Deciding to Implement Emerging Technologies

The Use of Digital Technologies in Planning for the Implementation of Robotics and Autonomous Systems (RAS) in Food Manufacturing Firms

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Background

Growing need for investment in RAS for food manufacturing firms.

Technology investment decisions often occur before uncertainties are resolved [2].

Visualisations can aid knowledge integration between stakeholders.

Novel digital technologies could help.

The sector faces permanent shrinkage from acute labour shortages [1].

ROI?
Technology readiness?
Future business environment?

Integrating different perspectives can mitigate uncertainty [3].

Visual artefacts can enable knowledge transformation across boundaries between business functions [4].

Mixed reality technologies offer new opportunities for visualising, and interacting with, information.

Aim and Objectives

Aim: Improve the integration of different perspectives in technology management decisions.

Objective 1: Identify how visual artefacts are used to integrate different perspectives and the associated challenges.

Objective 2: Develop (and validate) a map of affordances of digital technologies to overcome the identified challenges.

Objective 3: Design a tool using digital technologies to target a specific integration challenge. Test on implementation decisions about RAS in food manufacturing.

Expected Outputs

Academic Contribution	Industry Application
Literature review about boundary objects in technology management decision-making	**Guidelines** for the **design of tools** using AR / VR in technology management decision-making
Map of affordances of visual tools for integrating multiple perspectives in decision-making	**Application of tool** to a decision-making process about RAS in food manufacturing with industry partner

Approach

Investigate the use of visual artefacts in multi-perspective technology management decision-making

- Review literature to understand theory and research to-date
- Interviews and observations to compare industry practice with theory

Map the affordances of digital technologies for overcoming challenges of integrating multiple perspectives

- Build on literature about the affordances of virtual and augmented reality
- Validate with experts from academia and industry

Design and test a digital tool to overcome an identified challenge of integrating multiple perspectives

- Systematically consider stakeholder representation in decision-making
- Test tool through quasi-experiments
- Apply tool with industry partner

References

[1] Environment, Food and Rural Affairs Committee (2022) Labour shortages in the food and farming sector, UK Parliament.
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[3] Klir, G.J. (2006) Uncertainty and Information: Foundations of Generalized Information Theory, Kybernetes. John Wiley & Sons
[4] Carlile, PR. (2002) A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development. Organization Science 13(4):442-455
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