

**UPLIFT CIRCULAR FASHION BUSINESS THROUGH
APPLICATION OF VIRTUAL PROTOTYPING FOR
REFASHIONING**

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Degree of Master of Science

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Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements for the degree
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DECLARATION

“I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

As a dynamic industry in the globe, the fashion industry is still growing with constantly changing trends. Even though the apparel industry is transforming with new technology and innovation, the limitations in waste management systems and traditional take – make – waste linear business models accumulate higher level of waste every day. Therefore, the industry demands more circular initiatives such as upcycling (redesign and refashioning); green and clean lifecycles of products; timeless designs; Product Service Systems (PSS) such as rent lease, swap, secondhand/ vintage clothing; on demand production under circular fashion business models. Circular fashion concept is one of the key aspects in the circular economy, which aims to minimize the waste and optimize the resources. Though the published literature profusely discussed the sustainable fashion, there is still a gap between how theory applies into practice. On the other hand, digital technologies (mostly CAD technologies) are emerging to enable strategic adoptions into the apparel industry such as on demand manufacturing, mass customization and virtualization; which controls unnecessary productions, thus waste. Therefore, the aim of this research was to explore digital technology applications (CAD and Blockchain technology) to establish a new venture in circular fashion business. Accordingly, the study tested the viability of utilizing 2D/3D CAD technologies in proposed circular fashion business approach. In particular, it focused on the capabilities of aforementioned digital technologies for a novel business model for circular fashion, focusing refashioning second-hand clothing. Importantly, 2D/3D CAD technologies were utilized in re-fashioning the second-hand clothes while the Blockchain technology was suggested to establish the traceability and as a networking tool for the supply chain in proposed circular fashion business. Subsequently, this business model was developed with the contribution of industry (CAD and fashion design) experts. As a result, this study extends the existing circular fashion business model with a novel approach of digital technologies and tested CAD applications. This proposed model suggests longevity of product lifespan by encouraging the refashioning second-hand clothing as an upcycling option through CAD and relevant digital technology.

Key words: CAD, Circular Business Models, Circular Fashion, Refashioning, SHC, Virtualization.

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LIST OF ABBREVIATIONS

- AR – Augmented Reality
- BMG – Business Model Generation
- BMI – Business Model Innovation
- CAD – Computer Aided Design
- CAM – Computer Aided Manufacturing
- CE – Circular Economy
- CF – Circular Fashion
- DIY – Do It Yourself
- DLT – Distributed Ledger Technology
- DOI – Digital Object Identifier
- EF Renew – Eileen Fisher Renew Programme
- IOT – Internet Of Things
- PAAS – Product-As-A-Service
- PDS – Pattern Design Systems
- PSS – Product Service Systems
- RAAS – Retail-As-A-Service
- SHC – Second Handed Clothing
- VR – Virtual Reality
- WRAP - Waste & Resources Action Program