



HAL
open science

A SCOPING REVIEW AT THE INTERTWINING OF MINIMAL RESOURCE CONSUMPTION AND DIGITAL PHENOMENA

Hajer Aloulou, Claudio Vitari, Zouhour Smaoui Hachicha

► **To cite this version:**

Hajer Aloulou, Claudio Vitari, Zouhour Smaoui Hachicha. A SCOPING REVIEW AT THE INTERTWINING OF MINIMAL RESOURCE CONSUMPTION AND DIGITAL PHENOMENA. The 16th Mediterranean Conference on Information Systems (MCIS), Oct 2024, Porto, Portugal. hal-04875479

HAL Id: hal-04875479

<https://hal.science/hal-04875479v1>

Submitted on 8 Jan 2025

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - ShareAlike 4.0 International License

Title: A SCOPING REVIEW AT THE INTERTWINING OF MINIMAL RESOURCE CONSUMPTION AND DIGITAL PHENOMENA

Research in progress

Hajer Aloulou, Aix Marseille Univ, CERGAM, FEG, Aix-en-Provence-France and University of Sfax, PRISME, FSEG, Sfax- Tunisia hajer.aloulou@univ-amu.fr

Claudio Vitari, Aix Marseille Univ, CERGAM, FEG, Aix-en-Provence-France claudio.vitari@univ-amu.fr

Zouhour Smaoui Hachicha, Al Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia PRISME, University of Sfax, Tunisia zmalsamawi@imamu.edu.sa

➤ Abstract

There is a rapid and extensive progress in digital technologies and organizations need resources to build a successful path. Frugal solutions help companies to make economical digital investment which could be called frugal digitalization. This study examines the scope of frugal digitalization by synthesizing the existing articles that combine digital and minimal resource consumption. Therefore, a scoping review is conducted, and 59 articles are finally included. The result revealed that frugality, bricolage, jugaad, and moderation are the close concepts used to represent the minimal resource consumption. The study's results indicate that digitalization, digital transformation, digital orientation, and information communication technologies (ICT) adoption are the close concepts used to represent the digital phenomenon. These concepts can intertwine and establish connections between them. This study contributes to the literature by identifying the most often used concepts that reflect the digital era and the economical approach. Furthermore, this study offers practical implications: it validates the existing intersection in the business world and motivates professionals to go further in such a way. We conclude by outlining the next steps for the matrix, which will show how minimal resource consumption connects with the three stages of digital transformation—digitization, digitalization, and digital transformation.

Key words: digitalization, frugality, frugal digitalization, scoping review.



➤ References

- Agarwal, N., Grottke, M., Mishra, S., and Brem, A. 2017. "A Systematic Literature Review of Constraint-Based Innovations: State of the Art and Future Perspectives," *IEEE Transactions on Engineering Management* (64:1), pp. 3–15. (<https://doi.org/10.1109/TEM.2016.2620562>).
- Ahuja, S., and Chan, Y. 2019. *Frugal Innovation and Digitalisation*, in (In Frugal Innovation.), pp. 89–107. (<https://doi.org/10.4324/9780429025679-5>).
- Anwar, M., and Shah, S. Z. A. 2021. "Entrepreneurial Orientation and Generic Competitive Strategies for Emerging SMEs: Financial and NONFINANCIAL Performance Perspective," *Journal of Public Affairs* (21:1), p. e2125. (<https://doi.org/10.1002/pa.2125>).
- Arksey, H., and O'Malley, L. 2005. "Scoping Studies: Towards a Methodological Framework," *International Journal of Social Research Methodology* (8:1), pp. 19–32. (<https://doi.org/10.1080/1364557032000119616>).
- Bååth, J. 2022. "How Alternative Foods Become Affordable: The Co-Construction of Economic Value on a Direct-to-Customer Market," *Journal of Rural Studies* (94), pp. 63–72. (<https://doi.org/10.1016/j.jrurstud.2022.05.017>).
- Basu, R. R., Banerjee, P. M., and Sweeny, E. G. 2013. "Frugal Innovation: Core Competencies to Address Global Sustainability," *Journal of Management for Global Sustainability* (1:2), pp. 63–82. (<https://doi.org/10.13185/JM2013.01204>).
- Bauer, D., Schumacher, S., Gust, A., Seidelmann, J., and Bauernhansl, T. 2019. "Characterization of Autonomous Production by a Stage Model," *Procedia CIRP* (81), 52nd CIRP Conference on Manufacturing Systems (CMS), Ljubljana, Slovenia, June 12-14, 2019, pp. 192–197. (<https://doi.org/10.1016/j.procir.2019.03.034>).
- Bauwens, T., Hekkert, M., and Kirchherr, J. 2020. "Circular Futures: What Will They Look Like?," *Ecological Economics* (175), p. 106703. (<https://doi.org/10.1016/j.ecolecon.2020.106703>).
- Betti, N., Sarens, G., and Poncin, I. 2021. "Effects of Digitalisation of Organisations on Internal Audit Activities and Practices," *Managerial Auditing Journal* (36:6), Emerald Publishing Limited, pp. 872–888. (<https://doi.org/10.1108/MAJ-08-2020-2792>).
- Bouayad, L., Padmanabhan, B., and Chari, K. 2020. "Can Recommender Systems Reduce Healthcare Costs? The Role of Time Pressure and Cost Transparency in Prescription Choice," *MIS Quarterly* (44:4), MIS Quarterly, pp. 1859–1902. (<https://doi.org/10.25300/MISQ/2020/14435>).
- Busch, C., and Barkema, H. 2021. "From Necessity to Opportunity: Scaling Bricolage across Resource-Constrained Environments," *Strategic Management Journal* (42:4), John Wiley & Sons, Ltd, pp. 741–773. (<https://doi.org/10.1002/smj.3237>).
- Colledani, M., Silipo, L., Yemane, A., Lanza, G., Bürgin, J., Hochdörffer, J., Georgoulas, K., Mourtzis, D., Bitte, F., Bernard, A., and Belkadi, F. 2016. "Technology-Based Product-Services for Supporting Frugal Innovation," *Procedia CIRP* (47), Product-Service Systems across Life Cycle, pp. 126–131. (<https://doi.org/10.1016/j.procir.2016.03.093>).
- Corsini, L., Dammico, V., and Moultrie, J. 2021. "Frugal Innovation in a Crisis: The Digital Fabrication Maker Response to COVID-19," *R&D Management* (51:2), pp. 195–210. (<https://doi.org/10.1111/radm.12446>).
- Cruz, R. L. J., Ross, M. T., Nightingale, R., Pickering, E., Allenby, M. C., Woodruff, M. A., and Powell, S. K. 2023. "An Automated Parametric Ear Model to Improve Frugal 3D Scanning Methods for the Advanced Manufacturing of High-Quality Prosthetic Ears," *Computers in Biology and Medicine* (162), p. 107033. (<https://doi.org/10.1016/j.combiomed.2023.107033>).
- Cuevas-Vargas, H., Parga-Montoya, N., and Fernández-Escobedo, R. 2022. "The Adoption of ICT as an Enabler of Frugal Innovation to Achieve Customer Satisfaction. The Mediating Effect of Frugal Innovation," *Procedia Computer Science* (199), The 8th International Conference on Information Technology and Quantitative Management (ITQM 2020 & 2021): Developing Global Digital Economy after COVID-19, pp. 198–206. (<https://doi.org/10.1016/j.procs.2022.01.025>).
- Dissemination, U. of Y. N. C. for R. &. 2001. *Undertaking Systematic Reviews of Research on Effectiveness: CRD's Guidance for Those Carrying Out Or Commissioning Reviews*, Centre for Reviews and Dissemination, University of York.

- Drolet, A., Luce, M. F., Jiang, L., Rossi, B. C., and Hastie, R. 2021. “The Preference for Moderation Scale,” *Journal of Consumer Research* (47:6), Oxford University Press / USA, pp. 831–854. (<https://doi.org/10.1093/jcr/ucaa042>).
- Essen, A., Frishammar, J., and Cenamor, J. 2023. “Entering Non-Platformized Sectors: The Co-Evolution of Legitimacy Debates and Platform Business Models in Digital Health Care,” *Technovation* (121), p. 102597. (<https://doi.org/10.1016/j.technovation.2022.102597>).
- Fransen, J., Hati, B., Nyumba, R., and van Tuijl, E. 2023. “Community Vitality and Frugal Practices in Informal Settlements in Nairobi: Towards a Typology,” *Cities* (134), Elsevier, p. 104179.
- Garud, R., and Karnøe, P. 2003. “Bricolage versus Breakthrough: Distributed and Embedded Agency in Technology Entrepreneurship,” *Research Policy* (32:2), Elsevier, pp. 277–300.
- Hossain, M., Agarwal, N., Bhatti, Y., and Levänen, J. 2022. “Frugal Innovation: Antecedents, Mediators, and Consequences,” *Creativity and Innovation Management* (31:3), pp. 521–540. (<https://doi.org/10.1111/caim.12511>).
- Hossain, M., Park, S., and Shahid, S. 2023. “Frugal Innovation for Sustainable Rural Development,” *Technological Forecasting and Social Change* (193), p. 122662. (<https://doi.org/10.1016/j.techfore.2023.122662>).
- Jiraphanumes, K., Aujirapongpan, S., and Songkajorn, Y. 2023. “Influence of Diagnostic and Dynamic Capabilities on Frugal Innovation Development: An Empirical Study of the Thai Auto Parts Industry,” *Asia Pacific Management Review* (28:2), pp. 229–239. (<https://doi.org/10.1016/j.apmr.2022.10.001>).
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., and Buckley, N. 2015. “Strategy, Not Technology, Drives Digital Transformation,” *MIT Sloan Management Review*.
- Khanal, P. B., Aubert, B. A., Bernard, J.-G., Narasimhamurthy, R., and Dé, R. 2022. “Frugal Innovation and Digital Effectuation for Development: The Case of Lucia,” *Information Technology for Development* (28:1), Taylor & Francis Ltd, pp. 81–110. (<https://doi.org/10.1080/02681102.2021.1920874>).
- Konrad, K., and Wangler, L. U. 2018. “Tailor-Made Technology: The Stretch of Frugal Innovation in the Truck Industry,” *Procedia Manufacturing* (19), Proceedings of the 6th International Conference in Through-Life Engineering Services, University of Bremen, 7th and 8th November 2017, pp. 10–17. (<https://doi.org/10.1016/j.promfg.2018.01.003>).
- Korherr, P., Kanbach, D. K., Kraus, S., and Mikalef, P. 2022. “From Intuitive to Data-Driven Decision-Making in Digital Transformation: A Framework of Prevalent Managerial Archetypes,” *Digital Business* (2:2), p. 100045. (<https://doi.org/10.1016/j.digbus.2022.100045>).
- Kraaij, A., Swakhoven, A., and Poldner, K. (n.d.). *Design-Thinking & Frugality; A Workshop Routine to Capture the Value of Innovations for SMEs*. (https://www.academia.edu/download/97739486/Revised_version_KRAAIJSWAKHOVENP_OLDNER.pdf).
- Kraaij, A., Swakhoven, A., and Poldner, K. (n.d.). *Design-Thinking & Frugality; A Workshop Routine to Capture the Value of Innovations for SMEs*. (https://www.academia.edu/download/97739486/Revised_version_KRAAIJSWAKHOVENP_OLDNER.pdf).
- Lastovicka, J. L., Bettencourt, L. A., Shaw Hughner, R., and Kuntze, R. J. 1999. “Lifestyle of the Tight and Frugal: Theory and Measurement,” *Journal of Consumer Research* (26:1), Oxford University Press / USA, pp. 85–98. (<https://doi.org/10.1086/209552>).
- Levac, D., Colquhoun, H., and O’Brien, K. K. 2010. “Scoping Studies: Advancing the Methodology,” *Implementation Science* (5:1), p. 69. (<https://doi.org/10.1186/1748-5908-5-69>).
- Low, M. P., and Bu, M. 2022. “Examining the Impetus for Internal CSR Practices with Digitalization Strategy in the Service Industry during COVID-19 Pandemic,” *Business Ethics, the Environment & Responsibility (Print)* (31:1), Wiley, pp. 209–223. (<https://doi.org/10.1111/beer.12408>).
- Malshe, A. P., Bapat, S., Rajurkar, K. P., Liu, A., and Linares, J.-M. 2023. “Exploring the Intersection of Biology and Design for Product Innovations,” *CIRP Annals* (72:2), pp. 569–592. (<https://doi.org/10.1016/j.cirp.2023.05.004>).
- Mourtzis, D., Synodinos, G., Angelopoulos, J., and Panopoulos, N. 2020. “An Augmented Reality Application for Robotic Cell Customization,” *Procedia CIRP* (90), 27th CIRP Life Cycle

- Engineering Conference (LCE2020) Advancing Life Cycle Engineering : From Technological Eco-Efficiency to Technology That Supports a World That Meets the Development Goals and the Absolute Sustainability, pp. 654–659. (<https://doi.org/10.1016/j.procir.2020.02.135>).
- Mourtzis, D., Vlachou, E., Giannoulis, C., Siganakis, E., and Zogopoulos, V. 2016. “Applications for Frugal Product Customization and Design of Manufacturing Networks,” *Procedia CIRP* (52), The Sixth International Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV2016), pp. 228–233. (<https://doi.org/10.1016/j.procir.2016.07.055>).
- Mundel, J., Soopramanien, D., and Huddleston, P. 2021. “Affordable Luxuries: Comparing American and Chinese Millennial Consumers,” *Asia Pacific Management Review* (26:4), pp. 215–225. (<https://doi.org/10.1016/j.apmr.2021.02.003>).
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., and Aromataris, E. 2018. “Systematic Review or Scoping Review? Guidance for Authors When Choosing between a Systematic or Scoping Review Approach,” *BMC Medical Research Methodology* (18:1), p. 143. (<https://doi.org/10.1186/s12874-018-0611-x>).
- Okoli, C. 2015. “A Guide to Conducting a Standalone Systematic Literature Review,” *Communications of the Association for Information Systems* (37:1), p. 43.
- Okuda, S., and Uchihira, N. 2023. *Digital Transformation Classification Types and Evolution Process for Established Companies*, , July 22. (<https://doi.org/10.54941/ahfe1003124>).
- “Oxford Dictionary.” 2017. , September 1. (<https://en.oxforddictionaries.com/definition/frugal>).
- Park, S., Rosca, E., and Agarwal, N. 2022. “Driving Social Impact at the Bottom of the Pyramid through the Internet-of-Things Enabled Frugal Innovations,” *Technovation* (118), N.PAG-N.PAG. (<https://doi.org/10.1016/j.technovation.2021.102381>).
- Ratten, V. 2023. “Entrepreneurship: Definitions, Opportunities, Challenges, and Future Directions,” *Global Business and Organizational Excellence* (42:5), John Wiley & Sons, Ltd, pp. 79–90. (<https://doi.org/10.1002/joe.22217>).
- Ritchie, H. A. 2022. “An Institutional Perspective to Bridging the Divide: The Case of Somali Women Refugees Fostering Digital Inclusion in the Volatile Context of Urban Kenya,” *New Media & Society* (24:2), SAGE Publications, pp. 345–364. (<https://doi.org/10.1177/14614448211063186>).
- Roiland, D. 2016. “Frugality, A Positive Principle to Promote Sustainable Development,” *Journal of Agricultural & Environmental Ethics* (29:4), Springer Nature, pp. 571–585. (<https://doi.org/10.1007/s10806-016-9619-6>).
- Schildt, H. 2022. “The Institutional Logic of Digitalization,” in *Digital Transformation and Institutional Theory* (Vol. 83), Research in the Sociology of Organizations, T. Gegenhuber, D. Logue, C. R. (Bob) Hinings, and M. Barrett (eds.), Emerald Publishing Limited, pp. 235–251. (<https://doi.org/10.1108/S0733-558X20220000083010>).
- Schlag, M., Rocchi, M., and Turnbull, R. 2023. “Adam Smith’s Virtue of Prudence in E-Commerce: A Conceptual Framework for Users in the E-Commercial Society,” *Business & Society*, SAGE Publications Inc, p. 00076503231206735. (<https://doi.org/10.1177/00076503231206735>).
- Schleinkofer, U., Moz, D., Bauernhansl, T., and Lang, A. 2019. “Knowledge Acquisition in Product Planning of Frugal Manufacturing Systems for Emerging Markets,” *Procedia CIRP* (81), 52nd CIRP Conference on Manufacturing Systems (CMS), Ljubljana, Slovenia, June 12-14, 2019, pp. 246–251. (<https://doi.org/10.1016/j.procir.2019.03.043>).
- Sekhsaria, P. 2013. “The Making of an Indigenous STM: Technological Jugaad as a Culture of Innovation in India,” *Shaping Emerging Technologies: Governance, Innovation, Discourse* (137152), Ios Press. (https://www.academia.edu/download/32300825/11_Sekhsaria.pdf).
- Shahid, M. S., Hossain, M., Shahid, S., and Anwar, T. 2023. “Frugal Innovation as a Source of Sustainable Entrepreneurship to Tackle Social and Environmental Challenges,” *Journal of Cleaner Production* (406), p. 137050. (<https://doi.org/10.1016/j.jclepro.2023.137050>).
- Shelton, T. 2007. “Frugality and Robustness: Negotiating Economy and Ecology in Architecture,” *Journal of Green Building* (2:1), pp. 107–118. (<https://doi.org/10.3992/jgb.2.1.107>).
- Shepherd, D. A., Parida, V., and Wincent, J. 2020. “The Surprising Duality of Jugaad: Low Firm Growth and High Inclusive Growth,” *Journal of Management Studies* (57:1), John Wiley & Sons, Ltd, pp. 87–128. (<https://doi.org/10.1111/joms.12309>).

- Stocchi, L., Pourazad, N., Michaelidou, N., Tanusondjaja, A., and Harrigan, P. 2021. "Marketing Research on Mobile Apps: Past, Present and Future," *Journal of the Academy of Marketing Science*, Springer Nature, pp. 1–31. (<https://doi.org/10.1007/s11747-021-00815-w>).
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., and Haenlein, M. 2021. "Digital Transformation: A Multidisciplinary Reflection and Research Agenda," *Journal of Business Research* (122), pp. 889–901. (<https://doi.org/10.1016/j.jbusres.2019.09.022>).
- Vizcaíno, F. V., Martín, S. L., Cardenas, J. J., and Cardenas, M. 2021. "Employees' Attitudes toward Corporate Social Responsibility Programs: The Influence of Corporate Frugality and Polychronicity Organizational Capabilities," *Journal of Business Research* (124), Elsevier, pp. 538–546.
- Webster, J., and Watson, R. T. 2002. "Analyzing the Past to Prepare for the Future: Writing a Literature Review," *MIS Quarterly*, JSTOR, pp. xiii–xxiii.
- Wirtz, J., and Zeithaml, V. 2018. "Cost-Effective Service Excellence," *Journal of the Academy of Marketing Science* (46:1), Springer Nature, pp. 59–80. (<https://doi.org/10.1007/s11747-017-0560-7>).
- Yoon, H. J. 2017. "Motivating Savings Behavior With Public Service Advertisements: Using Social Norms and Benefit Information to Encourage Savings," *Journal of Nonprofit & Public Sector Marketing* (29:2), Taylor & Francis Ltd, pp. 148–168. (<https://doi.org/10.1080/10495142.2017.1326339>).
- Yousaf, Z., Radulescu, M., Sinisi, C. I., Serbanescu, L., and Păunescu, L. M. 2021. "Towards Sustainable Digital Innovation of SMEs from the Developing Countries in the Context of the Digital Economy and Frugal Environment," *Sustainability* (13:10), Multidisciplinary Digital Publishing Institute, p. 5715. (<https://doi.org/10.3390/su13105715>).
- Zhang, X. 2018. "Frugal Innovation and the Digital Divide: Developing an Extended Model of the Diffusion of Innovations," *International Journal of Innovation Studies* (2:2), pp. 53–64. (<https://doi.org/10.1016/j.ijis.2018.06.001>).
- Zuckerman, E. W. 2012. "Construction, Concentration, and (Dis)Continuities in Social Valuations," *Annual Review of Sociology* (38:1), pp. 223–245. (<https://doi.org/10.1146/annurev-soc-070210-075241>).