The 3-Ellipse Model: A Lens for Understanding Generative AI's Impact on Organisations

Mercy Williams, Jon G. Hall, Lucia Rapanotti, Khadija Tahera

The Open University, UK

AI4X / IARIA Conference 2025

Presented by: Mercy Williams
The Open University
mercy.williams@open.ac.uk

About the Presenter

My name is Mercy Williams.

I am a first-year PhD student at The Open University, within the School of Computing and Communications.

My research centres on organisational change, problem orientation, and the adoption of Generative AI (GenAI) in socio-technical systems.

I am especially interested in how emerging technologies foster strategic transformation, reshape organisational workflows, and impact decision-making processes.

Abstract

- Rapid proliferation of Generative Artificial Intelligence (GenAI) is driving significant change across sectors.
- Understanding GenAI's multifaceted impact on organisational structures, processes, and workforce skills is crucial.

Proposed Framework:

- This idea paper proposes an integrated framework—an extant problem-oriented model called the 3-Ellipse Model combined with three GenAI agency modes (Reactive, Responsive, Driving)—to understand GenAI's transformative impact on organisations.

Purpose - To provide a robust analytical framework to comprehend the unfolding trajectory of this change.

Contribution - Early indication of how this framework can analyse GenAI-driven organisational change.

Research Context

The GenAI Transformation Challenge

Dual Impact

GenAI serves as both productivity accelerator and disruptive force across sectors (Manresa et al., 2024; Rudolph et al., 2024)

Workforce Implications

Tasks and skills of could be substantially replaced (Cazzaniga *et al.*, 2024; Mukherjee and Dutta, 2025)

Analytical Gap

We lack sound analytical tools to understand and predict the broader ramifications of GenAI's impact on organisations.

Theoretical Foundation

The 3-Ellipse Model

(Hall and Rapanotti, 2017)

Organisation as a Socio-Technical System

Environment (Problem Space)

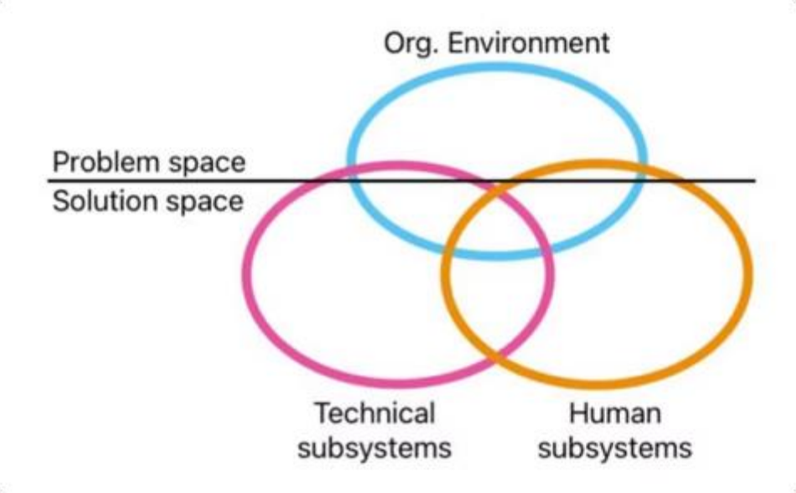
External stakeholders, their contexts, perceived needs, and validation criteria

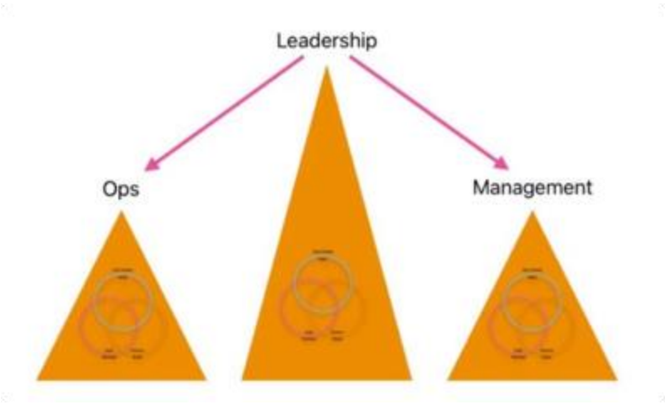
Human Subsystems

People, protocols, processes, interactions, skills, knowledge, collaborations

Technical Subsystems

All technology and infrastructure used by the organisation





Problem-Solving Delegation

Organisational problem-solving occurs across and down the organisation through delegation structures, from strategic leadership to operational functions.

Problem solving happens through sharing of real-world phenomena across boundaries, including products, services, and data

GenAI as a Catalyst for Change

Expanding Technical Subsystems

Organisations leverage GenAI to significantly expand their technical capabilities and infrastructure (Fui-Hoon Nah et al., 2023; Hendricks, 2023; Law, 2024; Brynjolfsson, Li and Raymond, 2025; Corvello, 2025).

Rethinking Human Roles & Structures

This expansion often leads to a re-evaluation of human subsystem roles and a fundamental rethinking of existing organisational structures (Şahin and Karayel, 2024; Li and Lewis, 2025; Satyadhar Joshi, 2025).

GenAI Agency Modes

Three Modes of Organisational Change

Three GenAI Agency Modes

Reactive Agency

Augmenting human teams with GenAI for solution exploration in organisational change

Focus: Understanding how AI is currently altering organisational dynamics

Responsive Agency

Replacing human teams with GenAI for solution exploration, analysing social-technical interplay

Focus: Organisational restructuring and evolving relationships

Driving Agency

Using GenAI agents as tools for generation and evaluation of change scenarios

Focus: Proactively identifying potential changes before they occur

Mode 1

Reactive Agency

Human-AI Interface

Focus on evolving relationship between people and AI systems

Current Dynamics

Understanding how AI is presently altering organisational structures

Augmentation Focus

Enhancing human capabilities rather than replacement

Mode 2

Responsive Agency

Replacement Model

Analysing potential for human team replacement with GenAI systems

Structural Shifts

Examining organisational restructuring from GenAI integration at various levels

Relationship Evolution

Understanding changing dynamics between strategic leadership and operations

Mode 3

Driving Agency

Proactive Identification

GenAI proactively identifies and assesses potential organisational changes before they occur

Scenario Generation

Generating and reviewing scenarios for organisational change, evaluating impact and viability

Strategic Advantage

- More forward-looking strategic planning
- Data-driven comprehensive analysis
- Enhanced decision-making processes
- Optimised resource allocation

Reminiscent of traditional SWOT and PEST analyses, but with GenAI generating scenarios for human stakeholder consideration

Proposed Integrated Framework Applications

Current Analysis

Structured lens for examining present GenAI-induced organisational shifts

Near-Future Prediction

Anticipating upcoming changes in organisational structures and processes

Long-term Speculation

Exploring potential transformation mechanisms and strategic implications

> The framework provides practical tools for GenAI-driven organisational transformations in both problem and solution spaces

Conclusion

Future Research Directions

Key Contributions & Next Steps

1

Framework Development

Three GenAI agency modes informed by 3-ellipse model

2

Analytical Tools

Structured approach to understanding GenAI-driven change

3

Future Validation

Real-world case studies to develop and evaluate framework

This theoretical framework may provide practical tools for both problem and solution spaces in GenAI-driven organisational transformations.

Citations

•Brynjolfsson, E., Li, D. and Raymond, L. (2025) 'Generative AI at Work', *The Quarterly Journal of Economics*, p. qjae044. Available at: https://doi.org/10.1093/qje/qjae044.

•Cazzaniga, M. et al. (2024) Gen-AI: Artificial Intelligence and the Future of Work. International Monetary Fund.

•Corvello, V. (2025) 'Generative AI and the future of innovation management: A human centered perspective and an agenda for future research', *Journal of Open Innovation: Technology, Market, and Complexity*, 11(1), p. 100456. Available at: https://doi.org/10.1016/j.joitmc.2024.100456.

•Fui-Hoon Nah, F. *et al.* (2023) 'Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration', *Journal of Information Technology Case and Application Research*, 25(3), pp. 277–304. Available at: https://doi.org/10.1080/15228053.2023.2233814.

•Hall, J.G. and Rapanotti, L. (2017) 'A design theory for software engineering', *Information and Software Technology*, 87, pp. 46–61. Available at: https://doi.org/10.1016/j.infsof.2017.01.010.

•Hendricks, F. (2023) 'Business value of Generative AI use cases', *Journal of AI, Robotics & Workplace Automation*, 3(1), p. 47. Available at: https://doi.org/10.69554/JIUO9062.

•Law, L. (2024) 'Application of generative artificial intelligence (GenAI) in language teaching and learning: A scoping literature review', *Computers and Education Open*, 6, p. 100174. Available at: https://doi.org/10.1016/j.caeo.2024.100174.

•Li, F. and Lewis, H. (2025) 'Transforming organizations through AI: Emerging strategies for navigating the future of business'.

•Manresa, A. *et al.* (2024) 'Humanizing GenAI at work: bridging the gap between technological innovation and employee engagement', *Journal of Managerial Psychology* [Preprint]. Available at: https://doi.org/10.1108/JMP-05-2024-0356.

•Mukherjee, P. and Dutta, S. (2025) 'When Generative Artificial Intelligence Enhances the Quality of Human Output: WorkplaceImplications', SSRN Electronic Journal [Preprint]. Available at: https://doi.org/10.2139/ssrn.5097793.

•Rudolph, J., Mohamed Ismail, F.M. and Popenici, S. (2024) 'Higher Education's Generative Artificial Intelligence Paradox: The Meaning of Chatbot Mania', *Journal of University Teaching and Learning Practice*, 21(06). Available at: https://doi.org/10.53761/54fs5e77.

•Şahin, O. and Karayel, D. (2024) 'Generative Artificial Intelligence (GenAI) in Business: A Systematic Review on the Threshdd of Transformation', *Journal of Smart Systems Research*, 5(2), pp. 156–175. Available at: https://doi.org/10.58769/joinssr.1597110.

•Satyadhar Joshi (2025) 'Generative AI: Mitigating Workforce and Economic Disruptions While Strategizing Policy Responses forGovernments and Companies', *International Journal of Advanced Research in Science, Communication and Technology*, pp. 480–486. Available at: https://doi.org/10.48175/IJARSCT-23260.

•Williams, M. *et al.* (2025) 'The 3-Ellipse Model: A Lens for Understanding Generative AI's Impact on Organisations'.