

Strategic Technology and Innovation Management Programme 2016

System Design Characterisation

Dr Imoh Ilevbare
imi22@cam.ac.uk

&

Dr Man Hang Yip
mhy29@cam.ac.uk

System Design Characterisation is a workshop process that clarifies design task of a new product or service offering (or product-service system) at early stages of development.

It does this through a systematic breakdown of the new design into its components, showing interactions between the various design elements and providing an indication of design complexity.

SDC is carried out in 4 steps:

1. Stakeholder identification
2. Decomposition of the offering to its various elements and identifying the relationships between those elements
3. Representation, to examine the offering characteristics, and design complexity
4. Abstraction, to understand the implications of offering characteristics for the business.

Aims

This project aimed to:

- Actively and practically assist product development teams of STIM member companies to clarify designs of their new product, services or product-service systems
- Apply the System Design Characterisation process to a variety of NPD and design problems to improve it.

Deliverables

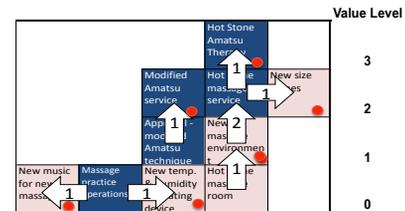
- Delivery of SDC workshops at collaborating STIM companies, who would own the outputs and also have understanding of how they may carry out the process by themselves, and
- Identification of benefits derived from the process and provision of an understanding of product-service system configuration types.

Progress made

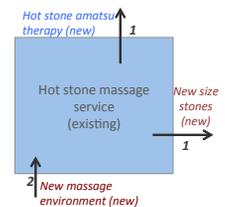
In-company pilots were carried out resulting in useful modifications to the process. These modifications were made to facilitate better decision-making, and they include:

- Changing from a 1-day workshop to a 2 half-day workshop format, to allow for analysis of, and reflection on, decomposition outputs, and
- Simplifying the visual format of the representation diagrams. We now focus only on the dependencies and influences of the most critical elements.

Previous representation diagram format



An example of the new 'mini-representation' diagram for a critical element and its influences/relationships



Furthermore, the pilots have shown the importance of differentiating between task complexity (associated with developing each individual design element) and relational complexity (associated with the impact of cross-dependencies across design elements).

Future research & engagement

There is scope to improve the process through further pilots. Issues to address include:

- Deriving a better understanding of the difference, as well as any dependencies, between task complexity and design complexity.

Company interest to apply the process is welcome.