

Environmental Impact Assessment of Augmented Reality Technology Implementation: A Case Study in Remanufacturing

Background

As a promising Industry 4.0 technology, Augmented Reality (AR) technology has been increasingly implemented in manufacturing processes, especially in the assembly and disassembly of the product. Furthermore, AR could play an important role in evolving manufacturing towards environmental sustainability that manufacturers are also increasingly prioritizing. However, very few studies have been carried out to evaluate the environmental impact of AR technology implementation. Meanwhile, the engine remanufacturing process in Volvo Group Trucks Operations (GTO) plant is adopting AR technology for design and preparation before launching into practice. It is of both scientific and business interest to assess the environmental sustainability implication of technology implementation, including the technology lifecycle.

Aim

Quantify the environmental impact of AR implementation in engine remanufacturing process, including the AR technology lifecycle.

Tasks and methods

- 1) **Data collection.** Data on the implementation stages of AR will be sourced directly from Volvo through company contact. Data of the other stages of the lifecycle will be sourced from either suppliers or literature.
- 2) **Material and energy flow mapping.** Create an inventory of relevant inputs and outputs, define scope of analysis based on data availability (carefully considering results validity).
- 3) **Environmental impact analysis.** Recommended methods using simplified Life Cycle Assessment (LCA) or Material Flow Analysis (MFA), including sensitivity analysis;
- 4) **Lesson learnt:** Compare materials and manufacturing solutions, suggest improvements and potentials for adopting AR in an environmentally friendly manner.

Requirements and timing

Two master students. Preferable with engineering background. Experience or knowledge of LCA is strongly recommended.

Duration: 2021.01 – 2021.06

Academic contacts

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Industry contacts

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