UNIVERSITY OF MANNHEIM
Business School

CHAIR OF SERVICE
OPERATIONS MANAGEMENT
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Master Thesis Proposal

Sustainable Product Design Approaches for a Circular Economy – with Applications to the Case of Fairphone

Sustainable Product Design for a Circular Economy entails designing products with end-of-life considerations, ensuring that products and their components can be easily repaired, recovered, reused, or recycled. This concept is crucial in addressing pressing global challenges like climate change, resource depletion and increasing amounts of waste. By adopting circular design principles, businesses can drive innovation, cost savings, and competitive advantage. Consumers benefit from longer-lasting, more repairable products. Ultimately, Sustainable Product Design for a Circular Economy offers a pathway to a more sustainable future, promoting economic growth, social equity, and environmental stewardship.

At Fairphone, circularity is core to their mission of creating a fairer, more sustainable electronics industry. Their modular design philosophy ("design for R") ensures easy repair and upgradeability, extending product lifespan and facilitating reuse, repair, refurbishment, and recycling. Fairphone also prioritizes responsible material sourcing and operates a Buyback program to encourage refurbishment of old devices. By advocating for systemic change, Fairphone leads the charge towards a more circular and sustainable electronics sector.

The tasks and objectives of the master thesis are to

- Motivate why we need to rethink the current approach how to design our products and the underlying supply chain from a linear to a circular system.
- Define the term "sustainable product" and discuss the common design strategies to make our products more sustainable.
- Review Fairphone's business model, including its product and supply chain design, customer value proposition, economic viability and environmental performance.
- Introduce conjoint analysis and conjoint-based product design models. Perform a conjoint analysis and a market simulation to assess Fairphone's product design and value proposition in depth. What features do potential customers value most? Would you recommend any changes to the current product design and its pricing? How do you make trade-offs between economic and environmental goals (maximizing profitability versus minimizing environmental harm)? How to trade off complex strategic and operational decisions that simultaneously tackle supply and demand challenges in a circular supply chain?
- Discuss how sustainable business models in the electronics industry in general and Fairphones business model in particular might look like in the future, and what research can contribute.

Requirements

- OPM 7xx

- Good knowledge in Operations Management
- Analytical skills

Administrative information for writing a master thesis at the Chair of Service Operations Management can be found here.

Selected Literature Recommendations

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Suzanne, E., Absi, N., & Borodin, V. (2020). Towards circular economy in production planning: Challenges and opportunities. European Journal of Operational Research, 287(1), 168-190