

Sustainable product-service systems for an office furniture manufacturer

By

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Context

Project aim:

- New office chair designed for longevity
- Integrated Product-Service System

Ecodesign Centre role: support company on designing sustainable PSS and product environmental impact



By achieving a four-fold reduction (4x) in resource intensity in comparison to their next best performing

ACTION: Life Cycle Assessment



By potentially integrating a ECO-WISE responsible for remanufacturing of the new office chair

ACTION: pilot-case study



By being financially viable

Orangebox

orangebox



UK –based **large furniture** company with **in-house design** and **manufacturing**

B2B markets: corporates, education, hospitality and public sector

Good practice in **sustainable design, closed loop systems**

Take-back system in place

Uptake of take-back scheme: **low**



Life Cycle Assessment

Objective: sustainable PSS by achieving a four-fold reduction (4x) in resource intensity in comparison to their next best performing product

Functional unit: 1 hour of use of the chair

Scenarios:

- 5 years of single use
- 10 years of use
- + remanufacturing
(seats fabric, seat foam and mesh)
- 15 years of use
- + remanufacturing

Scenario	Impacts (mPts per functio. unit)	CO2 eq. kg/ funct. unit	Performance improvement from reference (mPts)	Performance improvement from reference (%)	Service units
Ref.	0.0015	0.0096			8695
5 yrs	7×10^{-4}	0.0085	7.9×10^{-4}	53	8695
10 yrs	3.7×10^{-4}	0.0046	0.0011	75	17390
15 yrs	2.4×10^{-4}	0.0030	0.0012	84	26085

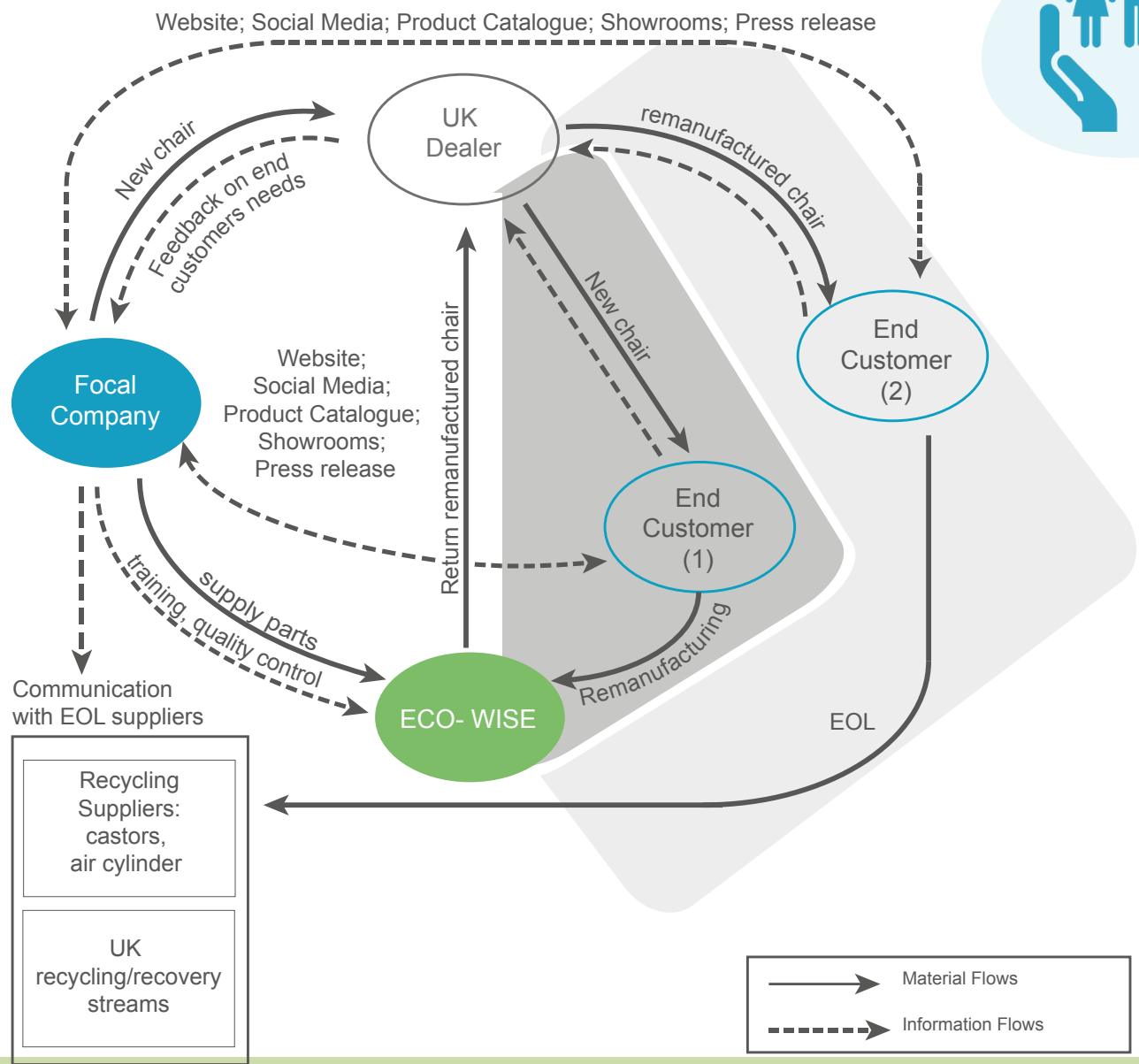
Pilot case study



- We designed a **pilot take-back scheme** using a local **ECO-WISE** responsible for the **remanufacturing of a popular office chair**
 - This chair was not designed specifically for disassembly and recycling but **98% of the chair is recyclable**
- Working with ECO-WISE would also **strengthen** the company's **commitment to the triple bottom line approach**
- Would **remove** the focal company responsibility for **storage** and **refurbishment or remanufacturing**, allowing them to remain focused on its core business activities
- ECO-WISE employees have **background experience in the furniture sector**

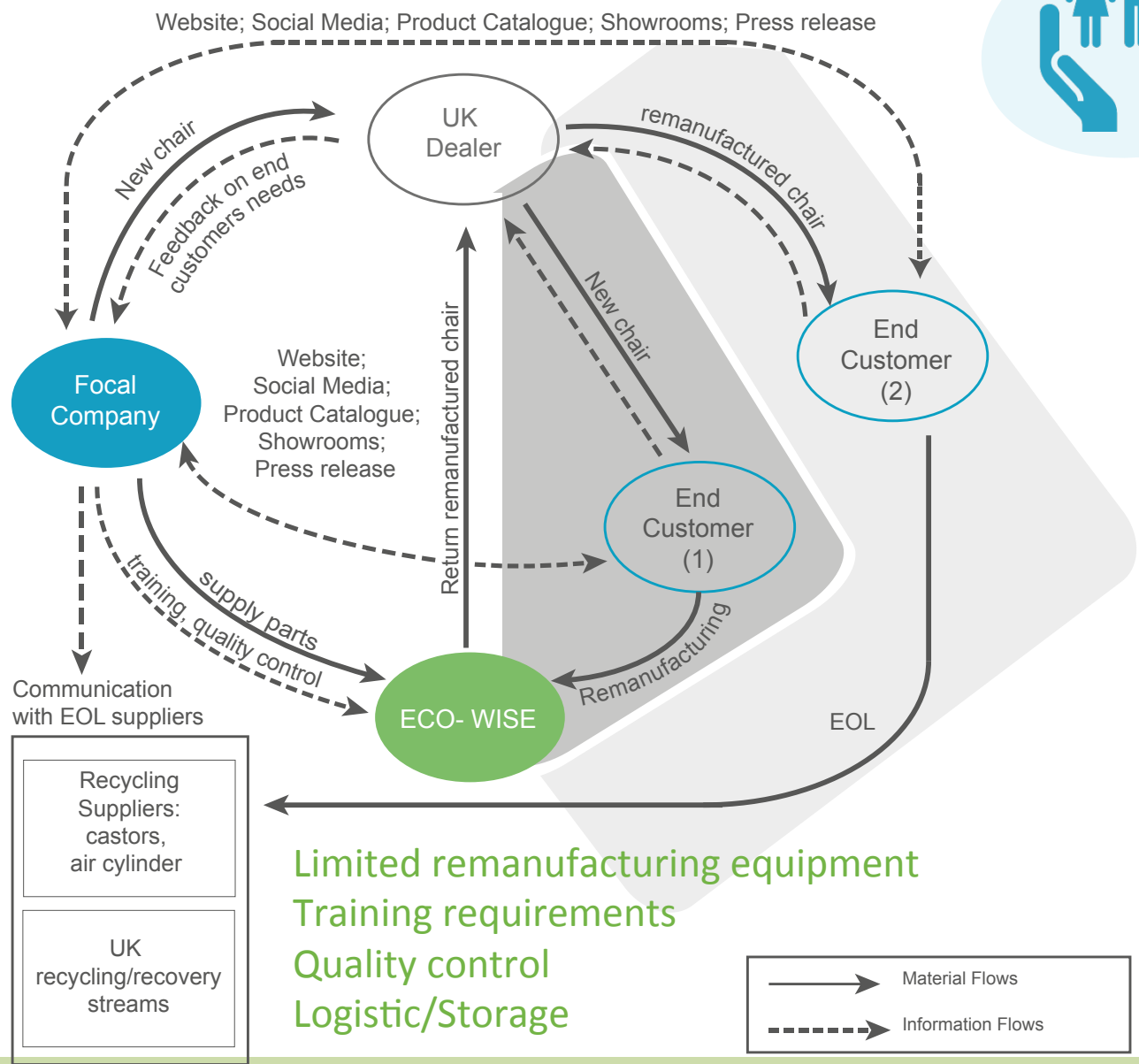


Pilot case study





Brand reputation
 Investment in remanufacturing equipment
 Or
 Carry out some of the remanufacturing
 Limited storage capacity



Pilot case study

Limited remanufacturing equipment
 Training requirements
 Quality control
 Logistic/Storage

Lessons from pilot case

- Potential for the ECO-WISE **work-flow to be sporadic**
- A need for **careful management** of the **take-back scheme**
- **Market research** of both corporate partners and second market
- **New cross-functional service team**

Use-oriented PSS scenario

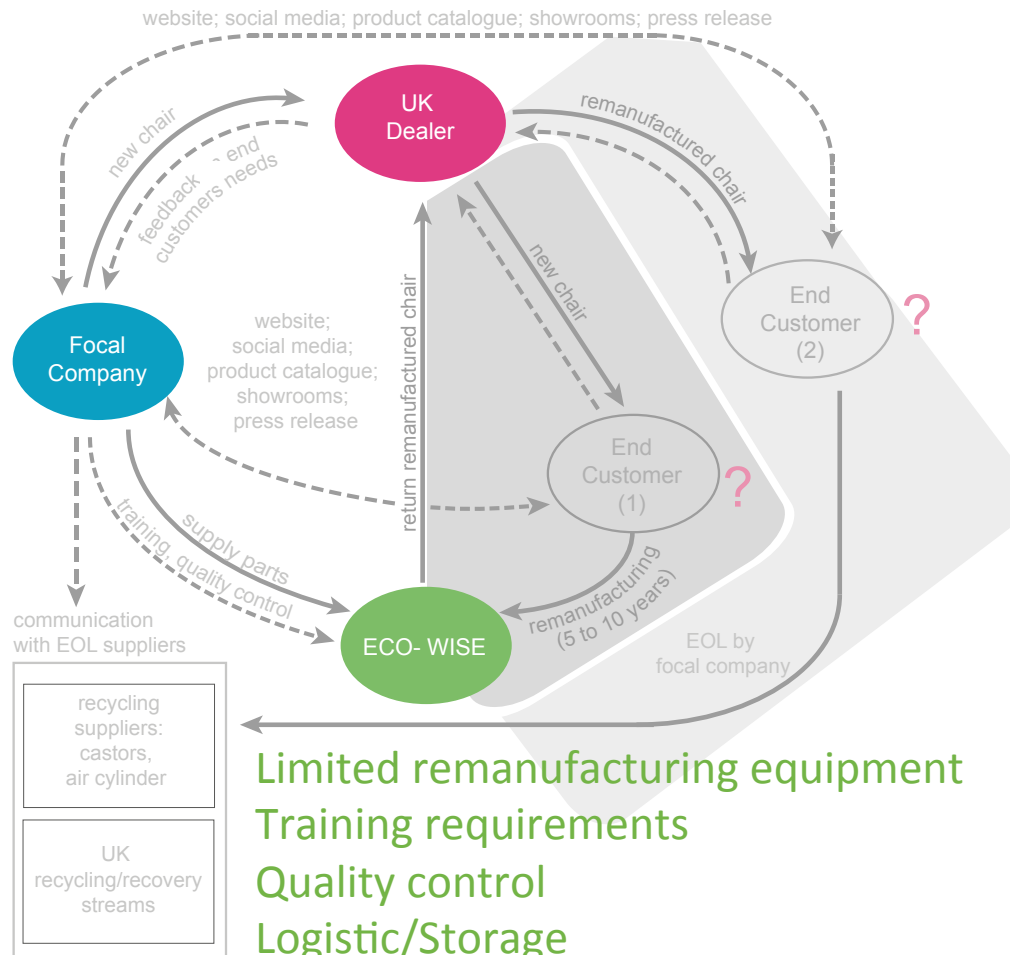
Dealers culture:
 Lack of experience in selling a service
 Risk of selling other competitors products instead

Lack of evidence to convince top management of use-oriented PSS

Sales Team culture: no experience in selling a service

Brand reputation

Financial viability



Limited remanufacturing equipment
 Training requirements
 Quality control
 Logistic/Storage

LCA



Service design methods



Sustainable PSS indicators

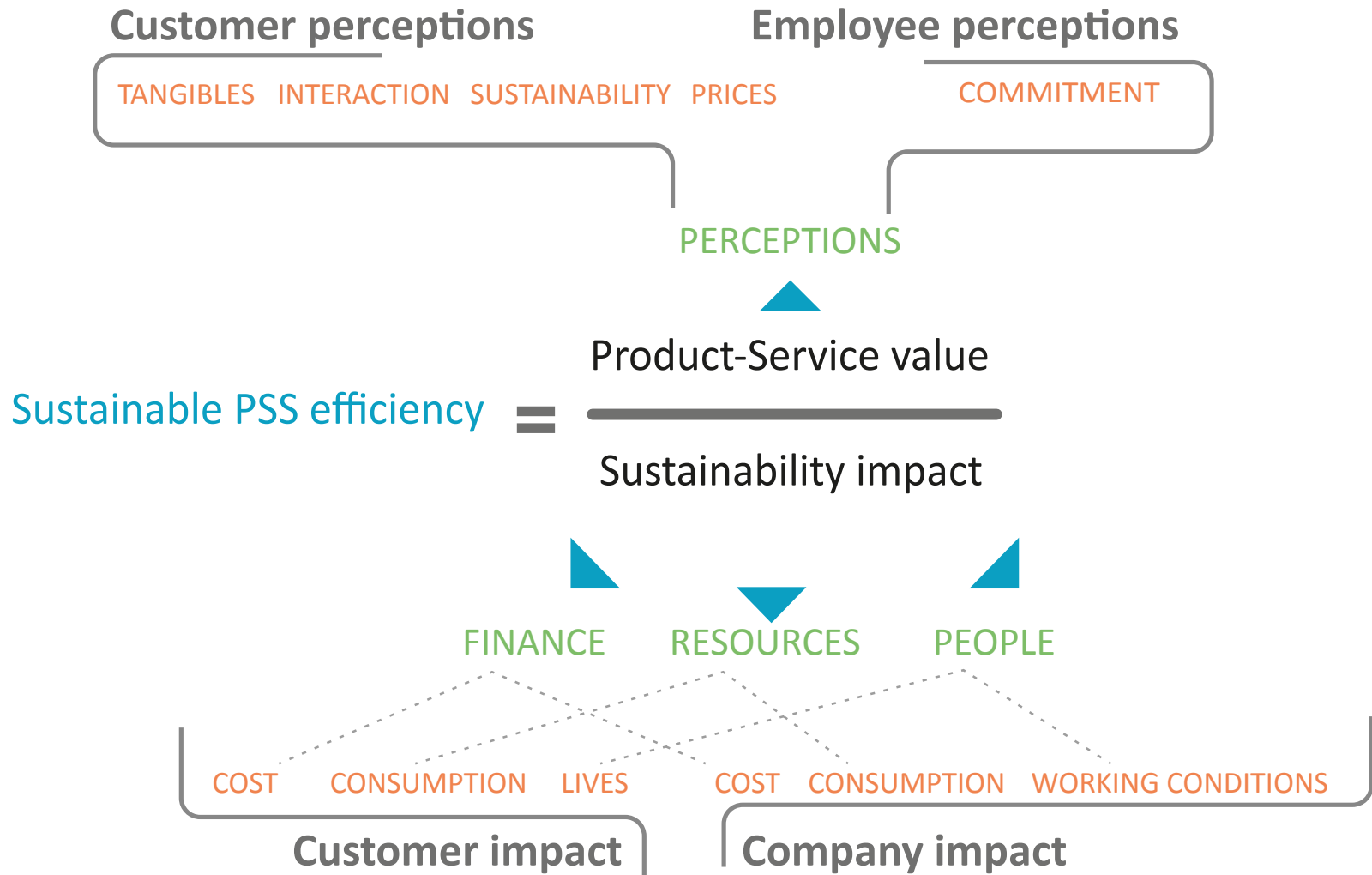


(Prendeville, 2015)

Pictures from  and thisisservice.designthinking.com

(Chou et al, 2015)

Sustainable PSS indicators



Service Design Process



Service designer experts

Identify key stakeholders

Understand stakeholders perception of: tangibles, interaction with service offer, sustainability and price by conducting:

- interviews
- observation

Build personas for each stakeholder

Create 'journeys' for PSS showing the touchpoints

Review of similar and competitor services

Prepare workshop activity with company on:

- presenting insights, opportunities; feasibility and ideas from the study
- additional technical information

Prepare ideation workshop materials

Attend workshop

Write PSS model aims and design brief

Create draft service blueprints for new PSS

Present to focal company:

- service blueprints
- PSS aim and design

Design service prototype and set up user-testing

Invite focal company to user testing

Create final service blueprint and user journey

Create final service touchpoint visuals

Write new roles and responsibilities for focal company employees involved in PSS

Write PSS feasibility and viability report

Design brief and service specification document

Company

Meet with external service design team and identify the key stakeholders for PSS

Support stakeholders contact

Attend meeting

Select the final PSS model

Attend user-testing sessions and final service prototyping

Produce economic, social and environmental projections for final PSS

Pitch final PSS to senior management with external service designer experts

Outputs

Key stakeholders identified

Understand stakeholders perceptions

Personas developed for each stakeholder

Stakeholder 'journeys'

Insights & opportunities report

Workshop materials

New PSS models

Design brief document

New service blueprints

Final PSS model

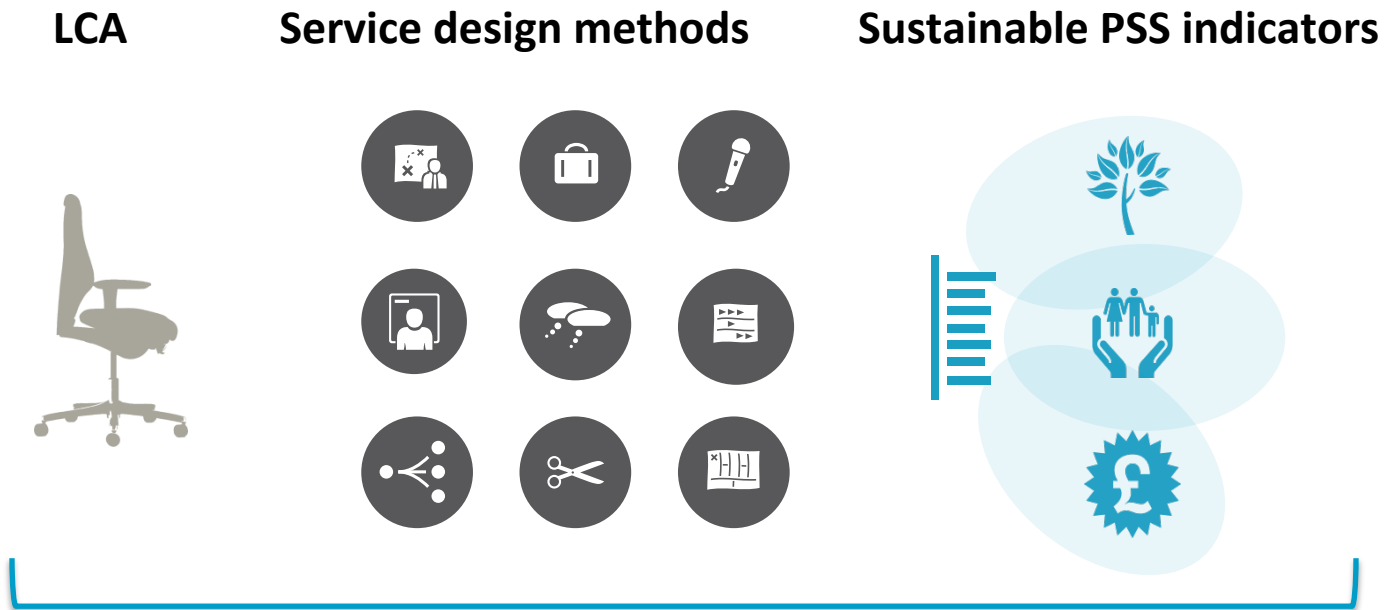
Service prototype

Final service blueprint

Product-service system feasibility and viability report

Design brief and service specification document

Sustainable PSS design process



(Prendeville, 2015)

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(Chou et al, 2015)