HSLU Hochschule Luzern

Technik & Architektur

Master Thesis MSE Business Engineering

Digitally-enabled PSSs in a start-up environment

Problem

This thesis examines the potential for service business development and new service opportunities in the field of horticulture enabled by digital technologies such as remote monitoring, artificial intelligence, and the internet of things. The study is based on a single case study of a start-up that provides intelligent solutions for plant lighting.

The case study company is developing an intelligent lighting system for the horticultural and vertical farming industry, which can adapt characteristics such as its light spectrum to enhance the plants' growth and various traits such as secondary components. Therefore, new possibilities arise for creating a product-service system (PSS) covering the changing needs of the horticulture industry by using the opportunities offered by advancing technological developments. Furthermore, those technical developments offer new service possibilities based on data-driven value propositions.

Solution

The process of implementing a digitally-enabled PSS can be complex and requires flexible planning and execution. Therefore, an action research approach to gather data for an internal analysis of the start-up and an external analysis of the ecosystem. It was used for ideation and service design to propose new value propositions to develop the business model and an implementation roadmap.

Results

By analyzing the different value propositions, process outcomes, and the ecosystem in which the product-service system is offered, the study found that an in-depth understanding of the ecosystem is necessary, and an iterative approach is needed for the implementation of a digitally-enabled PSS. Various tools, such as ecosystem mapping, avatar journey mapping, value proposition canvas and business model navigator, were applied to derive clear and actionable value propositions for the digitally-enabled PSS. Based on the findings, the study proposed a process map that companies can use to effectively plan and execute the implementation of a PSS in a start-up environment. The process includes an internal analysis of the start-up, an external analysis of the ecosystem, ideation and service design an implementation roadmap.

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