



ERCIM "ALAIN BENSOUSSAN"
FELLOWSHIP PROGRAMME



Scientific Report

First name / Family name

Cristina Trocin

Nationality

Italian

Name of the *Host Organisation*

Norwegian University of Science and
Technology (NTNU)

First Name / family name
of the *Scientific Coordinator*

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Period of the fellowship

01/08/2020 to 31/07/2022

I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

Artificial Intelligence (AI) is radically changing the modus operandi in which experts create knowledge and how it is managed (Benbya et al. 2021; Lebovitz et al. 2021; Strich et al. 2021). Consequently, experts are eager to understand the inner logics and processes of AI technology as their expertise and skills are developed in relation to the ongoing use of such technology (Anthony 2021; Hadjimichael and Tsoukas 2019). A focus on this aspect is particularly important in the development of AI technology, where the combination of expert and artificial knowing in practice is critical and constantly challenging. However, the nature of the changes driven by AI differs from those triggered by traditional information technologies since AI takes over complex reasoning and analysis tasks, shifting the locus of agency from exclusive dominance of humans to machines, affecting our understanding of how humans and machines interact and offering fresh thinking opportunities (Lebovitz et al. 2021; Rai et al. 2019).

Despite our fascination with AI capabilities, our understanding of how healthcare experts construct knowledge in the age of intelligent machines remains limited. This presents several challenges when it comes to the ways AI technology is developed and how AI is

actually employed to create healthcare expert knowledge in practice. To better support medical work, it is crucial to understand the computational biography of the algorithms. Therefore, this study aims to investigate the nested algorithmic assemblages for automating tasks, enacting roles, fostering expertise, and performing calculations (Glaser et al. 2021) by focusing on the materialisations of logics, goals, and intentions embedded in AI itself, which are the core aspects of the novel approaches for knowledge creation. In doing so, we update existing theoretical insights with empirically grounded studies on AI development and respond to recent calls on how AI technology impacts knowledge management (Glaser et al. 2021; Lebovitz et al. 2021; Murray et al. 2020) by addressing how expert knowledge is inscribed into AI technology and how this impacts on the performance of tasks in healthcare.

We conducted a qualitative study in the Operating Room of the Future in Norway and interviewed key actors that actively contributed to the development phase of AI such as doctors, AI developers and healthcare professionals. We collected 32 semi structured interviews, approximately 30 papers published by our informants. Gioia methodology guided data analysis along three-order analysis to capture informants' perspectives, to extract concepts and relationships emerging from the informants to aggregate key dimensions for describing and interpreting the phenomenon (Gioia et al. 2013).

In addition, we prepared the application and submitted it to Marie Curie Program two times. We received good scores, but the project was not selected and funded. During the project, I co-supervised with Prof. Mikalef two master students.

References

- Anthony, C. 2021. "When Knowledge Work and Analytical Technologies Collide: The Practices and Consequences of Black Boxing Algorithmic Technologies," *Administrative Science Quarterly*, SAGE Publications Inc, p. 00018392211016755. (<https://doi.org/10.1177/00018392211016755>).
- Benbya, H., Pachidi, S., and Jarvenpaa, S. L. 2021. "Special Issue Editorial: Artificial Intelligence in Organizations: Implications for Information Systems Research," *Journal of the Association for Information Systems* (22:2), pp. 281–303.
- Gioia, D. A., Corley, K. G., and Hamilton, A. L. 2013. "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology," *Organizational Research Methods* (16:1), pp. 15–31. (<https://doi.org/10.1177/1094428112452151>).
- Glaser, V. L., Pollock, N., and D'Adderio, L. 2021. "The Biography of an Algorithm: Performing Algorithmic Technologies in Organizations," *Organization Theory* (2:2), SAGE Publications Ltd, p. 26317877211004610. (<https://doi.org/10.1177/26317877211004609>).
- Hadjimichael, D., and Tsoukas, H. 2019. "Toward a Better Understanding of Tacit Knowledge in Organizations: Taking Stock and Moving Forward," *Academy of*

Management Annals (13:2), pp. 672–703.
(<https://doi.org/10.5465/annals.2017.0084>).

Lebovitz, S., Levina, N., and Lifshitz-Assaf, H. 2021. “Is AI Ground Truth Really ‘True’? The Dangers of Training and Evaluating AI Tools Based on Experts’ Know-What,” *Management Information Systems Quarterly*.

Murray, A., Rhymer, J., and Sirmon, D. 2020. “Humans and Technology: Forms of Conjoined Agency in Organizations,” *Academy of Management Review*.
(<https://doi.org/10.5465/amr.2019.0186>).

Rai, A., Constantinides, P., and Sarker, S. 2019. “Next Generation Digital Platforms:: Toward Human-AI Hybrids,” *Mis Quarterly* (43:1), University of Minnesota, pp. iii–ix.

Strich, F., Mayer, A.-S., and Fiedler, M. 2021. “What Do I Do in a World of Artificial Intelligence? Investigating the Impact of Substitutive Decision-Making AI Systems on Employees’ Professional Role Identity,” *Journal of the Association for Information Systems* (22:2), pp. 304–324.

II – PUBLICATION(S) DURING YOUR FELLOWSHIP

Trocin, C., Skogås, J. G., Langø, T., & Kiss, G. H. (2022). Operating Room of the Future (FOR) Digital Healthcare Transformation in the Age of Artificial Intelligence. Digital Transformation in Norwegian Enterprises, 151.

Trocin, C., Hovland, I., Mikalef, P., & Dremel, C. (2021). How Artificial Intelligence affords digital innovation: A cross-case analysis of Scandinavian companies. *Technological Forecasting and Social Change*, 173, 121081.

Trocin, C., Mikalef, P., Papamitsiou, Z., & Conboy, K. (2021). Responsible AI for Digital Health: A Synthesis and a Research Agenda. *Information Systems Frontiers*, 1-19.

Working Papers

Trocin, C., Stige, A., Mikalef, P., (2022). The pre-adoption phase of Machine Learning (ML) in the Design Process: A Study of Norwegian Design Consultancies. Under review – *Information and Management*.

Trocin, C., Mikalef, M., Wang, Y., & Bernardi, R. (2021). The development process of AI technology in healthcare: An Algorithmic Assemblages Perspective. *The Journal of the Association for Information Systems*.

III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

2022 - MISQ Scholarly Development Academy - Exploring Knowledgeability of Human-AI Hybrids in Healthcare: An Algorithmic Assemblages Perspective

2022 - Ivey Business School: Advancing Management & Organization Studies International Symposium

2022 - Informatics Europe - Online Academic Leadership Development Course

2021 - Norwegian Informatics Conference (NIK) – Trondheim

2021 - kick-off webinar for COMPAMA - Artificial Intelligence in healthcare and Human Resource Management: evidence from Scandinavian organizations

2021 - International Conference on Information Systems (ICIS) – Workshop Changing Nature of Work - Exploring Knowledgeability of Human-AI Hybrids in Healthcare: An Algorithmic Assemblages Perspective

2021 - Academy of Management – Junior Faculty Consortium

2021 - ERCIM Community Event - Artificial Intelligence Technology for Digital Innovation and Medical Decision Making

2021 - Warwick Summer School on Practice and Process Studies - Virtual Summer School

2020 - AOM - OCIS business meeting

IV – RESEARCH EXCHANGE PROGRAMME (REP)

The Research Exchange Programme was conducted at the Information and Decision Support Systems Lab of INESC-ID with Prof. Elsa Cardoso. The following activities were carried out:

-Interview protocol and collection of semi-structured interviews with key actors at Champalimaud Foundation – Breast cancer unit

-Visit Champalimaud Foundation – Breast cancer unit

-Interviews analysis

-Preparation of a paper for the European Conference on Information Systems (ECIS)