order to maintain their employability (Button, 2019).

The use of generative AI tools in tasks such as idea generation (brainstorming), task structuring and planning (marketing), proposal writing (plans, financing), data analysis and human resource allocation have shown significant levels of improvement. For example, a group assisted by ChatGPT completed tasks 37% faster than the group that did not use this tool (groups of similar preparation). This result becomes more interesting if we consider that, when white-collar workers repeated the tasks, they completed them even faster (Tabrizi & Pahlavan; Noy & Zhang, 2023).

The transition to this new reality, as presented, is not discretionary as the combination of the white-collar worker plus the use of AI is superior to any one of these elements in isolation. If organizations intend to reap immediate benefits in such a way that replaces jobs with AI, they will put creative and innovative input from these specialized workers aside (Noy & Zhang, 2023).

USE CASES FOR IMPROVING BUSINESS PRODUCTIVITY WITH AI:

Manufacturing, Logistics, Production and Operations

Author: Joaquín Teves (systems engineering student)

In business, AI has established itself as a tool capable of reinventing various sectors. It is essential to analyze how AI can enhance efficiency in key areas such as manufacturing, logistics, production and operations.

MANUFACTURING

Intelligent systems automate repetitive processes and free up human workers to focus on higher-level tasks. At a macro level, AI enables the optimization of supply chains, early detection of machinery failures and seamless adaptation to market demands. By strategically implementing AI, manufacturing companies can minimize costs, improve product quality and speed up production cycles (Purmala, 2021).

LOGISTICS

The mastery of logistics is greatly enhanced by AI. Advanced systems can anticipate issues in shipping routes, improve the management of inventories and anticipate customer demands. Moreover, AI facilitates real-time decision-making resulting in more robust and efficient supply chains (Liao & Li, 2022).

PRODUCTION

Productivity of many companies can be increased with AI. By analyzing data in real time, AI systems adjust processes to maximize efficiency, reduce waste and increase quality. Predictive algorithms can help businesses forecast future trends resulting in a production in line with future market needs (Waltersmann et al., 2021).

OPERATIONS

Operations, essential in business ecosystem, can be optimized with AI. From resource management to financial administration, AI offers tools that lead to automation, predictive analysis and data-driven decisions. With AI, operations become more versatile, precise and proactive (Tariq, Poulin, & Abonamah, 2021).

More than a technological tool, AI is positioned as a vector change and progressive innovation. By integrating its potential in manufacturing, logistics, production and operations, companies prepare to lead a new era of excellence and competitiveness. It is imperative for organizations to recognize and adopt the skills offered by AI to consolidate and excel in their respective fields.

Area	Tool	Description	Improvement
Manufacture (Purmala, 2021)	Computer vision systems	Cameras and sensors that monitor product quality in real time	Reduced defects and improved quality control
	Predictive maintenance	Algorithms that anticipate machine maintenance	Reduction of unplanned shutdowns
Logistics (Liao & Li, 2022)	Route optimization	Systems that calculate the most efficient routes for transportation	Reduced time and transportation costs
	Intelligent systems for inventory management	Platforms that predict inventory needs based on sale trends	Reduction of unsold stock and improved stock availability
Production (Waltersmann et al., 2021)	Automated quality control	Systems that inspect and ensure that products meet quality standards	Improved quality of final product
	Robotic process automation (RPA)	Robots programmed to carry out repetitive and specific tasks	Increased efficiency and reduced human errors
Operations (Tariq, Poulin, & Abonamah, 2021)	Customer service Chatbots	Bots that deal with common customer queries and issues	Improved customer service and reduced waiting times
	Automated financial analysis	Systems that process and analyze financial data to provide clear insights and predictions	Optimization in financial decision-making

Table of use case examples

USE CASES FOR IMPROVING BUSINESS PRODUCTIVITY WITH AI:

Resource Extraction and Exploitation Work

Author: Josefina Toribio (communication student)

The way in which challenges are addressed and opportunities are maximized in resource extraction and exploitation, a crucial area for global economy, is constantly being changed by AI.

OIL AND GAS INDUSTRY

AI is used in the oil and gas industry to increase productivity; boost security; enhance equipment availability, maintenance and uptime; and enable sustainable operations. In addition, AI is used to optimize production when areas of inefficiency are identified; for example, AI is applied with machine learning, IoT and big data techniques to improve workplace safety. These tools are also used to recognize warning signs; for example, dangerous levels of gases and access by unauthorized personnel, as part of the monitoring of field operations (Chung, 2022).

MINERAL PROCESSING AND EXPLORATION

AI is now recognized as a tool for the cost-effective and efficient extraction of mineral resources. One example is the case of ALS GoldSpot Discoveries, which combines geoscience expertise with AI and data science to solve problems in mineral exploration and mining. Moreover, it has a useful feature called LithoLens, an imaging technology with deep learning algorithms that automatically examines old core photos (cylindrical rock or soil samples) and transforms them into an intact georeferenced digital core image (Lisowski, 2022).

ENVIRONMENTAL SUSTAINABILITY ASSESSMENT

AI-driven analytics is used in the analysis of data in geological studies in order to identify areas where there is greater concentration of resources, which allows for a more efficient extraction. In addition, AI-driven task automation can be used to reduce the amount of labor required for resource extraction, leading to lower CO_2 emissions and a more efficient use of resources. In terms of environmental sustainability audit, AI can be leveraged in the monitoring of activities carried out by the companies involved in the extraction of natural resources. Through AI-enabled cameras, the vehicles used in the extraction process can be detected and tracked. In this manner, this technology can also enhance the timely detection of environmentally irresponsible activities such as illegal logging or illegal mining (Frąckiewicz, 2023).

In conclusion, the integration of AI in the resource extraction and exploitation industry has resulted in tangible improvements and a more innovative and conscious approach.

BIBLIOGRAPHIC REFERENCES

Aghion, Ph. et al. (2017). Artificial Intelligence and Economic Growth, *NBER Working Paper Series, No. 23928*.
http://www.nber.org/papers/w23928

Barney, N. (2023). *Artificial intelligence (AI) governance*. TechTarget.
https://www.techtarget.com/searchenterpriseai/definition/AI-governance#:~:text=Artificial%20intelligence%20governance%20is%20the,in%20ethical%20and%20responsible%20ways

Button, G. (2019, November 10). *Augmentative AI and the future of work*. Stanford University Human-Centered Artificial Intelligence.
https://hai.stanford.edu/news/augmentative-ai-and-future-work

Castillo, M. J. & Taherdoost, H. (2023). The impact of AI technologies on e-business. *Encyclopedia, 3*(1). Article 1.
https://doi.org/10.3390/encyclopedia3010009

Chung, P. (2022, October 10). *6 remarkable applications of AI in the oil and gas industry*. Acuvate.
https://acuvate.com/blog/six-applications-of-ai-in-oil-gas-industry/

Deranty, J.-P. & Corbin, T. (2022). Artificial intelligence and work: A critical review of recent research from the social sciences. AI & Society.
https://doi.org/10.1007/s00146-022-01496-x

Deveau, R., Griffin, S., & Reis, S. (2023). *AI-powered marketing and sales reach new heights with generative AI*. McKinsey & Company.

Dwivedi, Y. K. et al. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management, 71*(102642).

Foro Económico Mundial. (2023). *Future of Jobs Report 2023*. [The author].
https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

Frąckiewicz, M. (2023, May 3). *The Potential of Artificial Intelligence in Environmental Sustainability Assessment of Natural Resource Extraction*. Ts2.
https://ts2.space/en/the-potential-of-artificial-intelligence-in-environmental-sustainability-assessment-of-natural-resource-extraction/

Gartner. (2023a). *GenAI Planning Workbook*. Gartner.

Gartner. (2023b). *What Generative AI Means for Business*. Gartner.
https://www.gartner.com/en/insights/generative-ai-for-business?utm_campaign=RM_GB_2023_ITAI_C_BB1_GENAIDIGEST_MR&utm_medium=email&utm_source=Eloqua&cm_mmc=Eloqua-_-Email-_-LM_RM_GB_2023_ITAI_C_BB1_GENAIDIGEST_MR-_-0000

Green, A. & Lamby, L. (2023, February). The supply, demand and characteristics of the AI workforce across OECD countries. OECD Social, *Employment and Migration Working Papers, 287*.
https://doi.org/10.1787/bb17314a-en

Kruger, L. & Lee, M. (2023, March 13). *Risks and ethical considerations of generative AI*. Deloitte.
https://ukfinancialservicesinsights.deloitte.com/post/102i7s2/risks-and-ethical-considerations-of-generative-ai

Lane, M. & Saint-Martin, A. (2021). OECD Social, Employment and Migration Working Papers. *The impact of artificial intelligence on the labour market: What do we know so far?, 256*.
https://doi.org/10.1787/7c895724-en

Liao, L. & Li, A. (2022). An intelligent system to automate the inquery in logistics industry using AI and machine learning. *Computer Science & Information Technology (CS & IT)*, 105-113. https://doi.org/10.5121/csit.2022.120109

Lisowski, E. (2022, July 18). *How is AI enhancing the mining industry?* Addepto.
https://addepto.com/blog/how-is-ai-enhancing-the-mining-industry/

Noy, S. & Zhang, W. (2023, March 2). *Experimental evidence on the productivity effects of generative artificial intelligence*. MIT Department of Economics. https://economics.mit.edu/sites/default/files/inline-files/Noy_Zhang_1.pdf

Organización para la Cooperación y el Desarrollo Económicos (OECD). (2021, March). *Demand for AI skills in jobs: Evidence from online job postings. OECD Science, Technology and Industry Working Papers*. https://doi.org/10.1787/3ed32d94-en

Perifanis, N.-A. & Kitsios, F. (2023). Investigating the influence of artificial intelligence on business value in the digital era of strategy: a literature review. *Information, 14*(2), article 2. https://doi.org/10.3390/info14020085

Pinnacle Career Institute. (2023, August 16). *What is white-collar vs. blue-collar?* Pinnacle Career Institute. https://blog.pcitraining.edu/blog/what-is-white-collar-vs.-blue-collar

Purmala, Y. A. (2021). Implementation of machine learning to increase productivity in the manufacturing industry: A literature review. *Operations Excellence: Journal of Applied Industrial Engineering, 13*(2), article 2. https://doi.org/10.22441/oe.2021.v13.i2.026

Rahilly, L. (2020). *Today's skills, tomorrow's jobs: How will your team fare in the future of work?* McKinsey & Company. https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/todays-skills-tomorrows-jobs-how-will-your-team-fare-in-the-future-of-work

Tabrizi, B. & Pahlavan, B. (2023, June 23). *Companies that replace people with AI will get left behind*. Harvard Business Review. https://hbr.org/2023/06/companies-that-replace-people-with-ai-will-get-left-behind

Tariq, M. U., Poulin, M., & Abonamah, A. A. (2021). Achieving Operational Excellence Through Artificial Intelligence: Driving Forces and Barriers. *Frontiers in Psychology, 12*. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.686624

UNESCO-IESALC. (2023). *ChatGPT e inteligencia artificial en la educación superior: Guía de inicio rápido* [PDF]. https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-e-Inteligencia-Artificial-en-la-educacio%CC%81 n-superior-Gui%CC%81a-de-inicio-ra%CC%81pido_FINAL_ESP.pdf

Vaishya, R., Misra, A., & Vaish, A. (2023). ChatGPT: Is this version good for healthcare and research? *Diabetes and Metabolic Syndrome, 17*(4), 102744.

Waltersmann, L. et al. (2021). Artificial intelligence applications for increasing resource efficiency in manufacturing companies—A comprehensive review. *Sustainability, 13*(12), 6689. https://doi.org/10.3390/su13126689

Webb, M. (2019, November 6). The impact of artificial intelligence on the labor market. https://ssrn.com/abstract=3482150 or http://dx.doi.org/10.2139/ssrn.3482150

Yadav, M. K. & Dwivedi, N. (2023). Impact of AI on business. *IJFMR - International Journal for Multidisciplinary Research, 5*(3). https://doi.org/10.36948/ijfmr.2023.v05i03.2791

Young, C. (2023, July 14). *Build a winning AI strategy for your business*. Harvard Business Review.

Zhang, Q., Naradowsky, J., & Miyao, Y. (2023). Ask an expert: Leveraging language models to improve strategic reasoning in goal-oriented dialogue models. In arXiv [cs.CL]. http://arxiv.org/abs/2305.17878

Zirar, A., Ali, S. I., & Islam, N. (2023). Worker and workplace Artificial Intelligence (AI) coexistence: Emerging themes and research agenda. *Technovation, 124*, 102747. https://doi.org/10.1016/j.technovation.2023.102747

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