

Artificial Intelligence Technologies in Business Consulting

Subjects: Business

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Artificial intelligence (AI) affects all aspects of a business, significantly contributing to problem-solving and introducing new operational processes within companies. Interest in AI is growing due to its capacities regarding the efficiency of operations, reduced working time, and quality improvements.

Keywords: artificial intelligence ; ethical challenges ; business consulting ; technological impact

1. Introduction

Artificial intelligence is generally perceived as a research field of information technology and computer science, and it mainly focuses on designing and projecting intelligent providers ^[1], generating a remarkable impact on large domains of society and the economy ^[2]. The linguistic concept of “artificial intelligence (AI)” originated in 1956, and, as a field of study, it aims to conceptualize and represent intelligent behavior as a computing process. According to Boucher ^[3], AI illustrates a specific program that provides intelligent behavior by continuously examining its surroundings and making the necessary efforts to achieve its goal.

In terms of practical applications, AI has become one of the most attractive, but also emerging and disruptive technologies of the last years ^[4]. It is a widely debated research topic in various fields such as engineering, science, education, medicine, or economics. In business, AI-based systems with access to a vast database can be used in management, accounting, finance, human resources, marketing, and sales, potentially increasing revenue and decreasing costs. Artificial intelligence and the continuous learning capability of AI-equipped programs thus generate increased innovation, optimization within processes or resource management, and quality improvement ^[5].

2. The Evolution of Artificial Intelligence and Its Professional and Ethical Impact

An intelligent agent is defined as a knowledge-based system that analyzes the surroundings, reasons to interpret the perceptions, solves issues, and determines solutions to accomplish specific tasks for which it was designed ^[6]. It extracts its data and knowledge based on which it will act, and continuously adapts to the given assignment ^[6]. Artificial intelligence is intelligence associated with machines, in contrast to natural intelligence specific to humans and animals ^[7]. AI is mainly developed to have speech recognition, machine-learning, planning, and problem-solving attributes ^[8]. AI is applicable in computer science. Therefore, it implicates constructing devices that execute specific operations that would require intelligence if accomplished by humans ^[9].

The technical and managerial scientific literature offers multiple definitions of AI. Thus, AI can be seen as a new way computers are programmed to think in the same way that people do ^[10]. Artificial intelligence reflects the automation of human thinking, such as decision making, problem solving, or learning ^[11]. On the other hand, AI is characterized by a study of the computations that make perception, reason, and action possible ^[8]. Russell and Norvig ^[12] distinguish four approaches to AI that aim to simulate human thought, rational thinking, human actions, and rational actions by a programmable machine. Finally, it is reasonable to predict that AI will eventually impact all human activities, individual, professional, and social ^[13].

Large companies use this technology to implement marketing, human resources, or production strategies. However, increasingly frequent questions arise from the considerable development of AI applications and the determined implications, such as the replacement of the workforce and activities carried out by humans, or ethical issues: AI may cause significant job losses and could change the idea of employment ^[14], or it may exit from human control and even have the power of managing its own evolution ^[15].

Numerous researchers broadly study data privacy and security, as individuals should have complete control over their personal data, and their usage should not cause any harm or discrimination ^[16]. Privacy refers to controlling information about oneself and the right to keep it secret ^[17]. Artificial intelligence offers the ability to organize and store a large set of data, which entails the vulnerability and risk of personal information being accessed by other entities and used without the owners' consent ^[18]. There may be situations where personal information is traded for a fee between entities and used in marketing and advertising processes, more quickly identifying the target market to promote their products or services ^[19].

Because controlling personal data is much more difficult online than in a physical format, most of the details of people's lives are becoming increasingly accessible digitally, where data are collected and visible on high-capacity servers or in the cloud ^[20]. Many technologies that use AI amplify these problems. By using specific techniques, such as fingerprints or facial recognition, these technologies enable the identification of individuals and create a profile for each user ^[21]. Well-established legal protection of individual rights, including consumer rights or the responsibility for protecting intellectual property rights, is often lacking in digital products, or is challenging to implement ^[17]. Leslie ^[22] summarizes (**Table 1**) the potential damages a system based on artificial intelligence can produce.

Table 1. Risks of artificial intelligence.

Bias and Discrimination	Data-driven technologies have the potential to duplicate, reinforce, and magnify practices of marginalization, inequality, and prejudice that are presently found in societies. Similarly, these technologies risk replicating their developers' preconceptions and biases because many of the features, metrics, and analytical frameworks of the models that allow data mining are selected by their developers.
Denial of Individual Autonomy, Recourse, and Rights	If individuals are subject to conclusions, forecasts, or categories created by AI algorithms, circumstances might occur where such individuals cannot hold the parties responsible for the results directly accountable. AI systems can automate cognitive tasks previously only performed by responsible human representatives. Such a lack of responsibility may impair autonomy and breach the rights of those impacted in the event of harm or bad results.
Non-transparent, Unexplainable, or Unjustifiable Outcomes	AI algorithms may deliver unreliable or poor-quality results if there is irresponsible data management, negligent design or programming processes, and uncertain implementation practices. These results can directly harm the well-being of individuals and the public welfare.
Invasions of Privacy	Because AI projects are anchored in data structuring and processing, the development of AI technologies will frequently involve personal data. These data are sometimes collected and extracted without obtaining the approval of the data owner or are processed in a way that reveals personal information.
Isolation and Disintegration of Social Connection	AI algorithms can vastly improve consumer lives and service delivery by generating unique experiences and personalizing digital services, although this ability also has potential risks. Excessive automation could decrease the need for human interactions.

Source: Adapted from the relevant literature ^[22].

The digitalization is continuously expanding, and technology is undergoing significant changes. Therefore, regulations should be adapted accordingly ^[23]. Artificial intelligence must comply with all applicable national and international legislation and regulations, and a set of requirements, such as safe, reliable, and robust algorithms to correct mistakes or inconsistencies throughout all phases of the AI systems lifecycle ^[24]. All AI systems should guarantee transparency, diversity, non-discrimination, and fairness while equally ensuring the accessibility of all users ^[25]. The European Commission's High-Level Expert Group on AI ^[26] states that the well-being of society and the environment must be protected by intelligent systems and AI should be used to promote positive social change and improve environmental sustainability.

3. Business Consulting and the Impact of Artificial Intelligence on Business Professionals

Business consultants operate in multiple industries and with a variety of clients. Through their activities, they gather experience and valuable information that they can use and adapt according to the requirements. Nowadays, most consultants are asked to provide not only advice but also solutions, such as changing a company's strategy ^[27]. Generally, there are no universal, standardized criteria for selecting a consultant because each client can define personal standards which reflect the company's expectations and experience in consulting services. However, the price is often seen as an indicator of quality ^[28].

With digital access to data and equally available technologies, it takes more effort to differentiate between consulting firms. What can be considered a general characteristic is the consultant's focus on the client and his needs, the goal of the consulting services being to solve the problems he faces as quickly and efficiently as possible ^[27]. Understanding and fully leveraging the data they operate with is one of the most important skills a consultant must possess ^[29]. Companies collect data continuously, being, at the same time, concerned with how these data are processed and exploited by consultants. They must maintain professional and ethical standards when working with their clients, having an obligation to keep the information obtained confidential ^[30].

The concept of digital business transformation is the use of technology to design unique business models, procedures, or techniques, providing greater efficiency, attracting additional revenue, and increasing the competitive advantage ^[31]. Digital transformation is also specific to companies in the field of business consulting, being able to have a positive and successful impact only with a solid strategy and management ^[32]. Machine-learning algorithms can build models and understand complex correlations through pattern detection, a challenging process for even the most promising and effective consulting teams ^[33]. If managed precisely, AI and automation can remarkably improve these firms' functionality and customer services ^[34]. The benefits of using AI in business consulting are considered, according to Bayati ^[35], the following: AI has a fast and accurate ability to analyze large-scale data, better knowledge of the market and users, high efficiency in performing administrative tasks, and it can guide companies to allocate their financial resources properly.

All AI-based systems have a social and ethical impact on stakeholders and communities. The main goal regarding these systems is to achieve innovation to benefit society, but there are situations where they have the opposite impact. The new field of AI ethics has mainly appeared as a reaction to the individual and societal harms that the mishandling, poor configuration, or unintended damaging results of AI technologies can generate ^[36]. Leslie ^[22] suggests that, to develop and use a system based on artificial intelligence responsibly, it must be equitable and ethical, considering its impact on the well-being of individuals and the community. The use of an AI-based system must be fair and non-discriminatory, trustworthy, and transparent ^[22].

References

1. Ndrejaj, A.; Ali, M. Artificial Intelligence Governance: A Study on the Ethical and Security Issues that Arise. In Proceedings of the 2022 International Conference on Computing, Electronics & Communications Engineering (iCCECE), Southend, UK, 17–18 August 2022; pp. 104–111.
2. Saghir, A.M.; Vahidipour, S.M.; Jabbarpour, M.R.; Sookhak, M.; Forestiero, A. A survey of artificial intelligence challenges: Analyzing the definitions, relationships, and evolutions. *Appl. Sci.* 2022, 12, 4054.
3. Boucher, P. Artificial Intelligence: How Does It Work, Why Does It Matter, and What Can We Do about It? Panel for the Future of Science and Technology, European Parliamentary Research Service. 2020. Available online: [https://www.europarl.europa.eu/stoa/en/document/EPRS_STU\(2020\)641547](https://www.europarl.europa.eu/stoa/en/document/EPRS_STU(2020)641547) (accessed on 17 January 2023).
4. Yigitcanlar, T.; Desouza, K.C.; Butler, L.; Roozkhosh, F. Contributions and risks of artificial intelligence (AI) in building smarter cities: Insights from a systematic review of the literature. *Energies* 2020, 13, 1473.
5. Cioffi, R.; Travagliani, M.; Piscitelli, G.; Petrillo, A.; De Felice, F. Artificial Intelligence and Machine Learning Applications in Smart Production: Progress, Trends, and Directions. *Sustainability* 2020, 12, 492.
6. Dziat, I. Inteligena Artificiala; Publisher UAV: Arad, Romania, 2008; pp. 28–31.
7. Pan, Y. Heading toward Artificial Intelligence 2.0. *Engineering* 2016, 2, 409–413.
8. Joiner, I.A. Artificial Intelligence: AI is Nearby. In *Emerging Library Technologies*; Chandos Publishing: Amsterdam, The Netherlands, 2018; pp. 1–22.
9. Fjelland, R. Why general artificial intelligence will not be realized. *Humanit. Soc. Sci. Commun.* 2020, 7, 10.
10. Sarker, I.H. AI-Based Modeling: Techniques, Applications and Research Issues Towards Automation, Intelligent and Smart Systems. *SN Comput. Sci.* 2022, 3, 158.
11. Fenwick, A.; Molnar, G. The importance of humanizing AI: Using a behavioral lens to bridge the gaps between humans and machines. *Discov. Artif. Int.* 2022, 2, 14.
12. Russel, S.; Norvig, P. *Artificial Intelligence A Modern Approach*, 3rd ed.; Pearson-Prentice Hall: Hoboken, NJ, USA, 2010; pp. 1–5.
13. Makridakis, S. The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures* 2017, 90, 46–60.

14. Jaiswal, A.; Arun, C.J.; Varma, A. Rebooting employees: Upskilling for artificial intelligence in multinational corporations. *Int. J. Hum. Res.* 2022, 33, 1179–1208.
15. Bostrom, N. Ethical issues in advanced artificial intelligence. In *Science Fiction and Philosophy: From Time Travel to Superintelligence*; Schneider, S., Ed.; John Wiley & Sons: Hoboken, NJ, USA, 2009; pp. 277–284. Available online: <https://nickbostrom.com/ethics/ai.pdf> (accessed on 20 January 2023).
16. Tucker, C. Privacy, Algorithms, and Artificial Intelligence. In *The Economics of Artificial Intelligence: An Agenda*; Agrawal, A., Gans, J., Goldfarb, A., Eds.; University of Chicago Press: Chicago, IL, USA, 2019; Volume 17, pp. 423–437. Available online: <http://www.nber.org/chapters/c14011> (accessed on 10 January 2023).
17. Müller, V.C. Ethics of artificial intelligence and robotics. In *The Stanford Encyclopedia of Philosophy*; Zalta, E.N., Ed.; Metaphysics Research Lab Stanford University: Stanford, CA, USA, 2020; Available online: <https://plato.stanford.edu/entries/ethics-ai/> (accessed on 18 January 2023).
18. Murdoch, B. Privacy and artificial intelligence: Challenges for protecting health information in a new era. *BMC Med. Ethics* 2021, 22, 122.
19. Costa, E.; Halpern, D. *The Behavioural Science of Online Harm and Manipulation, and What to Do About It*; The Behavioural Insights Ltd.: London, UK, 2019; pp. 13–30.
20. Abdulsalam, Y.S.; Hedabou, M. Security and Privacy in Cloud Computing: Technical Review. *Future Internet* 2022, 14, 11.
21. Mann, M.; Smith, M. Automated facial recognition technology: Recent developments and approaches to oversight. *UNSW Law J.* 2017, 40, 121–145.
22. Leslie, D. *Understanding Artificial Intelligence Ethics and Safety—A Guide for the Responsible Design and Implementation of AI Systems in the Public Sector*; The Alan Turing Institute: London, UK, 2019; pp. 3–23.
23. Forradellas, R.F.R.; Gallastegui, L.M.G. Digital Transformation and Artificial Intelligence Applied to Business: Legal Regulations, Economic Impact and Perspective. *Laws* 2021, 10, 70.
24. Freiman, O. Making sense of the conceptual nonsense ‘trustworthy AI’. *AI Ethics* 2022.
25. Felzmann, H.; Villaronga, E.F.; Lutz, C.; Tamo-Larrieux, A. Transparency you can trust: Transparency requirements for artificial intelligence between legal norms and contextual concerns. *Big Data Soc.* 2019, 6, 1–14.
26. European Commission’s High-Level Expert Group on AI. *Ethics Guidelines for Trustworthy AI*; European Commission: Brussels, Belgium, 2019; pp. 9–24. Available online: <https://digital-strategy.ec.europa.eu/en/policies/expert-group-ai> (accessed on 13 January 2023).
27. Toppin, G.; Czerniawska, F. *Business Consulting—A Guide to How It Works and How to Make It Work*; The Economist: London, UK, 2005; pp. 3–13.
28. Christensen, C.M.; Wang, D.; Bever, D. Consulting on the Cusp of Disruption. *Harv. Bus. Rev.* 2013, 10, 1–10.
29. Banai, M.; Tulimieri, P. Knowledge, skills and personality of the effective business consultant. *J. Manag. Develop.* 2013, 32, 886–900.
30. Mingaleva, Z. Ethical Principles in Consulting. *Procedia Soc. Behav. Sci.* 2013, 84, 1740–1744.
31. Schwertner, K. Digital transformation of business. *Trakia J. Sci.* 2017, 15, 388–393.
32. Crişan, E.L.; Stanca, L. The digital transformation of management consulting companies: A qualitative comparative analysis of Romanian industry. *Inf. Syst. E-Busin. Manag.* 2021, 19, 1143–1173.
33. Libert, B.; Beck, M. AI may soon replace even the most elite consultants. *Harv. Bus. Rev.* 2017, 7. Available online: <https://hbr.org/2017/07/ai-may-soon-replace-even-the-most-elite-consultants> (accessed on 19 January 2023).
34. Carmona, D. *The AI Organization*; O’Reilly: Sebastopol, CA, USA, 2020; pp. 80–82.
35. Bayati, M. *AI in Consulting*. Bachelor’s Thesis, Degree Programme in Business Information Technology, Haaga-Helia University of Applied Sciences, Helsinki, Finland, 20 November 2019. Available online: https://www.theseus.fi/bitstream/handle/10024/266319/MutasimBayati_FinalThesis1.pdf?sequence=2&isAllowed=y (accessed on 9 February 2023).
36. Siau, K.; Wang, W. Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI. *J. Database Manag.* 2020, 31, 74–87.

