

ADVANCING JOB DESIGN THROUGH ARTIFICIAL INTELLIGENCE: BIBLIOMETRIC DATA-BASED INSIGHTS AND SUGGESTIONS FOR FUTURE RESEARCH

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ABSTRACT

As the digital transformation of businesses reshapes jobs to delegate tasks to technology, human resource professionals and managers find themselves at a crossroads when it comes to designing and redesigning jobs, especially under the influence of artificial intelligence (AI). Being an emerging topic, this article aims to synthesize the current state-of-the-art literature regarding the application of AI for job design purposes using a multi-technique bibliometric analysis followed by a literature review in compliance with the rigorous Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines. The research presents the findings grounded in data from 67 Scopus-indexed publications, which was analyzed with a combination of descriptive bibliometric analysis, co-authorship, bibliographic coupling, and co-occurrence analysis, helping us identify past scientific directions as well as draft a future research agenda. As one of the first bibliometric analyses in the field, it contributes to the scientific discourse by revealing the core themes of the literature, including job characteristics impacted by AI and data-driven human resource (HR) practices, group-level AI integration in job design, AI-related job skills of the future of the workforce, human-AI trust and labor relations and the role of algorithmic human resource management (HRM) in job design. Further, we stress seven distinct pathways for future research.

Keywords: *Job design, Work design, Artificial intelligence, Bibliometric review.*

JEL classification: *M12.*

REFERENCES

- Bakker, A.B. and de Vries, J.D. (2021), "Job Demands–Resources theory and self-regulation: New explanations and remedies for job burnout", *Anxiety, Stress, & Coping*, Vol. 34 No. 1, pp. 1-21.
- Berretta, S., Tausch, A., Peifer, C. and Kluge, A. (2023), "The Job Perception Inventory: considering human factors and needs in the design of human–AI work", *Frontiers in Psychology*, Vol. 14, Article 1128945.
- Bhargava, A., Bester, M. and Bolton, L. (2021), "Employees' perceptions of the implementation of robotics, artificial intelligence, and automation (RAIA) on job satisfaction, job security, and employability", *Journal of Technology in Behavioral Science*, Vol. 6 No. 1, pp. 106-113.

- Biondi, G., Cagnoni, S., Capobianco, R., Franzoni, V., Lisi, F.A., Milani, A. and Vallverdú, J. (2023), "Ethical design of artificial intelligence-based systems for decision making", *Frontiers in Artificial Intelligence*, Vol. 6, Article 1250209.
- Boehmer, N. and Schinnenburg, H. (2023), "Critical exploration of AI-driven HRM to build up organizational capabilities", *Employee Relations: The International Journal*, Vol. 45 No. 5, pp. 1057-1082.
- Bohr, A. and Memarzadeh, K. (2020), "The rise of artificial intelligence in healthcare applications", in *Artificial Intelligence in Healthcare*, Academic Press, pp. 25-60.
- Boonstra, A. and Laven, M. (2022), "Influence of artificial intelligence on the work design of emergency department clinicians: A systematic literature review", *BMC Health Services Research*, Vol. 22 No. 1, Article 669.
- Cahill, J., Howard, V., Huang, Y., Ye, J., Ralph, S. and Dillon, A. (2022), "Future of work and work systems: Machine learning and artificial intelligence for designing smart, safe, healthy and ethical work in financial services", in *Human-Automation Interaction: Manufacturing, Services and User Experience*, Springer International Publishing, Cham, pp. 3-45.
- Çalli, B.A. and Çalli, L. (2022), "Understanding the utilization of artificial intelligence and robotics in the service sector", in *The Impact of Artificial Intelligence on Governance, Economics and Finance, Volume 2*, Springer Nature Singapore, Singapore, pp. 243-263.
- Cebulla, A., Szpak, Z., Howell, C., Knight, G. and Hussain, S. (2023), "Applying ethics to AI in the workplace: The design of a scorecard for Australian workplace health and safety", *AI & Society*, Vol. 38 No. 2, pp. 919-935.
- Charlwood, A. and Guenole, N. (2022), "Can HR adapt to the paradoxes of artificial intelligence?", *Human Resource Management Journal*, Vol. 32 No. 4, pp. 729-742.
- De Greene, K.B. (1991), "Rigidity and fragility of large sociotechnical systems: Advanced information technology, the dominant coalition, and paradigm shift at the end of the 20th century", *Behavioral Science*, Vol. 36 No. 1, pp. 64-79.
- de Sio, F.S. (2024), "Artificial intelligence and the future of work: Mapping the ethical issues", *The Journal of Ethics*, pp. 1-21.
- Eftimov, L. and Kitanovikj, B. (2023), "Unlocking the path to AI adoption: Antecedents to behavioral intentions in utilizing AI for effective job (re) design", *Journal of Human Resource Management*, Vol. 26 No. 2, pp. 123-134.
- Flandrin, P., Hellemans, C., Van der Linden, J. and Van de Leemput, C. (2021), "Smart technologies in hospitality: Effects on activity, work design and employment. A case study about chatbot usage", in *Proceedings of the 17th Ergonomie et Informatique Avancée Conference*, pp. 1-11.
- Franken, A., Manthei, C., Senderek, R., & Stich, V. (2023, April). Demands And Challenges For SME Regarding The Human-Centered Implementation Of Innovative Technologies And AI. In *Proceedings of the Conference on Production Systems and Logistics: CPSL 2023* (pp. 718-727). publish-Ing.
- Fréour, L., Pohl, S. and Battistelli, A. (2021), "How digital technologies modify the work characteristics: a preliminary study", *The Spanish Journal of Psychology*, Vol. 24, e14.
- Gabriel, I. (2022), "Toward a theory of justice for artificial intelligence", *Daedalus*, Vol. 151 No. 2, pp. 218-231.
- Gabriel, S., Bentler, D., Grote, E. M., Junker, C., zu Wendischhoff, D. M., Bansmann, M., ... and Dumitrescu, R. (2022), "Requirements analysis for an intelligent workforce planning system: a socio-technical approach to design AI-based systems", *Procedia CIRP*, Vol. 109, pp. 431-436.
- Glikson, E. and Woolley, A. W. (2020), "Human trust in artificial intelligence: Review of empirical research", *Academy of Management Annals*, Vol. 14 No. 2, pp. 627-660.

- Huang, M. H., Rust, R. and Maksimovic, V. (2019), "The feeling economy: Managing in the next generation of artificial intelligence (AI)", *California Management Review*, Vol. 61 No. 4, pp. 43-65.
- Hughes, C., Robert, L., Frady, K. and Arroyos, A. (2019), "Artificial intelligence, employee engagement, fairness, and job outcomes", in *Managing Technology and Middle-and Low-Skilled Employees*, Emerald Publishing Limited, Bingley, pp. 61-68.
- Jain, R., Garg, N. and Khera, S.N. (2023), "Effective human–AI work design for collaborative decision-making", *Kybernetes*, Vol. 52 No. 11, pp. 5017-5040.
- Jevnaker, B.H. and Olaisen, J.L. (2022), "The knowledge work of the future and the future of knowledge work", in Proceedings of the 23rd European Conference on Knowledge Management, *Academic Conferences International*, Lisbon, Vol. 23 No. 1.
- Kauffeld, S., Tartler, D., Gräfe, H., Windmann, A.K. and Sauer, N.C. (2022), "What will mobile and virtual work look like in the future?—Results of a Delphi-based study", *Gruppe. Interaktion. Organisation. Zeitschrift für Angewandte Organisationspsychologie*, Vol. 53 No. 2, pp. 189-214.
- Kaushal, N., Kaurav, R.P.S., Sivathanu, B. and Kaushik, N. (2023), "Artificial intelligence and HRM: identifying future research agenda using systematic literature review and bibliometric analysis", *Management Review Quarterly*, Vol. 73 No. 2, pp. 455-493.
- Kessler, M.M. (1963), "Bibliographic coupling between scientific papers", *American Documentation*, Vol. 14 No. 1, pp. 10-25.
- Korhonen, T., Selos, E., Laine, T. and Suomala, P. (2021), "Exploring the programmability of management accounting work for increasing automation: an interventionist case study", *Accounting, Auditing & Accountability Journal*, Vol. 34 No. 2, pp. 253-280.
- Langer, M., König, C.J. and Busch, V. (2021), "Changing the means of managerial work: effects of automated decision support systems on personnel selection tasks", *Journal of Business and Psychology*, Vol. 36 No. 5, pp. 751-769.
- Leyer, M. and Schneider, S. (2021), "Decision augmentation and automation with artificial intelligence: threat or opportunity for managers?", *Business Horizons*, Vol. 64 No. 5, pp. 711-724.
- Mendling, J., Decker, G., Hull, R., Reijers, H.A. and Weber, I. (2018), "How do machine learning, robotic process automation, and blockchains affect the human factor in business process management?", *Communications of the Association for Information Systems*, Vol. 43 No. 1, pp. 19.
- Mohaghegh, S., Popa, A. and Ameri, S. (2000), "Design optimum frac jobs using virtual intelligence techniques", *Computers & Geosciences*, Vol. 26 No. 8, pp. 927-939.
- Moore, P.V. (2019), "OSH and the future of work: benefits and risks of artificial intelligence tools in workplaces", in *Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management. Human Body and Motion: 10th International Conference*, DHM 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26–31, 2019, Proceedings, Part I, Springer International Publishing, Cham, pp. 292-315.
- Naqshbandi, M.M., Kabir, I., Ishak, N.A. and Islam, M.Z. (2024), "The future of work: work engagement and job performance in the hybrid workplace", *The Learning Organization*, Vol. 31 No. 1, pp. 5-26.
- Oldham, G.R. and Fried, Y. (2016), "Job design research and theory: past, present and future", *Organizational Behavior and Human Decision Processes*, Vol. 136, pp. 20-35.
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., ... and Moher, D. (2021), "The PRISMA 2020 statement: an updated guideline for reporting systematic reviews", *BMJ*, Vol. 372.

- Parent-Rocheleau, X. and Parker, S.K. (2022), "Algorithms as work designers: how algorithmic management influences the design of jobs", *Human Resource Management Review*, Vol. 32 No. 3, 100838.
- Pennathur, P.R., Boksa, V., Pennathur, A., Kusiak, A. and Livingston, B. (2024), "The future of office and administrative support occupations in the era of artificial intelligence: a bibliometric analysis", arXiv preprint arXiv:2405.03808, available at: <https://arxiv.org/abs/2405.03808> (accessed 26 November 2024).
- Qiu, H., Li, M., Bai, B., Wang, N. and Li, Y. (2022), "The impact of AI-enabled service attributes on service hospitableness: the role of employee physical and psychological workload", *International Journal of Contemporary Hospitality Management*, Vol. 34 No. 4, pp. 1374-1398.
- Rogiers, P. and Collings, D.G. (2024), "The end of jobs? Paradoxes of job deconstruction in organizations", *Academy of Management Perspectives*, Vol. 38 No. 2, pp. 177-196.
- Sampson, S.E. (2021), "A strategic framework for task automation in professional services", *Journal of Service Research*, Vol. 24 No. 1, pp. 122-140.
- Suseno, Y., Chang, C., Hudik, M. and Fang, E.S. (2023), "Beliefs, anxiety and change readiness for artificial intelligence adoption among human resource managers: the moderating role of high-performance work systems", in *Artificial Intelligence and International HRM*, Routledge, London, pp. 144-171.
- Theis, S., Jentzsch, S., Deligiannaki, F., Berro, C., Raulf, A.P. and Bruder, C. (2023), "Requirements for explainability and acceptance of artificial intelligence in collaborative work", in *Proceedings of the International Conference on Human-Computer Interaction*, Springer Nature Switzerland, Cham, pp. 355-380.
- Tursunbayeva, A. and Renkema, M. (2023), "Artificial intelligence in health-care: implications for the job design of healthcare professionals", *Asia Pacific Journal of Human Resources*, Vol. 61 No. 4, pp. 845-887.
- Van Eck, N.J. and Waltman, L. (2017), "Citation-based clustering of publications using CitNetExplorer and VOSviewer", *Scientometrics*, Vol. 111, pp. 1053-1070.
- Verma, S. and Singh, V. (2022), "Impact of artificial intelligence-enabled job characteristics and perceived substitution crisis on innovative work behavior of employees from high-tech firms", *Computers in Human Behavior*, Vol. 131, 107215.
- Wang, B., Liu, Y. and Parker, S.K. (2020), "How does the use of information communication technology affect individuals? A work design perspective", *Academy of Management Annals*, Vol. 14 No. 2, pp. 695-725.
- Wang, X., Lin, X. and Shao, B. (2023), "Artificial intelligence changes the way we work: a close look at innovating with chatbots", *Journal of the Association for Information Science and Technology*, Vol. 74 No. 3, pp. 339-353.
- Wilkens, U. (2020), "Artificial intelligence in the workplace—a double-edged sword", *The International Journal of Information and Learning Technology*, Vol. 37 No. 5, pp. 253-265.
- Zhang, F. and Parker, S.K. (2023), "How ChatGPT can and can't help managers design better job roles", *MIT Sloan Management Review*, Vol. 65 No. 1, pp. 1-5.
- Zupic, I. and Čater, T. (2015), "Bibliometric methods in management and organization", *Organizational Research Methods*, Vol. 18 No. 3, pp. 429-472.