A Multicriteria Decision Support Method for Distributed and Localised Food Manufacturing

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EPSRC CENTRE FOR INNOVATIVE MANUFACTURING IN Food

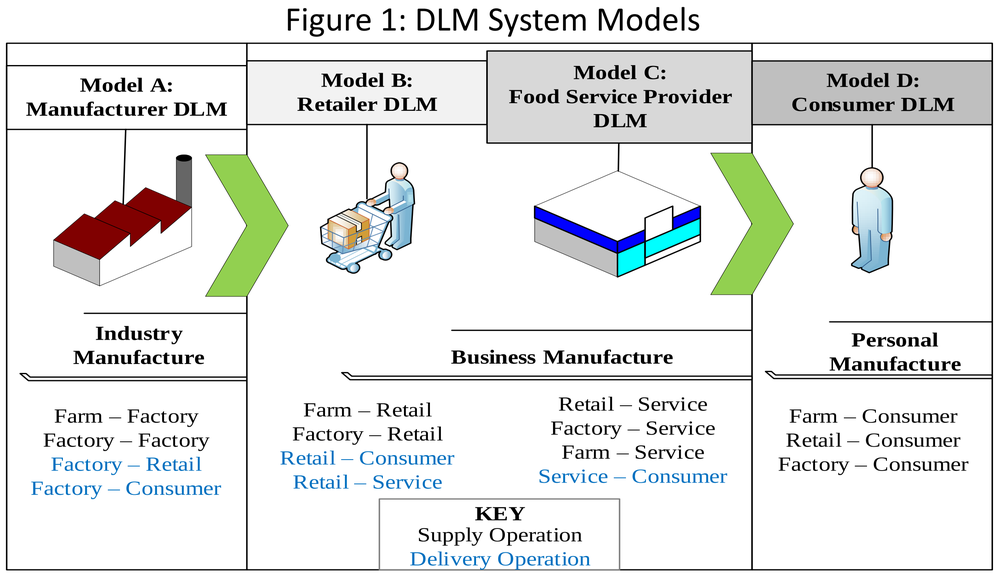
1. Project Aim

The long-term sustainability of food sector has become a major concern across the globe. Increasing transport costs, pressure from environmental legislations, changing diets and growing consumer demand for personalised food products necessitate more flexible production systems capable of reacting faster to customer needs. This research aims to investigate the development of alternative Distributed Localised Food Manufacturing models together with a methodology to assess their suitability in different scenarios.

2. Distributed Localised Food Manufacturing

- Distributed Localised Food Manufacturing (DLM) is an alternative system organisation strategy which aims to address current challenges and provide additional benefits to the food sector.
- DLM can minimise transportation needs, increase production facilities flexibility, create more resilient systems, and support future sustainable food provision through the implementation of innovative food manufacturing models (Fig. 1).
- This research includes a novel assessment methodology to help with the analysis of when, how and which products could gain substantial benefits from the implementation of the most suitable DLM model for their organisation.

Figure 1: DLM System Models



3. DLM Assessment Methodology

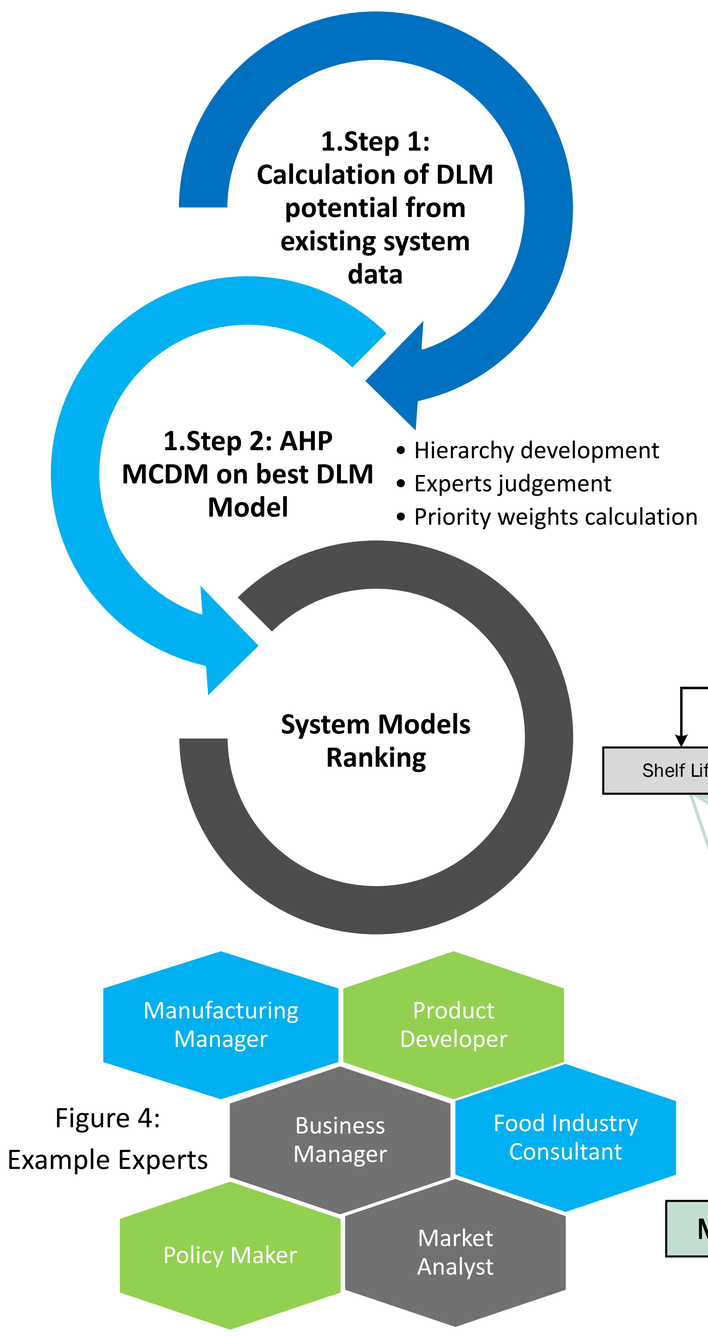
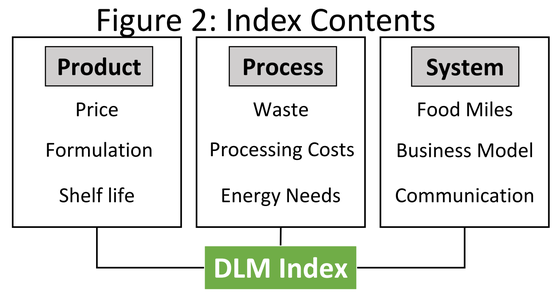


Figure 4: Example Experts

Step 1: Initial suitability assessment

The objective of the initial step is to identify the DLM potential based on current business data (Fig. 2). This approach provides a calculation on current practices and system performance with a perspective on its potential to shift towards a DLM structure.

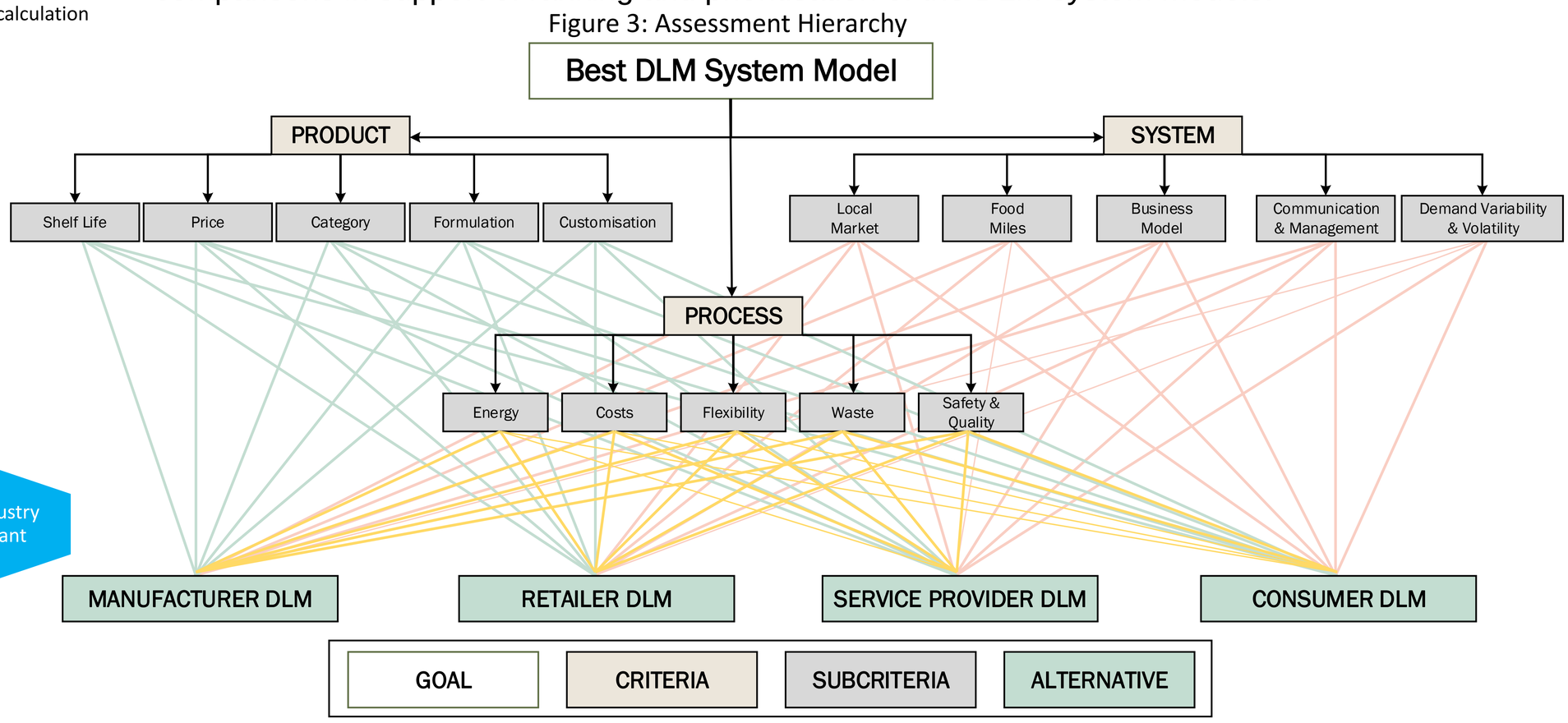
Figure 2: Index Contents



Step 2: AHP decision making support

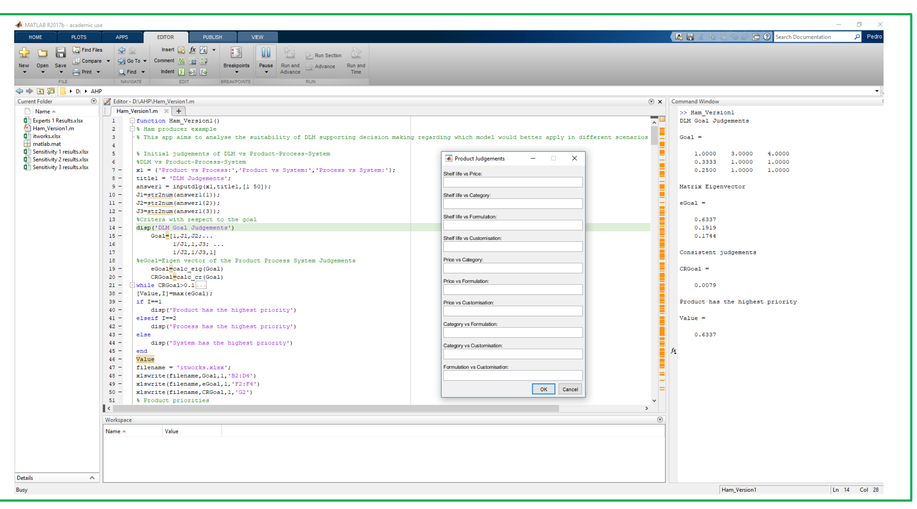
The second step develops an analytical hierarchy based on the selected DLM assessment criteria (Fig. 3). This hierarchy is then utilised by relevant experts (Fig. 4) to conduct the required pairwise comparisons in support of ranking and prioritisation of the DLM system models.

Figure 3: Assessment Hierarchy



4. Conclusions and Results Overview

- Food manufacturers need to be assured that DLM suits their strategic plans.
- The proposed multicriteria decision making methodology aims to increase the sustainability of future food production systems by supporting DLM analysis and implementation.
- The selection of best DLM models and identification of business potentials from DLM food production will aid the food sector to fulfil future consumer needs for customisation and personalisation.



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