

## Building a Resilient and Sustainable Textile Supply Chain System

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### Project Description:

The global environment has become increasingly unstable, and this raises concerns on how organisations (and their supply chains) will deal with resource shortages and disruptions, and at the same time cope with environmental, societal, and economic impacts. From all the sectors that make part of our lives, textiles play a significant role. Nevertheless, there are a number of points through the textile supply chain that may be of concern, such as: the lack of sources of raw materials; the waste through many parts of the supply chain (including production process, high volumes of safety stocks); the customer's requirements for natural, synthetic as well as mixed fibres, leading to difficulties in recycling; the complexity of logistics (especially at the end of pipeline); the lack of actions on recovery, recycling and/or upcycling of textiles; the inadequate methods of textile disposals; and so forth. Regarding the latter, it is also recognised that a large volume of post-production and especially post-consumer textiles end up in landfills or incineration plants (Sinha et al., 2021). This issue therefore presents several short and long term concerns for the environment, as well as for health, wellbeing and the economy.

One of the ways to tackle this issue and help increase the level of sustainability is the development of a resilient and sustainable textile supply chain system. Although the concept of resilience may vary among scholars, it mainly focuses on the dynamic capability of an enterprise (which is highly dependent on its individuals, groups, and subsystems) to face immediate and unexpected changes in the environment with proactive attitude, and then adapt and respond to these changes by developing flexible and innovative solutions (Werner et al., 2020; Pereira et al., 2020). Thus, accepting that the above issues are difficult to fully control, and it may end up creating disruptions, organisations must learn how to prepare, learn and adapt their routines and operational procedures to become more resilient and at the same time promote a sustainable approach.

This project aims therefore to explore ways to build sustainable and resilient strategies on textile supply chains, which may focus not only on product design and recovery considerations, but also on data and technologies used to optimise the flow of products (forward and reverse) so as to reduce overall waste.

### **Proposed Methodology:**

The proposed methodology for this type of research allows the researcher to explore design management characteristics from a theoretical as well as a practical perspective by considering any aspect of textile supply chain. Proposals may focus on any angle of the textile industry, geographic region, and country. Data collection can follow a quantitative, qualitative and/or a mixed methods approach. This research also allows the application of simulation methodology (examples in Chilmon and Tipi, 2020; Gittins et al., 2020) with the use of big data capabilities that capture aspects of the supply chain and their complexities. This work also allows the development of data and use of big data analytics in the supply chain (Tipi, 2021) with specific application to the textile sector. Proposals should provide a justification regarding the selected methodological approach.

### **Research Impact:**

This work has the potential to generate significant impact to organisations aiming to adopt, for example, post-consumer textiles strategies, or are currently working with post-production textile, or a retail organisation aiming to optimise their returns or develop strategies for textiles extended producer responsibility compliance when it comes into force in the UK over the next few years. This work significantly contributes to the environment by designing a sustainable and resilient supply chain system and, at the same time responding to solutions on repurposing and reusing post-consumer or post-production textile after they have been discarded with the aim to eliminate waste.

Furthermore, by aiming to explore ways to incorporate the concepts of resilience and sustainability in designing the supply chain, it is envisaged that this work will influence theories in the area of operations management, such as reverse logistics, circular economy, supply chain management and design. At the same time, it will have the opportunity to make a contribution to the field of operational research with approaches that consider the use of simulation and big data analytics.

Proposals should provide a justification on how impact is to be achieved and what considerations give the researcher the confidence that there is potential to make a significant contribution to the body of knowledge in this area.

### **About the Supervisors:**

**Nicoleta Tipi** is an experienced supervisor having supervised to completion 18 PhD researchers studying full and part-time and has examined over 10 PhD theses. Her area of supervision includes topics in supply chain analytics, sustainability in product and process design, development of performance measurement systems, the use of simulation as a tool in modelling complex supply chain systems and others.

**Carla Pereira** is Lecturer in Operations & Supply Chain Management. She has a background in Industrial Engineering and has a long-standing interest in supply chain resilience and sustainability. Other areas of interest cover food waste, food recall, supply chain KPIs, purchasing and supply management, and humanitarian logistics. She has supervised undergraduate's scientific projects, master and PhD students in the above areas.

**Pammi Sinha**, Associate Professor of Fashion Management, has supervised 8 PhD's to completion and examined 18 doctoral theses (PhD and DBA) nationally and internationally. Her current PhD supervisions are: sustainable fashion, green advertising, design management for preserving heritage culture and fashion entrepreneurship. With a background in fashion design her research focus is circular economy approaches to design management in fashion and textiles (redesign, remanufacture, post-consumer textile waste management, ecosystems).

#### References:

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