

## **Co-designing knowledge flows for systemic innovation in textiles: bio-based, local, circular**

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Challenging as circularity is in any sector, textiles are particularly problematic: they have a distributed and complex value chain yet there is little residual value in post-use textiles, textile waste is heterogeneous and distributed. Textiles are produced within sectors (fashion/interiors) where there is constant change and high material throughput related to high consumption of garments and soft furnishings, with little consistency in waste materials (colours, composition and so on), and unpredictable use phases which results in unpredictable return of goods for further processing. Textiles are often combined with other materials, such as wood and foam in furniture, and metal and plastics in garments making disassembly and sorting economically challenging. While the packaging industry has been able to homogenise its materials through procurement agreements and coalitions (WRAP n.d.), the textile industry has struggled to settle on a unified strategy to ensure circularity. The fashion industries and academic communities also have often opposing views on the best course of action. Unlike the automotive and furniture industries, textiles remain light enough to transport at volume across large distances and so there are few negative feedback loops (aside from social and environmental factors) to leverage systemic change.

Policy reforms in the textiles and fashion industries are looming but progress is slow, and, without a clear pathway, the question remains: how can the socio-material textiles system transition? This paper presents initial findings from a Horizon 2020 research project – HEREWEAR – which attempts to create Systemic Material Innovation in the textiles ecosystem through local, biobased and circular strategies. This paper focusses on the role of co-design in enabling knowledge flow between project partners and stakeholders, to create a systemic view of the issues, concerns and illuminate opportunities for change. Key emergent themes from this approach are reported and discussed, as well as insights into the challenges and opportunities that have arisen from this research.

### **The Project Case**

HEREWEAR is a 4-year European H2020-funded research project<sup>1</sup> focussing on the use of chemical processes to transform agricultural by-products into high value bio-based fibres, yarns, textiles and garments. The consortia includes partners representing the textile value chain from raw material to market and importantly involves the stakeholder community. The project will have progressed through two-thirds of the funding period at the time of the symposium.

### **Methodology**

The specific study presented in this paper relates to a process of knowledge flow between project partners and external stakeholders, to help guide the development and translation of project knowledge into impactful guidelines and training materials at the project conclusion. The primary research involved conducting co-design workshops and interviews with project partners, and period of sense-making, translation and visualisation to develop co-design probes (Prendiville et al forthcoming) for a series of online stakeholder workshops. Next the outcomes of the workshops were thematically coded to reveal stakeholders' common questions and concerns relating to the project concept as a whole and to specific planned project outputs. These were then related back to partners and used iteratively as prompts to help guide and shape the contents of guidelines (being produced by each work package) and the strategy for training material development (being produced by the project as a whole) so that the project outputs address the key concerns and questions of the stakeholders. This process is ongoing and therefore represents early results.

### **Discussion and recommendations**

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By allowing consortium partners the space to explore and make explicit their assumptions about the value of their technologies and interventions, they were able to quickly understand the differences between their own conceptions, that of other partners and of the stakeholder community. For example, the notion and value of a ‘micro-factory’ was understood differently by several of the consortium partners, and the stakeholder engagement revealed questions and concerns that had not been prioritised by the lead partner, such as the link between digitisation and jobs, the social impact of producing garments at higher economic cost, and the expectation that waste materials could be reincorporated back into the micro-factory. The process also revealed many potentially positive social impacts of the micro-factory, especially in remote skills development. These findings echo across all project outputs discussed with stakeholders and will be elaborated in the paper.

The research reveals how an apparently complex value chain and a ‘difficult to imagine’ systemic innovation (bio-based/local/circular) can be unpacked and mobilised by facilitating knowledge flow between diverse partners and stakeholders (Hornbuckle 2022). Although the project has not reached its conclusion, the research has connected scientific research to the real world, and allowed scientists to begin to empathise with the perspectives of the people who are ultimately expected to adopt and adapt the technologies in order to realise the projects long-term ambitions.

It is recommended that all projects which seek real-world impact through scientific translation and technology ‘exploitation’ should prioritise the facilitation of knowledge flow between project partners (scientific knowledge producers) and stakeholders (lived experience knowers) to co-produce knowledge about how to achieve systemic innovation. Co-creating value (Vargo & Lusch 2004) in the project outputs is crucial to improving the likelihood of transition and transformation within society and industry.

## References

- Hornbuckle, R. (2022) Project Proximities: how design research addresses distance in complex collaborations. DRS 2022 Bilbao conference proceedings
- Prendiville, A., Hornbuckle, R., Fuller, S., Grimali, S., & Albuquerque, S. (forthcoming) Deep and meaningful: an iterative approach to developing an authentic narrative for public engagement. In XXXX (eds) Plant Molecular Farming [publisher]
- Vargo, S. L., & Lusch, R. F. (2004) Evolving to a new dominant logic for marketing. *Journal of Marketing* 68: 1–17.
- WRAP (n.d.) History of the Courtauld Commitment (online) <https://wrap.org.uk/taking-action/food-drink/initiatives/courtauld-commitment/history-courtauld-commitment> (accessed 31/03/23)