

A?

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Disruptive innovation: From products to systems and services

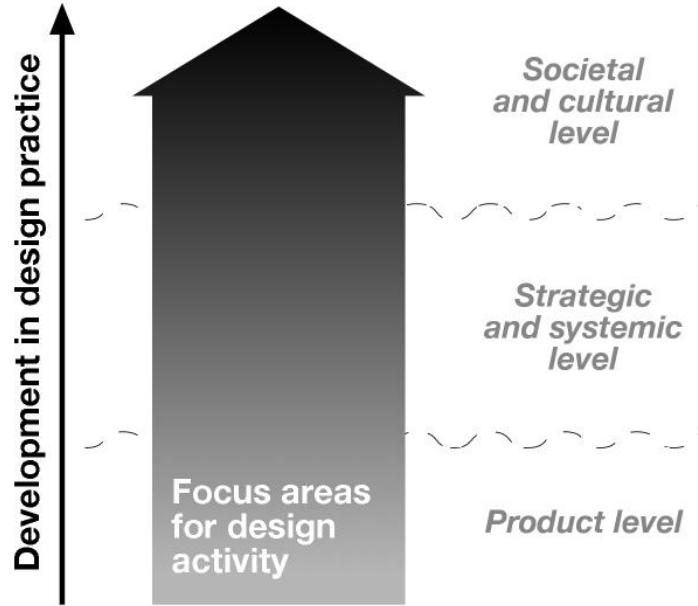
Aaltonaut BA / Product Sustainability
Tatu Marttila
10.11.2020

From incremental to disruptive development

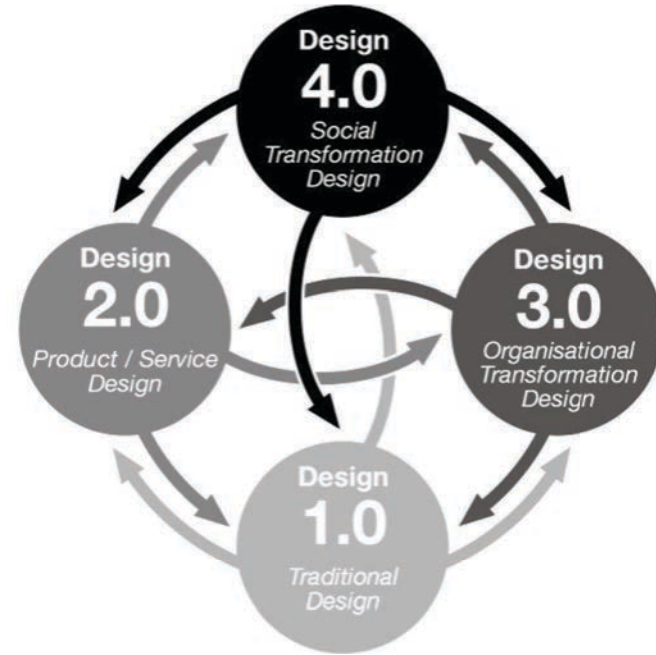


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Emerging areas for sustainable design action

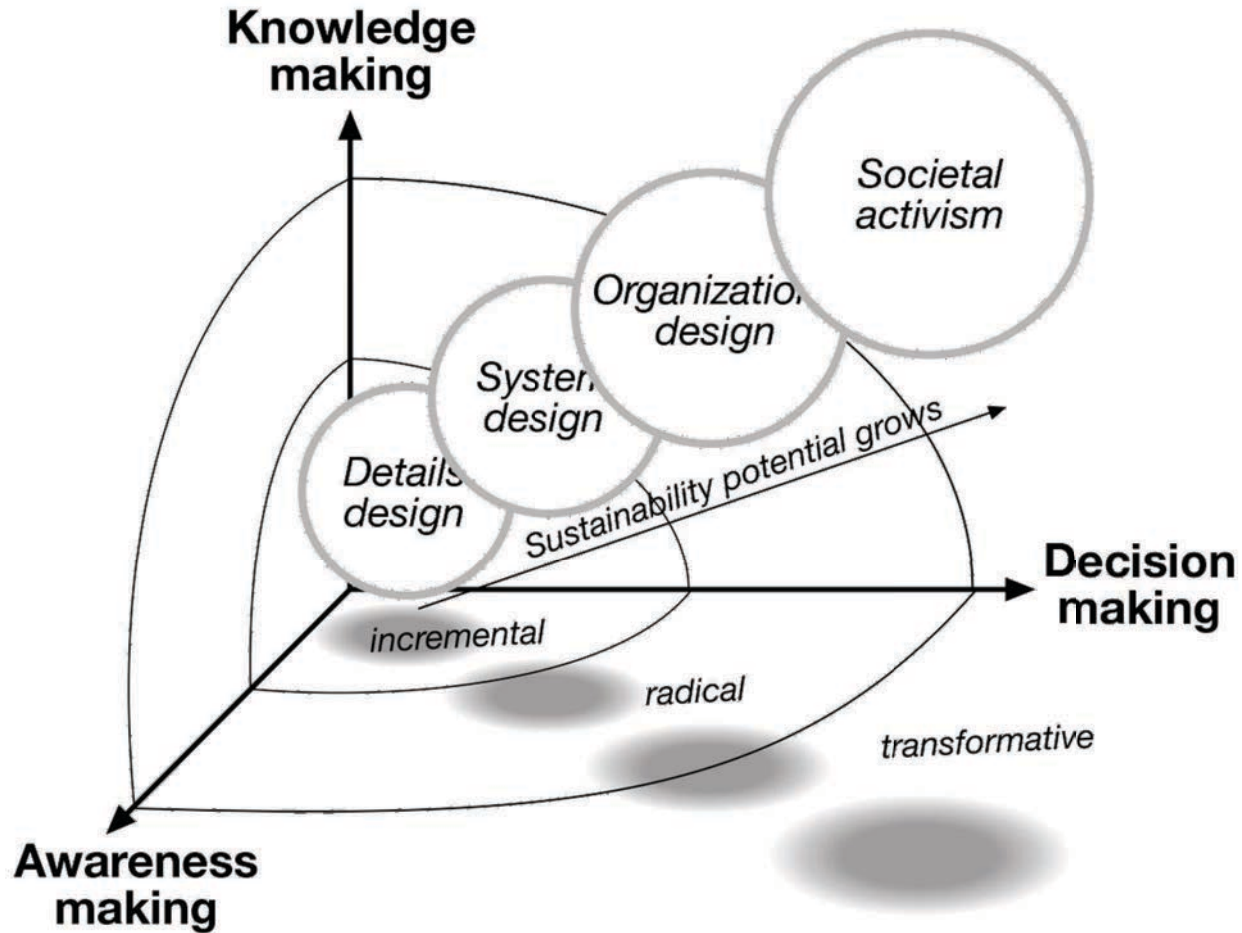


Source: Author



Source: Aminoff, et al. 2011;
GK VanPatter and Elizabeth Pastor, 2005

Comparing and linking approaches for sustainable design:



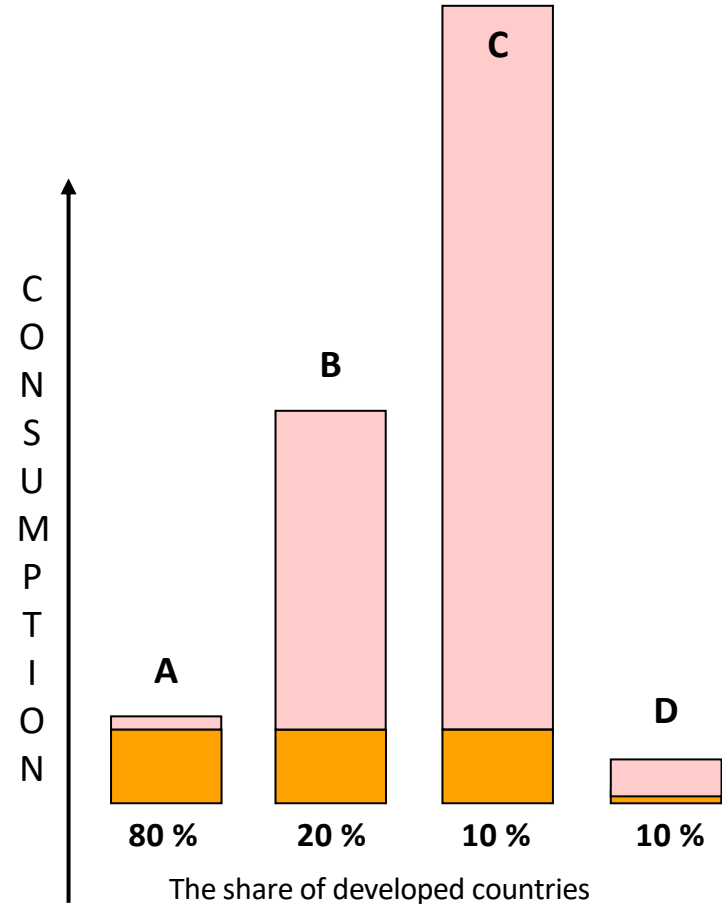
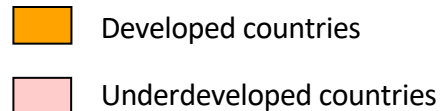
Factor thinking: Increasing efficiency by 'factor 10'

A = current level of consumption

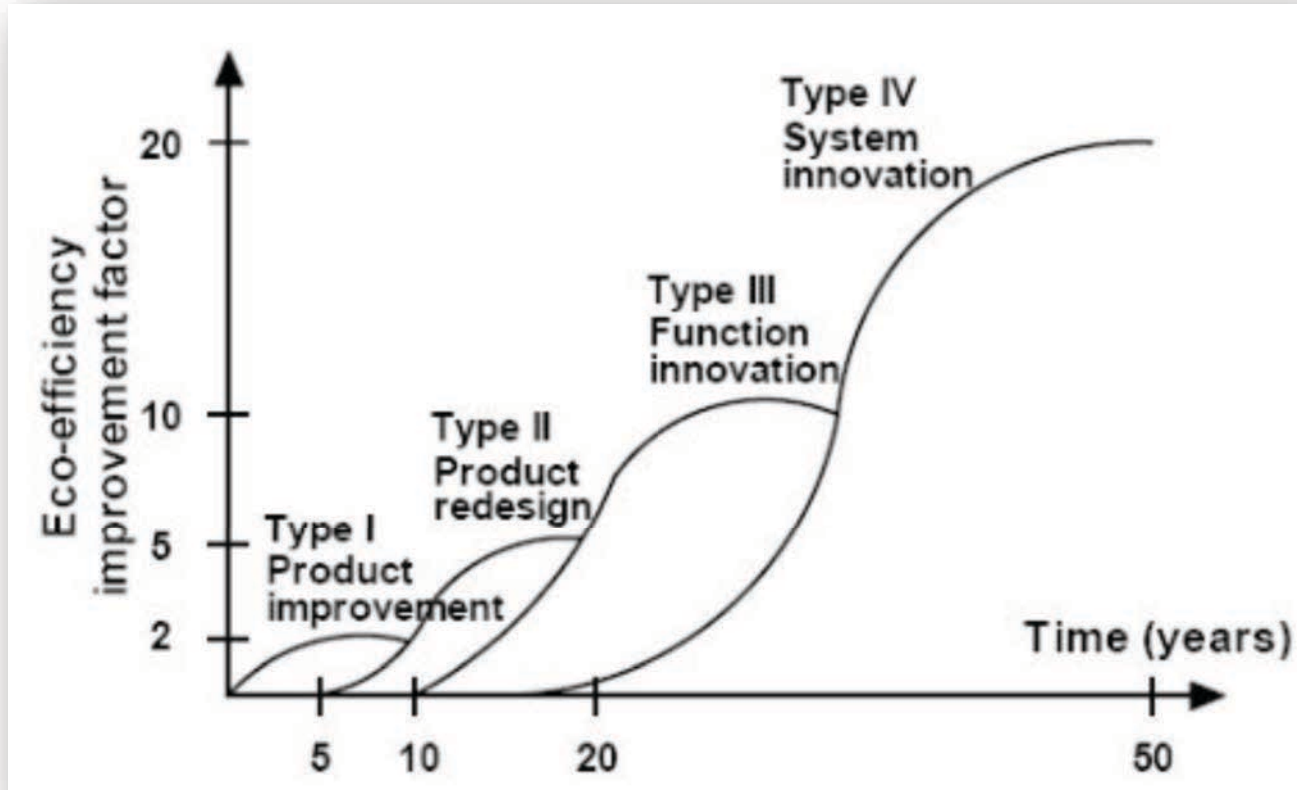
B = raising undeveloped countries to the level of developed countries -> 4 x present

C = in addition to B population will grow to 10 billion -> 8 x present

D = sustainable consumption ~half of the present -> consumption in developed countries must be cut into 1/10 (**factor 10**), if targeting to globally equal setting



From improvement to redesign, and to functional and system innovation:

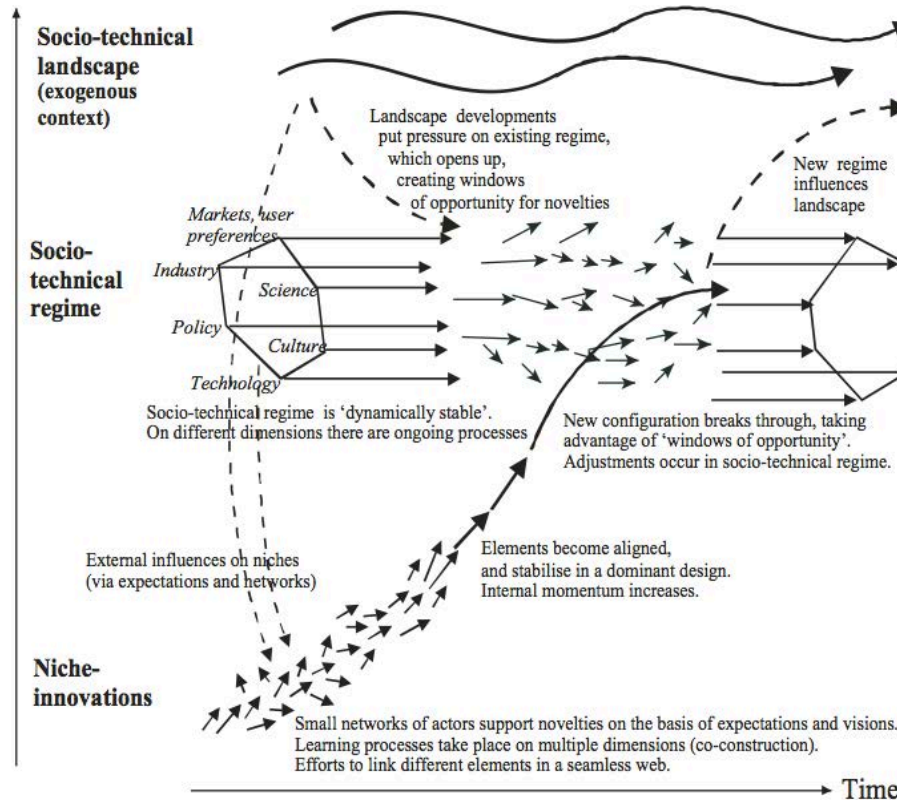


Source: Rathenau Institute, 1996

Towards sustainable transitions

Multi-level perspective on sustainability transitions within the socio-technical context: (Geels 2011)

Source: Geels, F. (2011) Multi-level perspective on sustainability transitions



Examples of sustainability transitions in mobile ICT:

New ideas



FAIRPHONE

Change in organizations



New product systems



SAMSUNG mobile take-back program

Recycling is the first step toward environmental protection. That is why Samsung Electronics has actively participated in a recycling program for end-of-life mobile devices. Through this program Samsung is leading the efforts to create a recycling based society where discarded products are reused as resources for manufacturing, and at the same time it is making great contributions to preserving the environment and using resources efficiently.

PLUG-IN TO eCYCLING WITH U.S. EPA

Samsung is a proud PLUG-IN to eCYCLING™ partner. Find out more on how you can recycle your cell phone at www.epa.gov/celphones. Recycle your cellphone. It's an easy call.

Recycle your unwanted goods

Every mobile phone, ink, laser or toner cartridge donated will mean a cash donation to us.
Please help support us and recycle today!

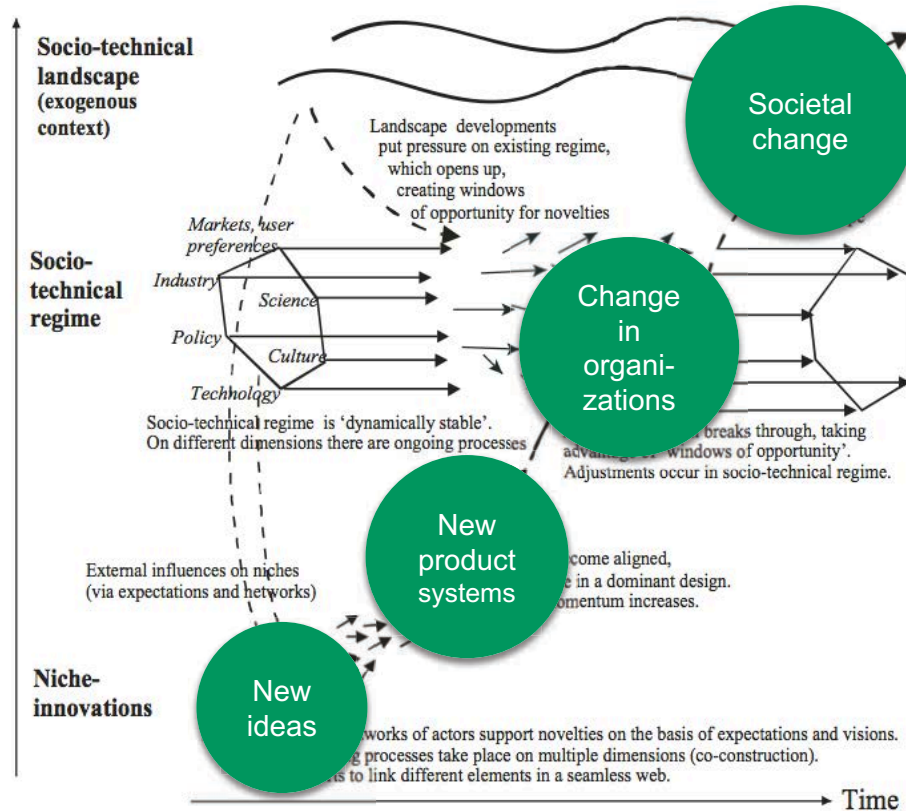
Green my Apple.

www.greenmyapple.org

Societal change

Towards sustainable transitions

Multi-level perspective on sustainability transitions within the socio-technical context: (Geels 2011)



Source: Geels, F. (2011) Multi-level perspective on sustainability transitions

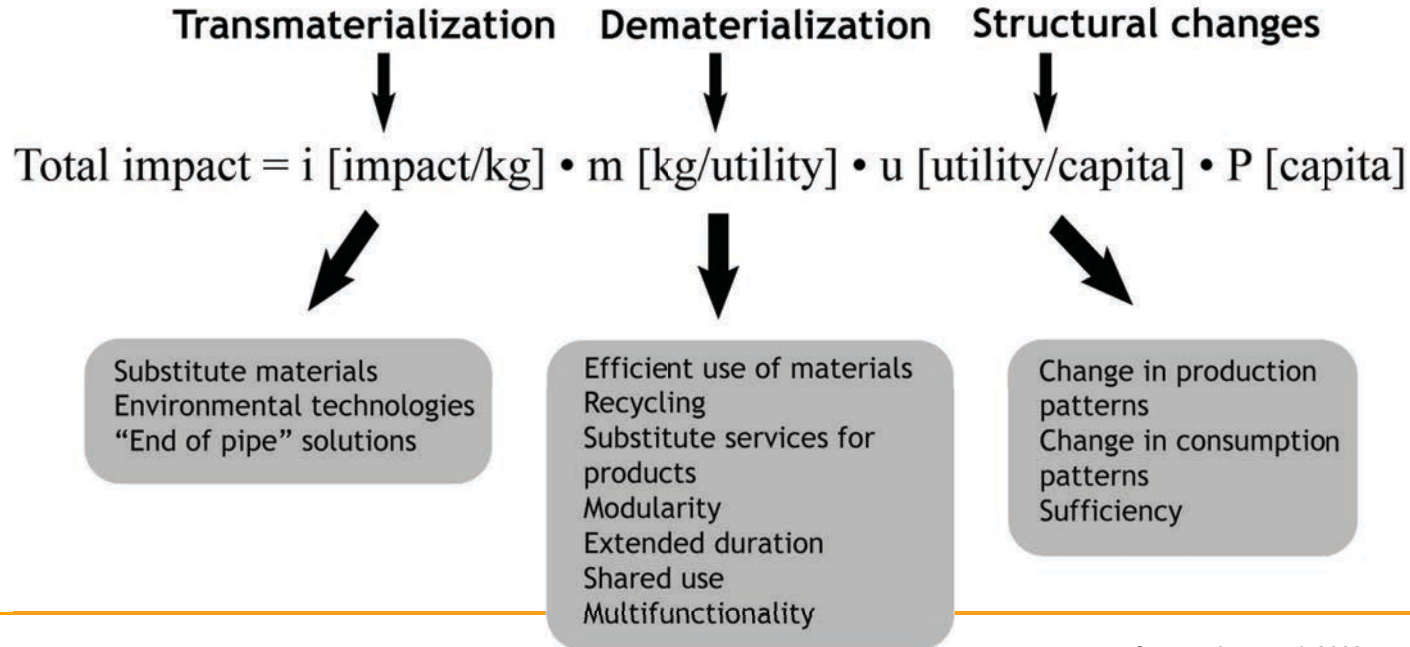
From products to systems and services



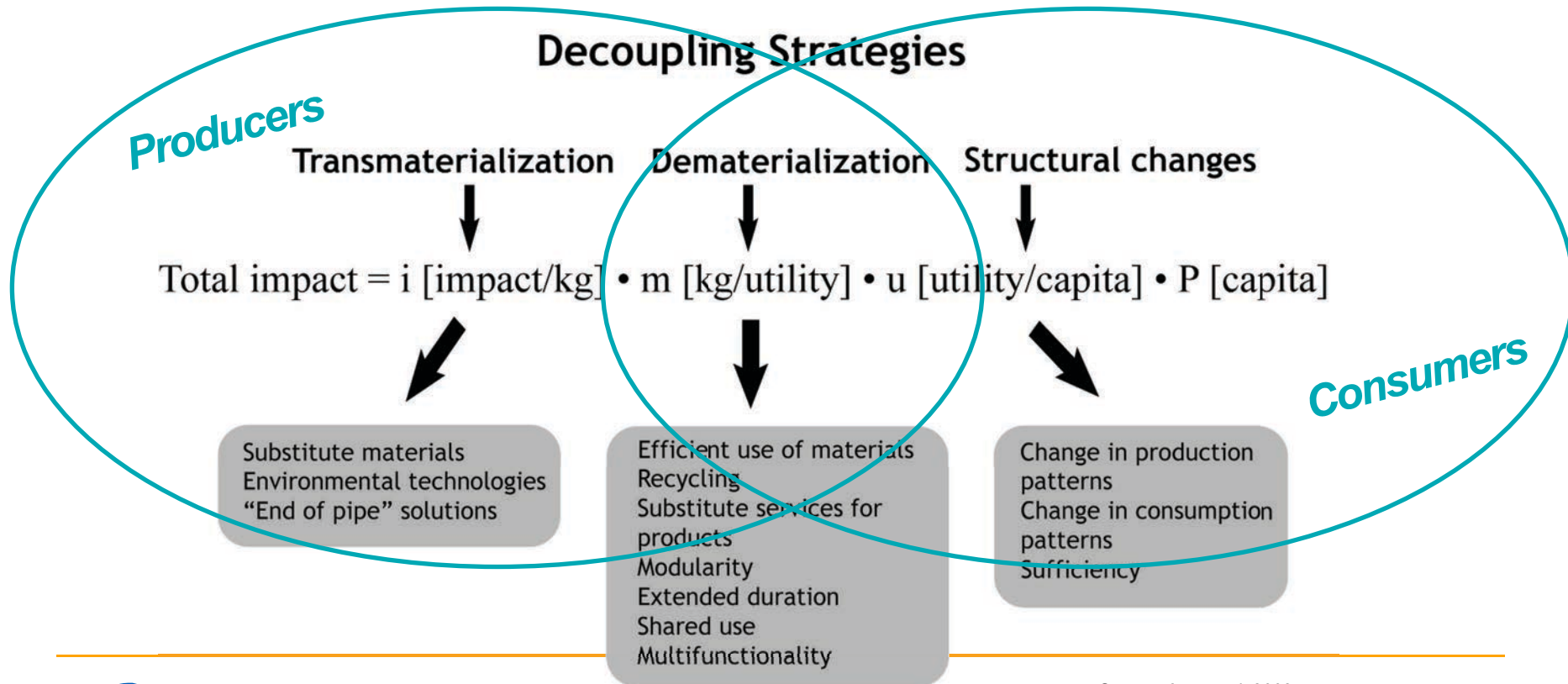
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Strategies for Sustainable Consumption and Production

Decoupling Strategies



Strategies for Sustainable Consumption and Production



Product-Service systems (PSS) design

Products as artifacts offer interfaces to functions and services they provide. Product-Service System (PSS) design moves the focus of design action towards the whole system of service provision, and systemic efficiency and/or value addition within it.

- Assessing impacts per service-unit rather than product
- Assessing 'system' sustainability

PSS design considers alternative business and service models that could provide improved sustainability by adjusting ownership and revenue models, and adding more stakeholders into the process.

- Changing product ownership: services instead of products
- Co-governance in design and management

Sustainable Product-Service systems

However: There are several types of PSS – not all PSS are by default sustainable!

(Tukker, A. 2004; Mont, O. 2001)

Three key elements in creating new, innovative, and sustainable PSS concepts:

- 1) Innovative stakeholders network;
- 2) A shift from selling products to selling results;
- 3) A change in product and resources ownership.

(Vezzoli, C. and Ceschin, F. 2008)

Switching from product sales to selling a functional result has most sustainability potential. Here, the provider agrees with the client the delivery of a result.

(Tukker, A. 2004)

Example: Selling office lighting in lux per meter (Philips) or clean air per cubic meter

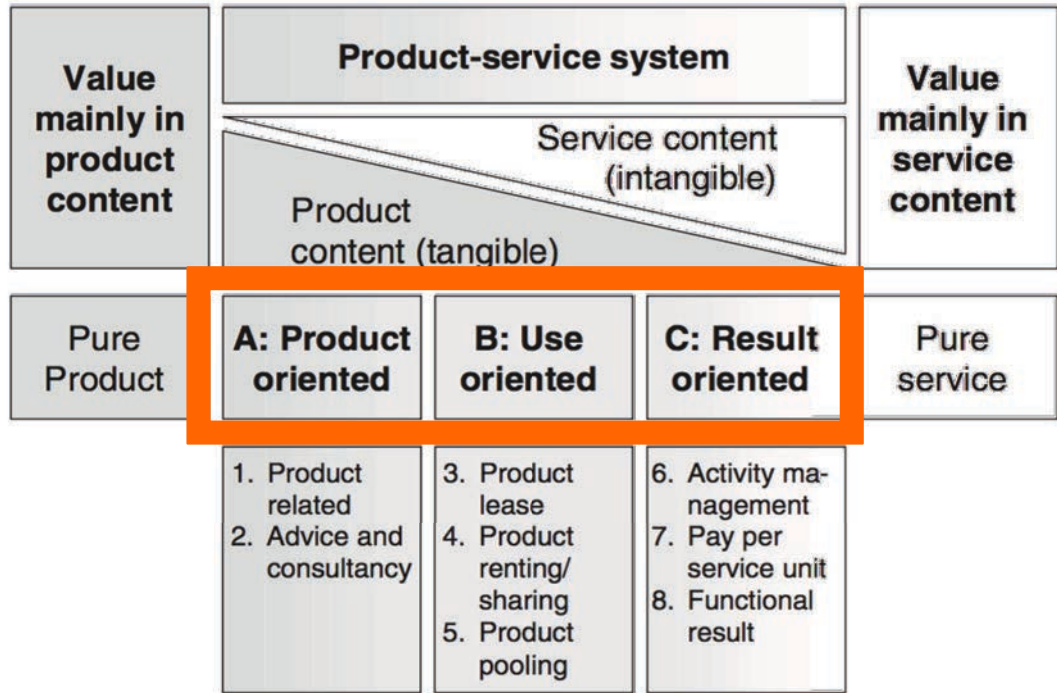


Figure 1. Main and subcategories of PSS

See: Tukker, A. 2004

Sustainable PSS: Examples

Product oriented:

Use oriented:

Result oriented:

Sustainable PSS: Examples

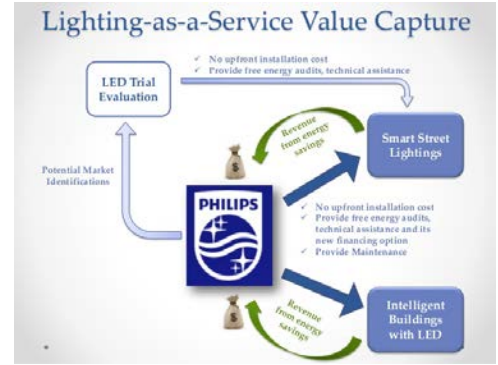
Product oriented:



Use oriented:

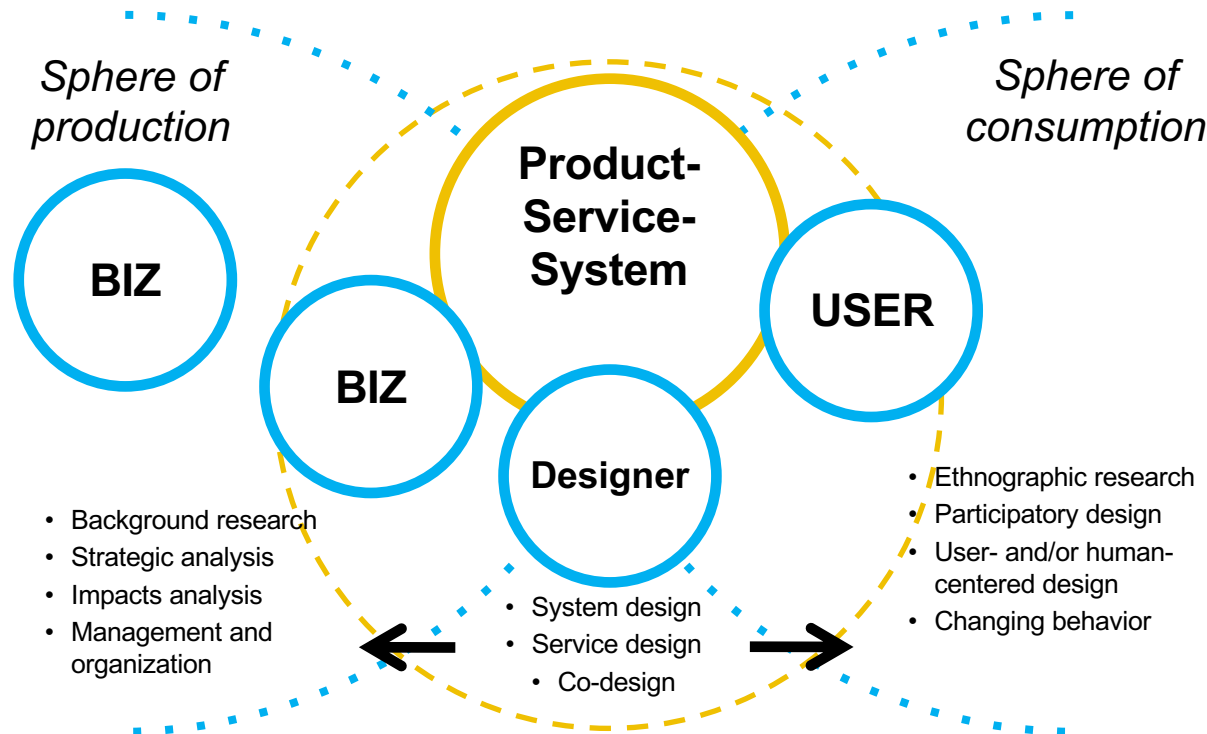


Result oriented:



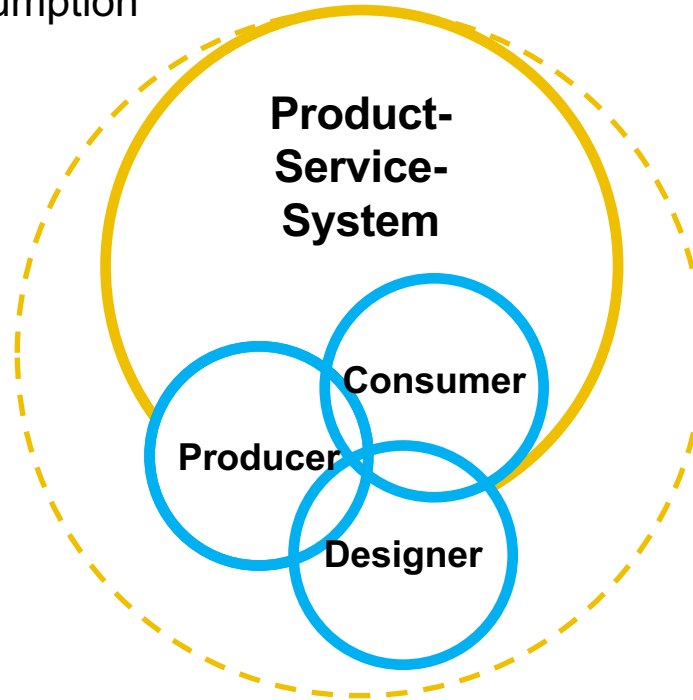
couchsurfing

Sphere of sustainable PSS design focus



Sphere of sustainable PSS design action

Sustainable consumption and production at the interplay of stakeholders:



Sustainable PSS:

- ✓ Functional results as a goal
- ✓ Expanded stakeholder network
- ✓ Sharing vision
- ✓ New roles for stakeholders
- ✓ Ownership into system processes and components

Sustainable PSS design – what & why?

WHAT & WHY:

- What is the demand? What is being offered & why?
- Strategic analysis & Exploring opportunities
- Existing research, checklists, “facts”
- Understanding the surrounding system; System mapping
- Identifying the potential (remember “low hanging fruits”)
- Environmental, socio-ethical and economic potential & needs
- What are the driving motivations, and how are they communicated?
- How to prioritize trade-offs?

Sustainable PSS design – how & who?

HOW & WHO:

- What is the improvement? What new stakeholder interactions can be created? What is the added value?
- Exploring opportunities; System ideation, development and design
- What is the offering to stakeholders (or system functions)?
- Who are the main actors? Who are the other stakeholders?
- What are the interactions? System & stakeholder mapping...
- What are the system boundaries (primary & secondary)
- How is the design process set up?
- How is communication set up?

Sustainable PSS design – test & iterate!

TEST & ITERATE:

- Take PSS concept in real life setting & testing
- System implementation and iteration
- Socio-technical experimenting
- Environmental, socio-ethical and economic assessment
- Communication between societal domains & actors
- Develop & iterate collaboratively with stakeholders!
- Scale up from experiment...

Sustainable PSS design process

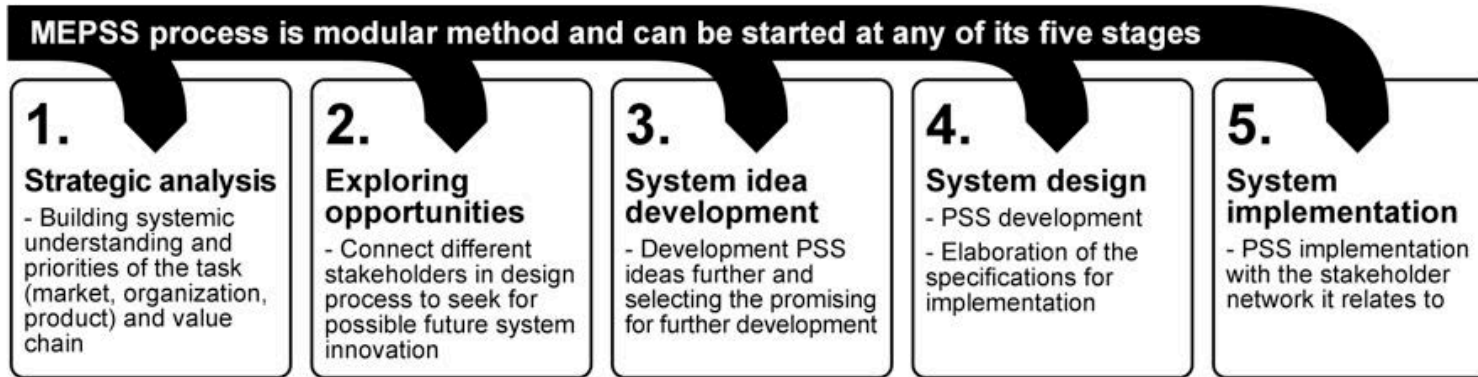


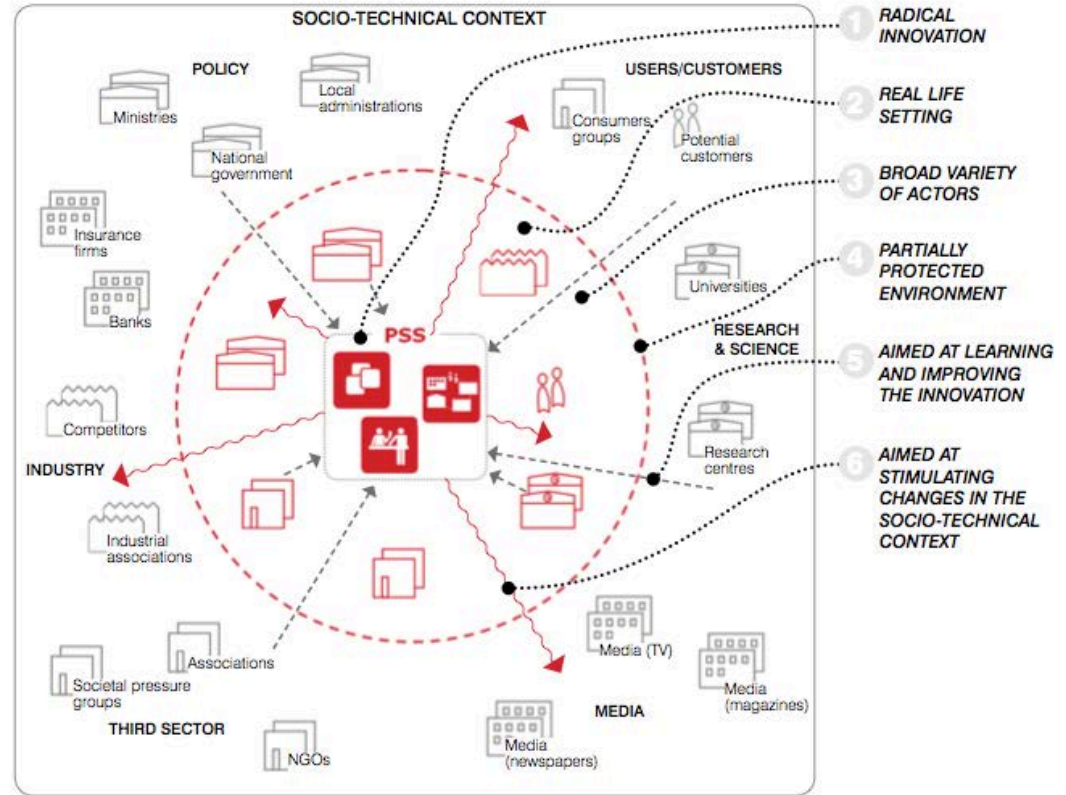
Figure 1. MEPSS design process and its five stages (based on Van Halen, C. et al. 2005; Vezzoli, C. 2007).

Communicating results

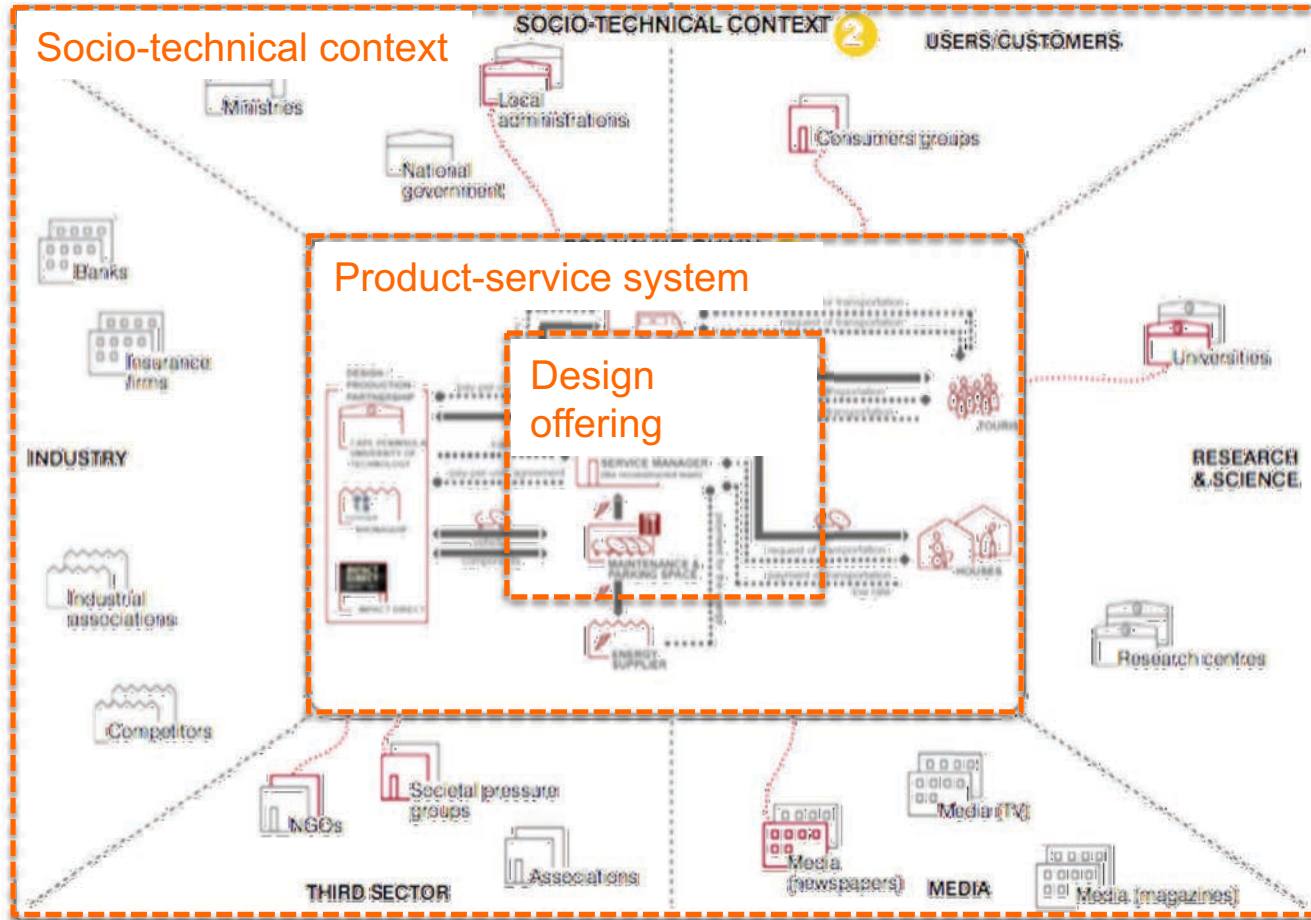
Designer as the match-maker

Design action can focus to:

- Redesigning system interactions and connections
- Connecting new stakeholders within the problem context
- Communicating system interaction and value propositions



Identifying connections within the socio-technical context:



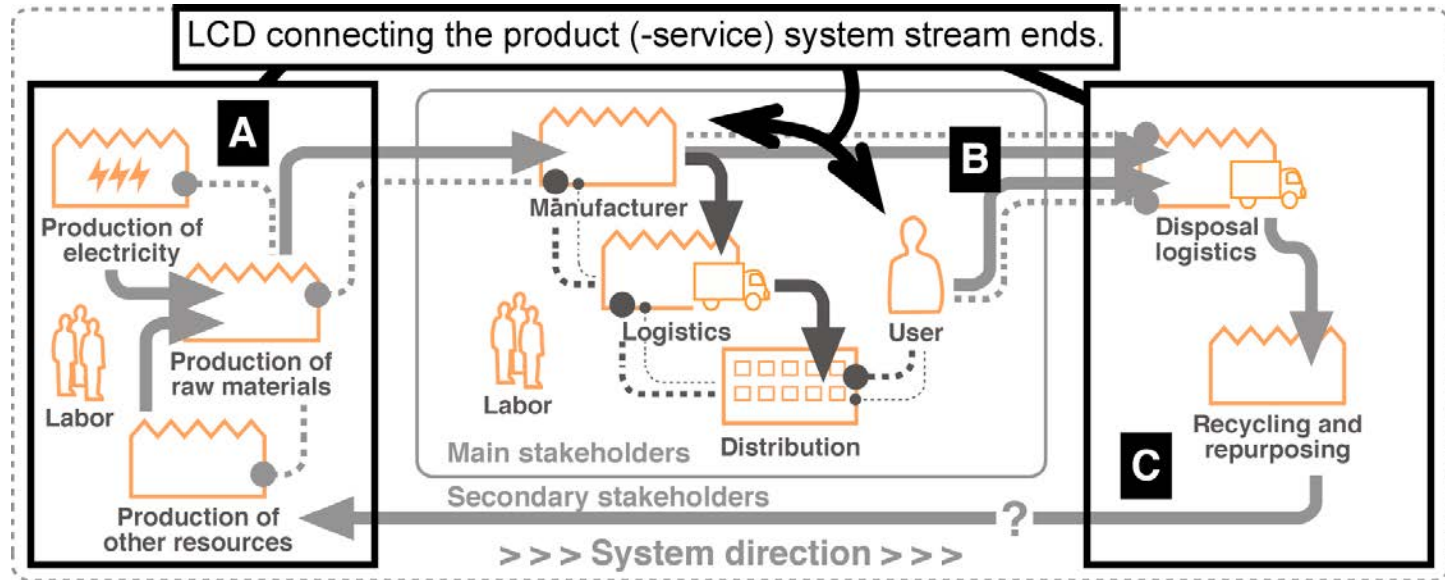
Communicating
the offering from
user perspective:



Part of the detailed Offering Diagram that visualises the whole offering

Offering Diagram showing the basic and added-value functions of the design idea

Communicating production system and system of use, and novel stakeholder & system interactions:



Source: Author, 2014

Communicating business value:

The Business Model Canvas

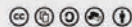
Designed for:

Designed by:

Date:

Version:

<h3>Key Partners</h3> <p>Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?</p> <p>EXAMPLES Partnerships for distribution Joint ventures and alliances Acquisition of key capabilities Acquisition of particular resources and activities</p>	<h3>Key Activities</h3> <p>What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue creation?</p> <p>EXAMPLES Production Project delivery Platform/network</p>	<h3>Value Propositions</h3> <p>What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment? Which customer needs are we satisfying?</p> <p>EXAMPLES Newness Performance Reliability Customization "Convenience" (Saving the "Job Done") Design Brand/Status Price Risk Reduction Access Convenience/Usability</p>	<h3>Customer Relationships</h3> <p>What type of relationship does each of our Customer Segments expect us to establish, AND maintain with them? Which ones have we established? How are they integrated with the rest of our Business Model? How costly are they?</p> <p>EXAMPLES Personal assistance Self-Service Automated Personal Assistance Self-Service Automated Services Communities Co-creation</p>	<h3>Customer Segments</h3> <p>For whom are we creating value? Who are our most important customers?</p> <p>EXAMPLES Mass Market Niche Market Segmented Demographic Multi-sided Platform</p>
	<h3>Key Resources</h3> <p>What Key Resources do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?</p> <p>EXAMPLES Physical Intellectual (Brand, patents, copyrights, data) Human Financial</p>		<h3>Channels</h3> <p>Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?</p> <p>EXAMPLES A. Awareness How do we raise awareness about our company's products and services? B. Evaluation How do we help customers evaluate our organization's Value Proposition? C. Purchase How do we allow customers to purchase specific products and services? D. Delivery How do we deliver a Value Proposition to customers? E. After sales How do we provide post-purchase customer support?</p>	
<h3>Cost Structure</h3> <p>What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?</p> <p>FIXED COSTS Cost of raw materials, cost of production, labor and other physical inputs, production automation, external outsourcing Fixed costs (Rent, salaries, equipment, purchase value amortization)</p> <p>VARIABLE COSTS Cost of goods sold (materials, direct labor, utilities) Variable costs Economies of scale Economies of scope</p>		<h3>Revenue Streams</h3> <p>For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Stream contribute to overall revenue?</p> <p>ASSETS Brand List price Design fee Subscription fees Licensing/brand/usage Licensing Advertising</p> <p>VALUE PROPOSITION List Price Product/Feature Alignment Customer segment dependent Volume dependent</p> <p>CHANNELS Reseller (Buyer/Seller) Word of Mouth New time stream</p>		



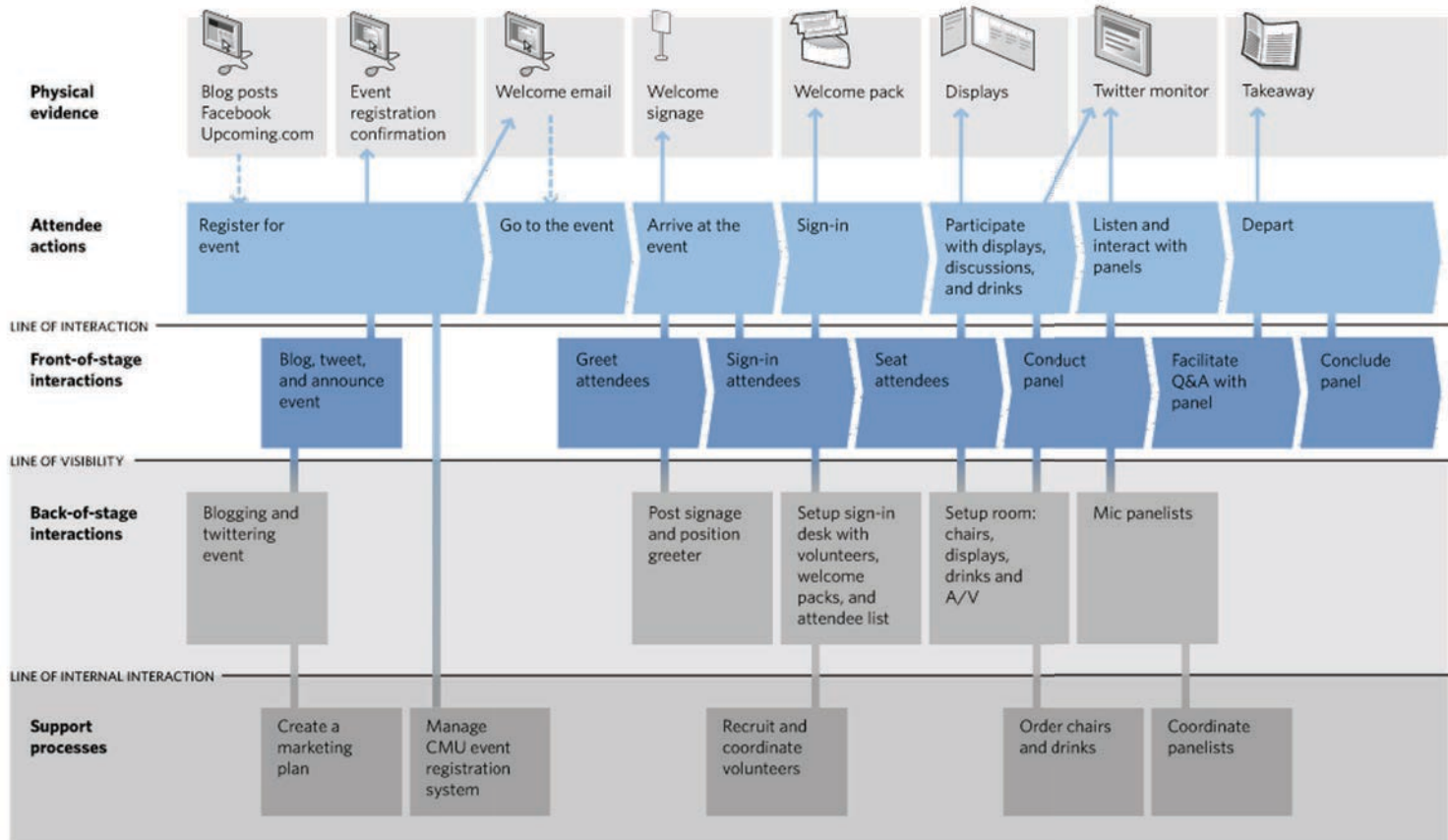
DESIGNED BY: Business Model Foundry AG
The makers of Business Model Generation and Strategyzer

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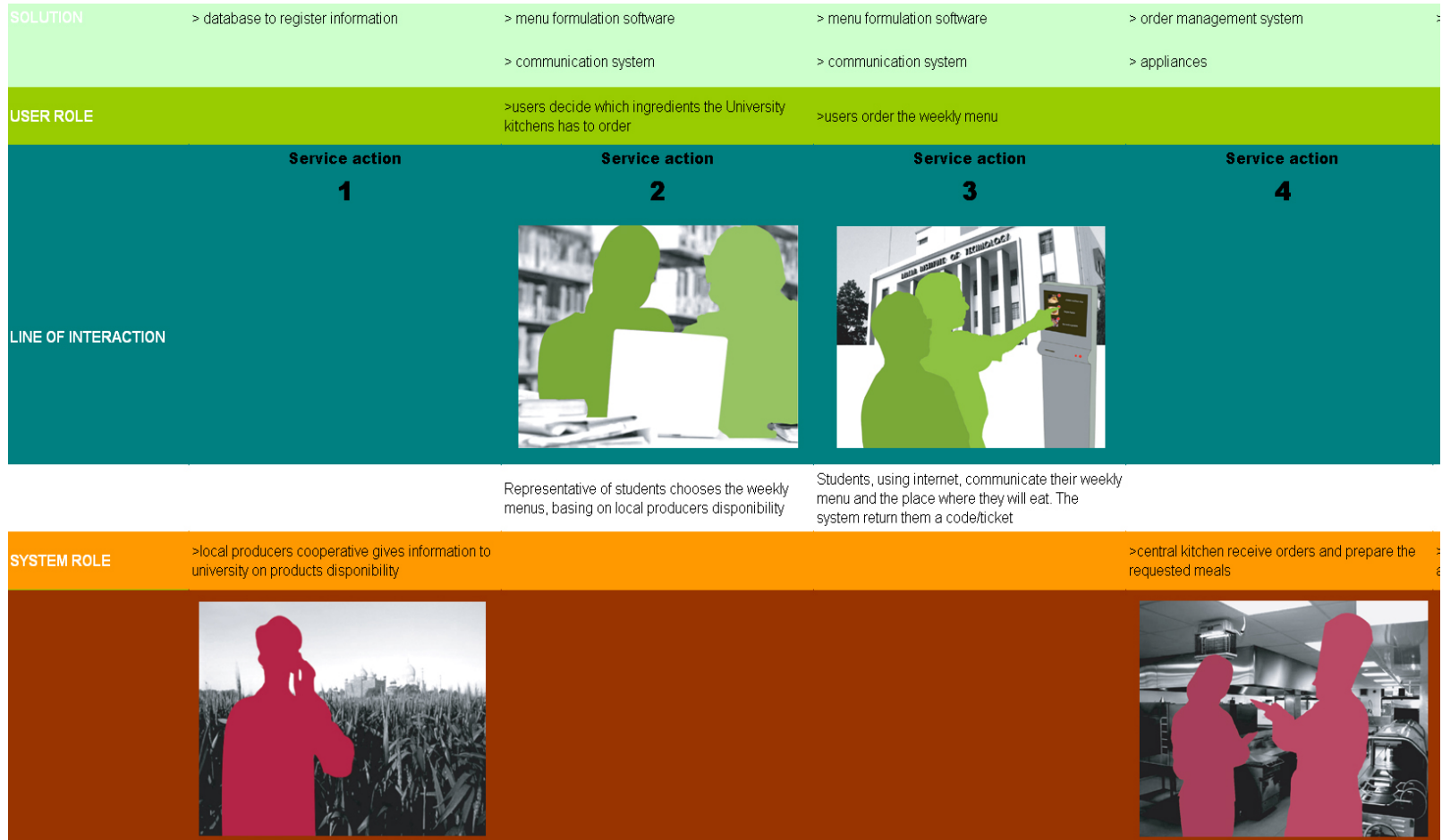
Communicating 'service blueprint':

Service Blueprint for Seeing Tomorrow's Services Panel

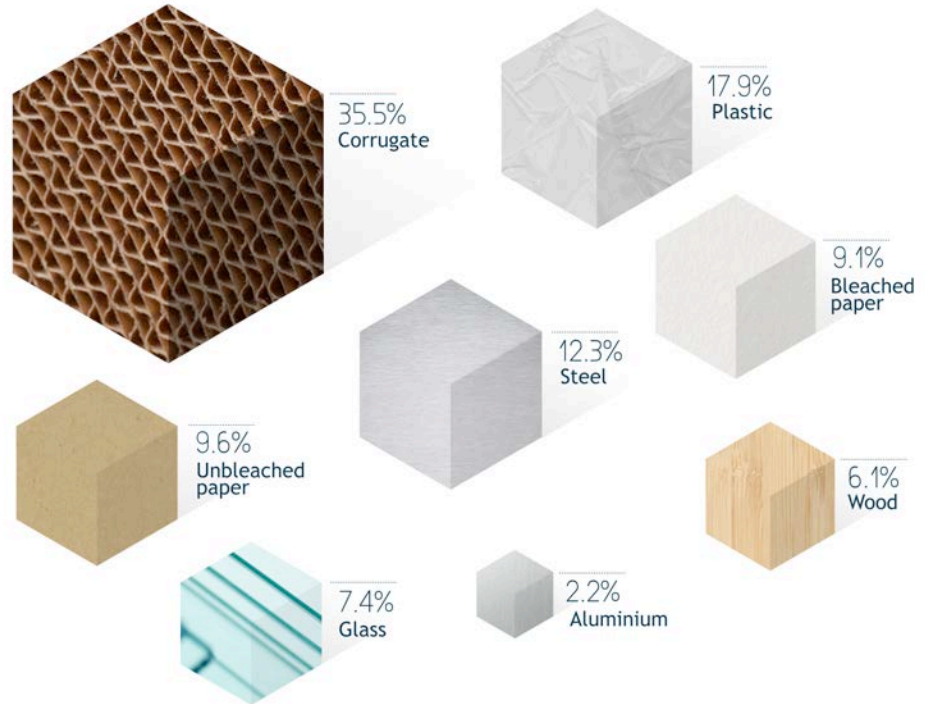
find out more: <http://upcoming.yahoo.com/event/1768041>



Communicating system interactions with storyboards:



Not forgetting new material innovations!



Exercises



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In-class exercise in groups:

Random groups in breakout rooms, 15 mins group discussion:

- Based on your topic (below), find out a real-world example, or ideate a new one...
- What is the focus service offering in your example case?
- Who are the main stakeholders in the system? How are interactions designed?
- Explain your choice briefly after discussion

Case topics for each group:

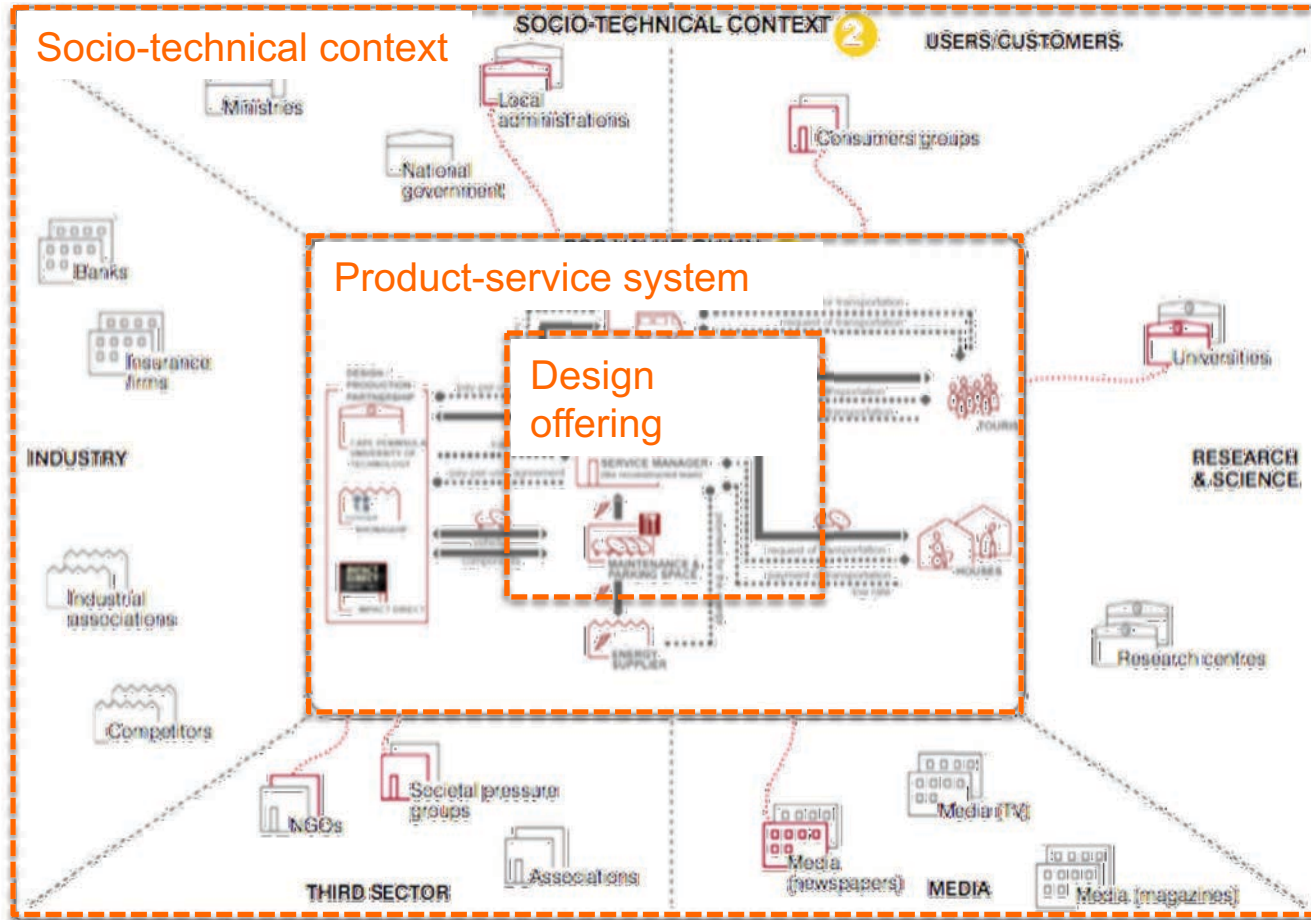
1. ICT services
2. Mobility services
3. Tools and appliances
4. Tourism services
5. Food-related services
6. Spaces for shared use
7. Open-source data
8. Housing services

Home exercise in product case groups:

Continue in your product case groups, and prepare for next week tutor discussions:

- What is the focus service offering in your case? What is the 'sustainability offering' in your case? Can you expand the offering or redesign it?
 - Who are the main stakeholders in your product-service system? Can you introduce new actors and interactions?
 - How are interactions designed? Can they be redesigned?
 - Can you introduce changes to your product system to improve it: increase sustainability through improved system or with a novel component with additional value?
-
- Consider core offering(s), map your PSS, create innovative redesign!
 - Explain your idea(s) in next week tutoring meeting

Identifying connections (and promoting sustainability) within the context of action:



Thank you!



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