Circular Economy and Product/Service-Systems
best practices for sustainability-driven business transformation

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Lifting business competencies

Lifting business competencies

Resource-Efficient Business

- 1,660,000 washing machines in DK
- ~8% of electrical energy consumption for appliances in DK
- ~25% of water consumption for households in DK
Resource Efficient Business

- Focus on material and energy efficiency
- LCA expertise
- Product efficiency as innovation driver
- Resource-efficient mindset = resilience for the company

Electrolux, 2015
Resource Efficient Business

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- How to systematise?
- How to keep abreast of new knowledge?
- How to move beyond the product to the system?
- How to make good practice less person-dependent?
Lifting business competencies

RE → PSS --> CE
Product/Service-Systems

• Philosophy: Discretely alter the consumer’s relationship to the product towards service

• Approach: Pay-per-use system + replacement programme + central data logging

• Result:
  • Pay-per-use system implemented in 50 households
  • Energy efficient digital washer
  • Central database + ‘Smart energy meters’
  • Replacement: 1000 washes (4-5 years)
  • Established in 1999 in Gotland, Sweden

• How to maximize value?
• How to close the loops of materials?
Motivation to servitise
Why be concerned about product and service?

Most products are not traditionally designed for service:

- Design for Maintenance
- Design for Upgrade
- Design for (Remote) Monitoring
- Design for Reuse
- Design for Replacement
- Design for Longevity

[after Wise & Baumgartner, HBR, 1999]
Motivation to servitise
Business motivation for Product/Service-Systems

Is PSS actually anything new..?

- Aeroplanes, shipbuilding, medical equipment, the local laundrette...

- PSS focuses on providing what customers actually want to pay for

- Creates ongoing relationships between company and customer

- Allows companies to enhance their competitiveness

- Customer outsourcing, reducing costs, making new resources available

- Knowledge-adding may raise the product’s value and utility for the customers

- PSS is designed into the value proposition from the very start
Product/Service-Systems in the maritime industry?
The PROTEUS project
Product as a service in the maritime industry

PROduct/service-system Tools for Ensuring User-oriented Service
Methods and implementation in the maritime branch

Innovation Consortium
Feb 2010 – December 2013
The PROTEUS project
Recognising the need to servitise
The PROTEUS project

1. Maritime branch analysis
   DK has a leading branch, with respect to quality and efficiency.

2. What do other industries do?
   It's difficult to servitise, but the benefits are considerable.

3. If/when to servitise?
   Each company we studied is different and therefore needs careful guidance.

4. How to design a PSS?
   Comprehensive development of own tools, plus design methodology.

5. How to organise company for PSS?
   Understanding of the change situation of the company, for the adoption of PSS.

6. What can PSS partnerships give?
   Many cost and energy savings, new business, greater global presence.

7. How to make business out of this?
   Creation of business model concepts and trialling of these in the branch.
   Plus:
   - 25 academic publications
   - and more in pipeline
   - 3 PhD projects underway
   - 6 bachelor projects
   - 10 master projects
   - 2 open industry conferences
   - PSS Configurator...

www.proteus.dtu.dk
The PROTEUS project

A whole palette of PSS offerings

[www.proteus.dtu.dk]
The PROTEUS project
PSS business models
Lifting business competencies

RE → PSS --> CE
Circular Economy

First of all, what is Circular Economy?

Linear economy

• Take-make-consume-dispose
• High material use intensity
• Significant business risks

[Ellen MacArthur Foundation, based on EU Commission]
Circular Economy

First of all, what *is* Circular Economy?

**Circular Economy (CE)**
- Closed-loop systems
- Value creation decoupled from resource consumption
- New business opportunities estimated at €1.8 trillion/year

**Linear economy**
- Take-make-consume-dispose
- High material use intensity
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Circular Economy

First of all, what is Circular Economy?

“A Circular Economy is restorative and regenerative by design, and aims to keep products, components and materials at their highest utility and value at all times.”

[Ellen MacArthur Foundation]
Creating a CE requires fundamental changes throughout the entire value chain!

Circular Economy (CE)
- Closed-loop systems
- Value creation decoupled from resource consumption
- New business opportunities estimated at €1.8 trillion/year
Circular Economy

- Only up to 10% of collected machines currently get refurbished
- Material costs in the refurbishment process could be reduced by up to 40%
- Material input costs per product could be reduced by up to 60%

EMF, 2015

- How to capture value?
- How to engage key stakeholders?
- How to develop infra-structure?
- How to track and trace the product health?
Circular Economy

- Circular Economy activity has an estimated potential to double the size of Steelcase’s business
- Circular Economy is a manifestation of our purpose
- Steelcase is systematizing its business foundation, -excellence and -innovation activities for Circular Economy

[Steelcase, 2017]
Circular Economy

Steelcase’s path towards Circular Economy inspired business
Circular Economy
Steelcase’s path towards Circular Economy inspired business

For more than two decades, Steelcase has been developing excellence in Product Design & Performance.

As the global leader in the furniture industry, Steelcase has led the way in closed-loop product design thinking.

(Resource Efficiency)

[Steelcase, 2016]
Circular Economy
Steelcase’s path towards Circular Economy inspired business

Three pillars guide Steelcase’s efforts to innovate, improve, and deliver on their product promises

- Material chemistry
- Life cycle thinking & LCA
- Reuse and Recycle

[Steelcase, 2016]
Circular Economy

Steelcase’s path towards Circular Economy inspired business

Steelcase created services inspired by the Circular Economy

[Steelcase, 2016]
Circular Economy
Steelcase’s path towards Circular Economy inspired business

The promise of New Business Innovation:

We need to embrace real change and innovation in our business models.

At Steelcase, we continue exploring and experimenting with new business models inspired by the Circular Economy.

This also requires a shift in our approach to evaluating risks and profits!

[Steelcase, 2016]
Circular Economy

Steelcase’s path towards Circular Economy inspired business

The promise of Designing for Circularity:

We need to embrace new design sensibilities.

- Long life
- Sharing
- Modularity
- Re-pair
- Re-furbishing
- Re-assembly
- Re-manufacturing
- Re-valorisation

[Steelcase, 2016]
Circular Economy

Steelcase’s path towards Circular Economy inspired business

But how to actually get there? – Moving from one-off to serial business success?

Our ability to accelerate the transition to a Circular Economy will require:

- To continue leveraging CE as a guiding framework for innovation, in particular for business innovation
- To continue building and enhancing a supportive organizational & innovation culture
- To develop the adequate business foundation across the company
- To empower the key stakeholders within the company
- To demystify and change our approach to risk & ROI
- To continue engaging in strategic partnerships
- To leverage the promise of IoT
- To continue living our design thinking approach
- To co-create with customers

[Steelcase, 2016]
Lifting business competencies

RE → PSS --> CE

Resource-Efficient Business

Product/Service-Systems

Circular Economy

RE → PSS → CE

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3

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To summarise

- **Product/Service-Systems** can certainly contribute to the creation of new business opportunities ... but it is not a given

- **Product/Service-Systems** can certainly contribute to increase sustainability performance ... but it is not a given

- We see **Resource Efficiency, Product/Service-Systems** and **Circular Economy** as a continuum for businesses to work through, whilst increasingly refining innovation and sustainability performance, simultaneously

- There are many good cases, but few methodologies – we will show more later today, about our approach to solving this.
Thank you for listening!