Design Approaches to Sustainable Consumption

Session 4 (Thursday 18.1.): Systems design and Sustainable Product-Service-System (PSS) design

Tatu Marttila
Thursday 18.1.2024

Agenda

9:15–9:30   **Project work & group check-up**

9:30–10:00   **Systems focus in design**

10:15–11:00   **PSS methods and tools**

11:00–11:45   **Group exercise**

11:45–12:00   **Concluding session**

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Course and project work schedule

Please note the change in location for several sessions to A-Grid Mordor!

Working days	Tuesdays (13-17)	Thursdays (9:15-12)
Week 1 (9.1 & 11.1.)	Introduction to course; DfS introduction (F101)	Designing for sufficiency (visitor: Mikko Jalas) (Q201)
Week 2 (16.1. & 18.1.)	**Project work: Kick-off** (A-Grid Mordor)	Sustainable PSS design & systems design (Q201)
Week 3 (23.1. & 25.1.)	Socio-technical experimentation & social innovation (F101)	**Presenting case work ideas** (A-Grid Mordor)
Week 4 (30.1. & 1.2.)	Design for sustainability transitions (Q201)	Communicating and scaling-up sustainability (visitor: Michael Lettenmeier) (A-Grid Mordor)
Week 5 (6.2. & 8.2.)	Sustainability games (visitor: Tommi Vasko) (A-Grid Mordor)	**Project work tutoring & finalisation** (Q101)
Week 6 (13.2. & 15.2.)	**Project work: Final presentations** (F101)	Feedback session (A-Grid Mordor)

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Project work initiation

- **Structure your schedule and group meetings; Agree on first steps and divide work**

- Begin by site assessment and by considering potential areas of intervention for your theme: Consider your overall theme, and think of the related materials, products, product-systems, involved practices of consumption and production, and the potential changes towards sustainability

- Begin initial ideation and brainstorming for your design concept idea…

- Begin to gradually also think about idea presentations on next week Thursday!

- *How has the work started – any immediate issues, concerns, questions?*

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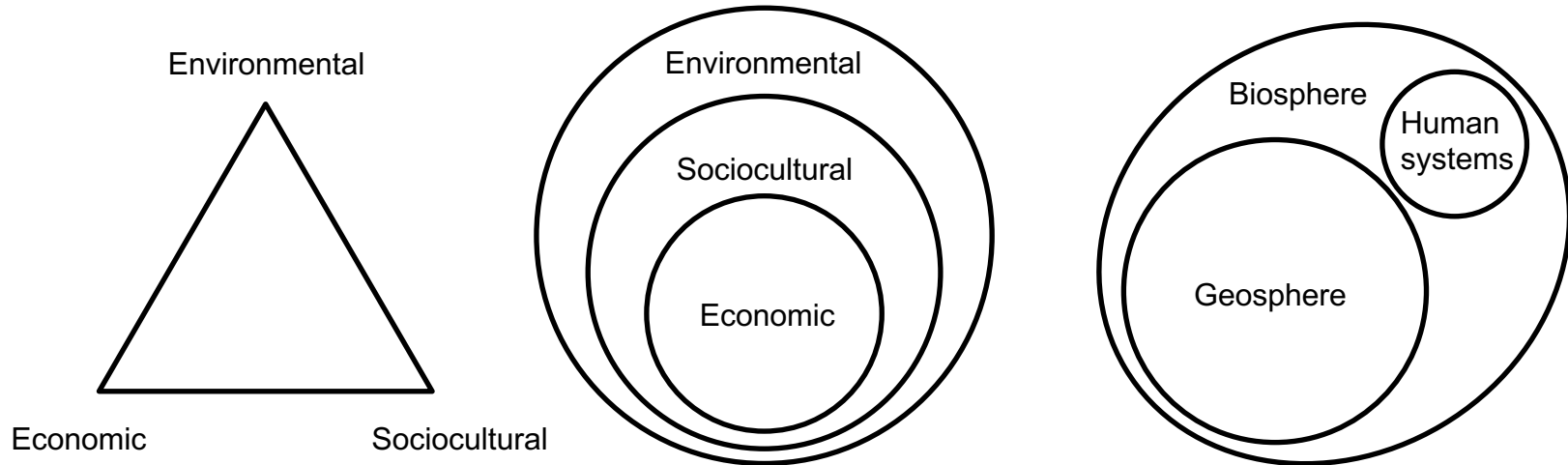**School of Arts, Design**
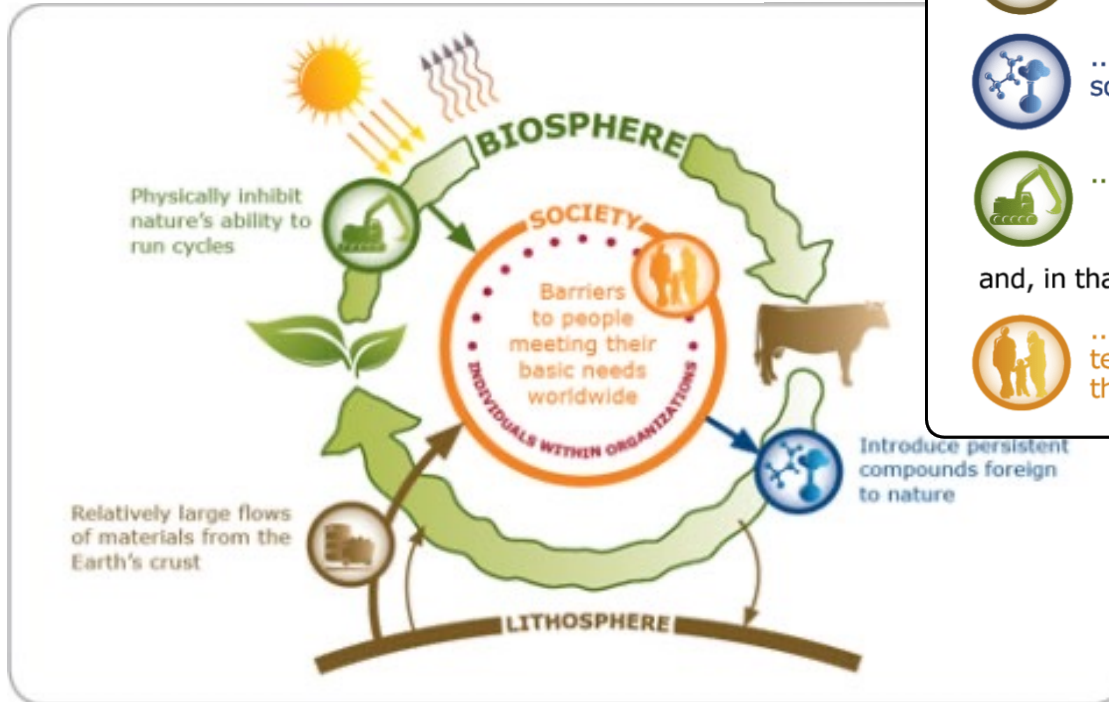**and Architecture**

Project work status?

Systems focus in design

Different models to discuss sustainability

Different conceptual/systemic approaches to sustainability: *Triple-bottom line perspective (Elkington, 1994), nested model (IUCN), and a model that is not anthropocentric.*

The Natural Step – principles for sustainable design:

In a sustainable society, nature is not subject to systematically increasing...
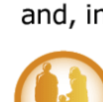
...concentrations of substances extracted from the Earth's crust,

...concentrations of substances produced by society,

...degradation by physical means,

and, in that society...

...people are not subject to conditions that systematically undermine their capacity to meet their needs.

See: https://thenaturalstep.org/approach/

Sustainable Development Goals
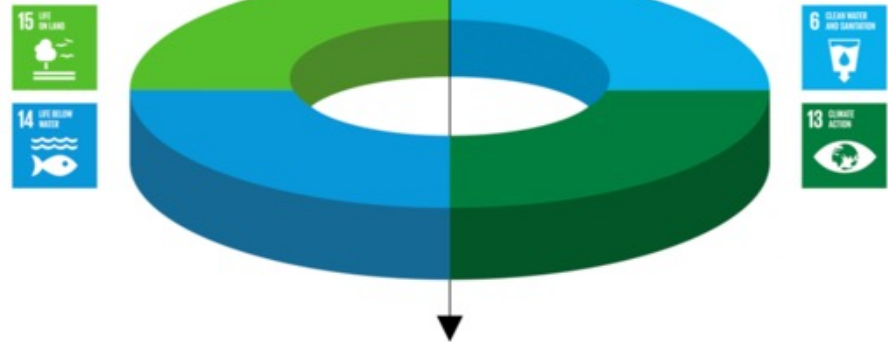
The SDG 'wedding cake'. Source: Stockholm Resilience Institute.

Systems Strategy Model for sustainable desing:

(Shedroff, 2009)

Source: Shedroff, 2009
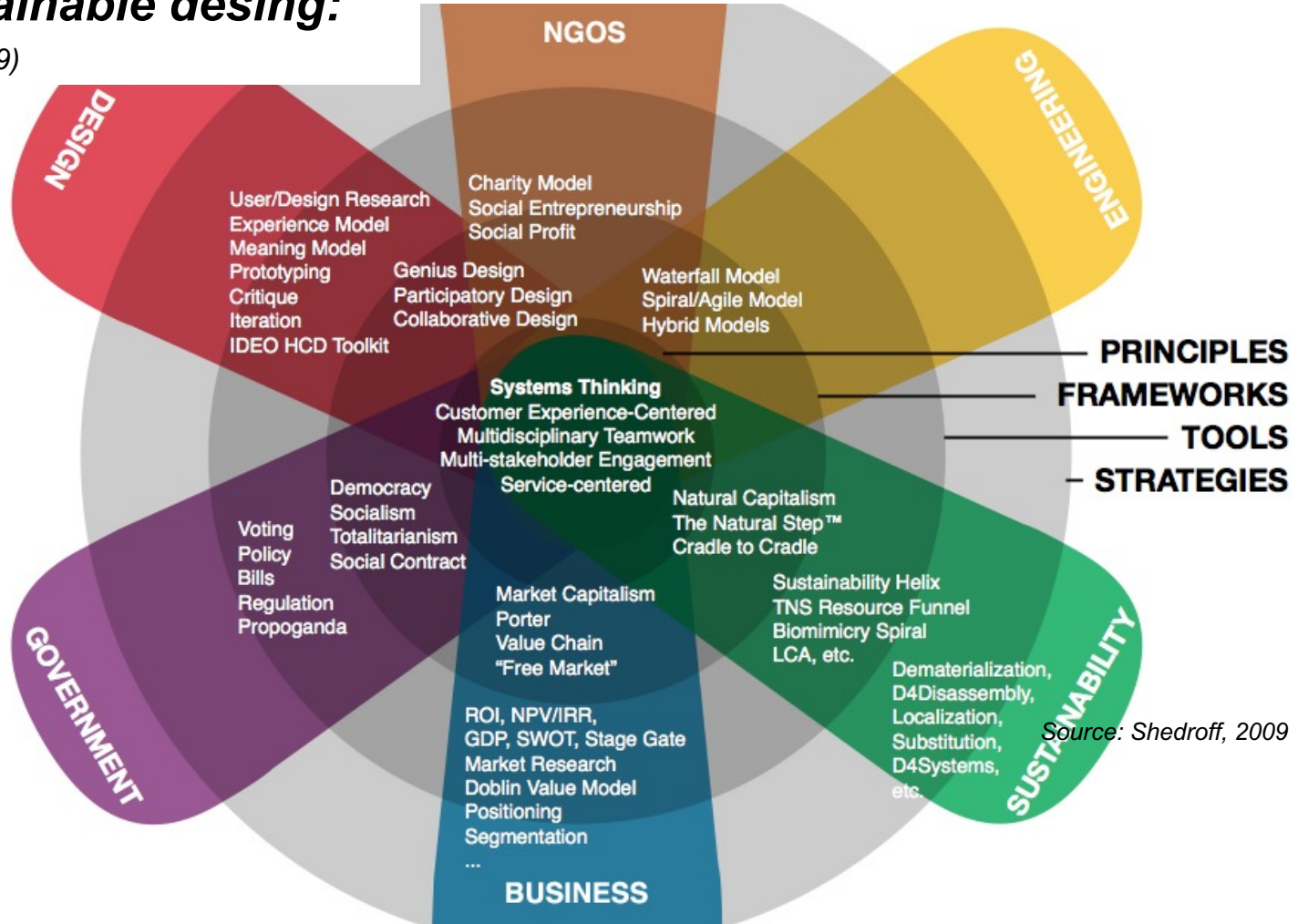
Circular economy & system design
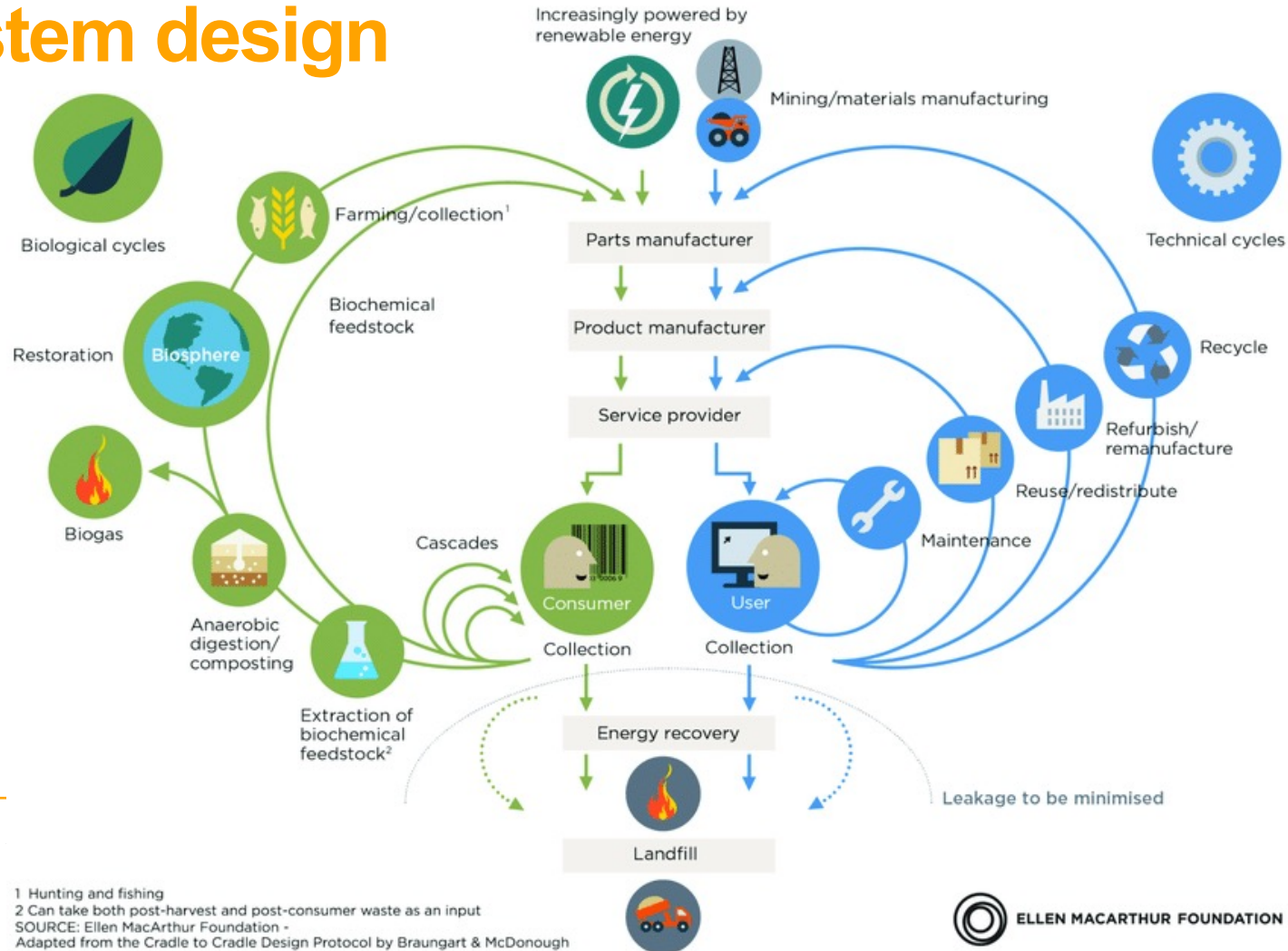
1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input
SOURCE: Ellen MacArthur Foundation -
Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

System rebounds to increased consumption?
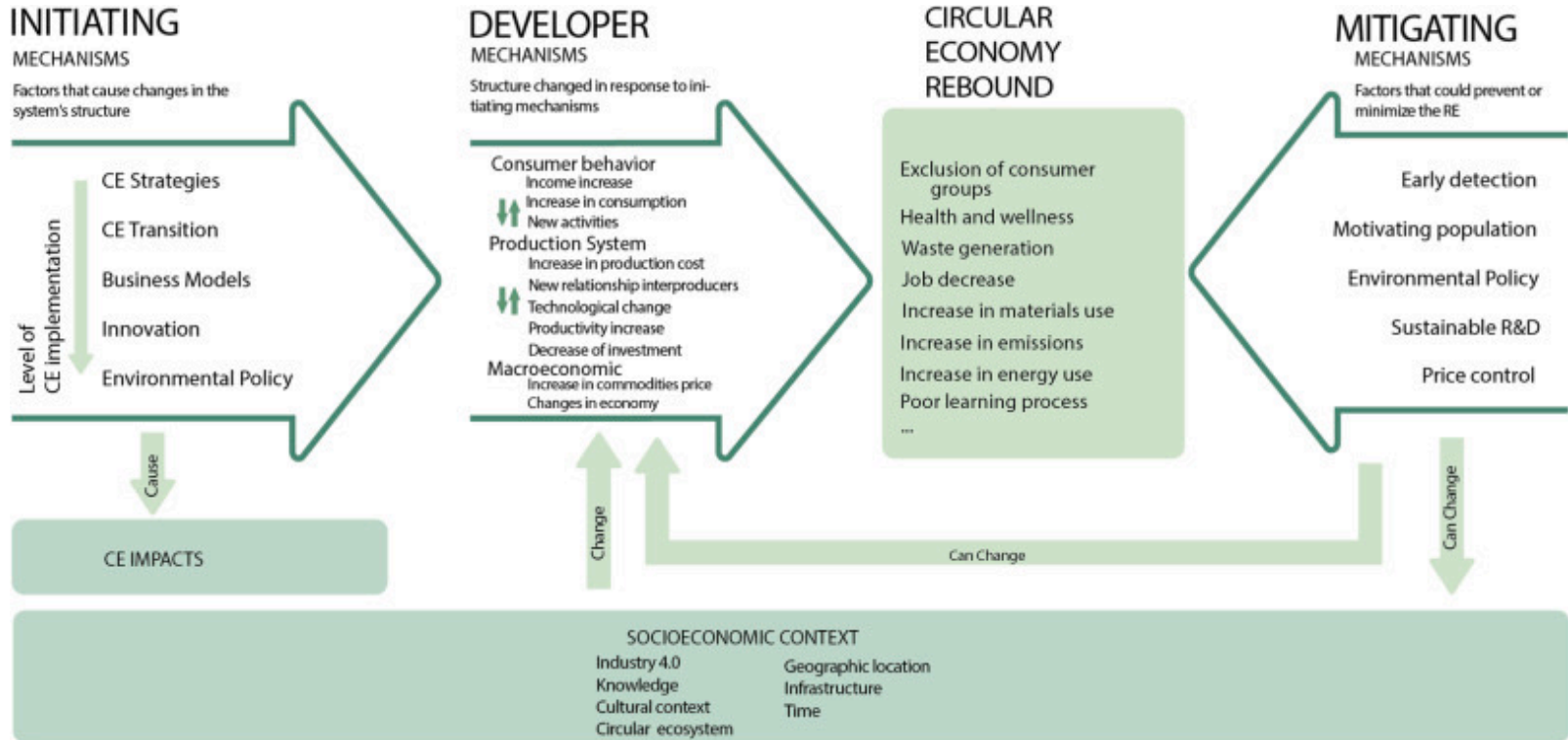
Socio-technical systems and sustainability transitions

Transition Management (TM) methodology is based on a *multi-level perspective* on sustainability transitions within the socio-technical system context, with focus on:

- **Macro-level (landscape)**

- **Meso-level (regimes)**

- **Micro-level (niches)**

Long-term, slow changes

Socio-technical landscape

pressure

Socio-technical regime

Mainstream practices (business, research, governance, markets)

pressure

Niche innovations

Niche innovations (new social practices, technologies, business models etc)

Figure 11.1 The MLP of system innovations model
Source: Adapted from Geels (2005a, 2005b) and Geels & Schot (2007).

9.1.2024

13

The dynamics of socio-technical change:

Macro: Evolving sociotechnical landscapes

Meso: A patchwork of regimes

Micro: novel configurations

[1] Novelty, shaped by existing regime
[2] Evolves, is taken up, may modify regime
[3] Landscape is transformed

Fig. 4. The dynamics of sociotechnical change (Rip and Kemp, 1996; Kemp et al., 2001).

LANDSCAPE
Megatrends, perceptions, mindsets

REGIME
The everyday use of technology
(design, context, practice)

NICHE
New ideas and innovations

Multilevel focus for design

Multilevel perspective adapted to design:

"The role of designers is broadening, from the creators of physical arte-facts to the potential role of facilitators of complex societal change processes. To support the widening role of the designer, there is a need for a design supportive model."

Multilevel Design Model (MDM) by Joore & Brezet (2014)
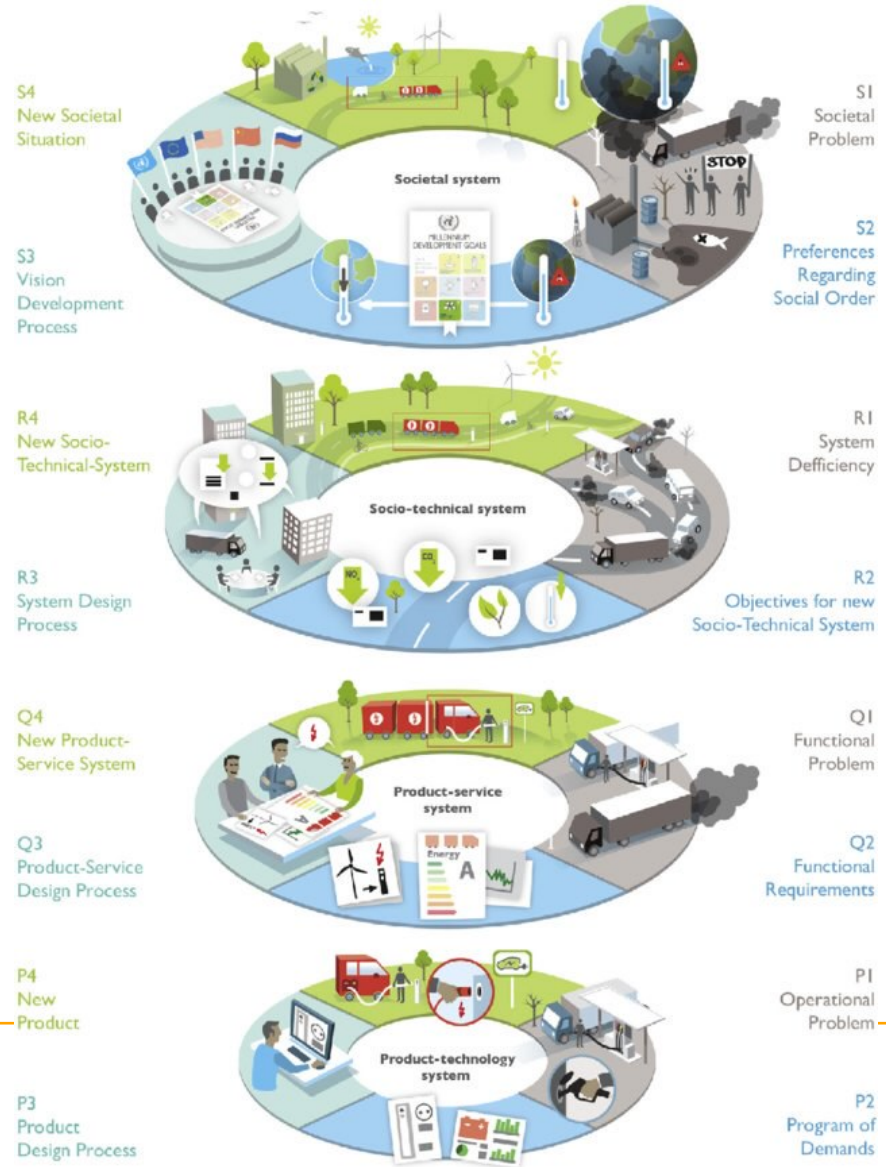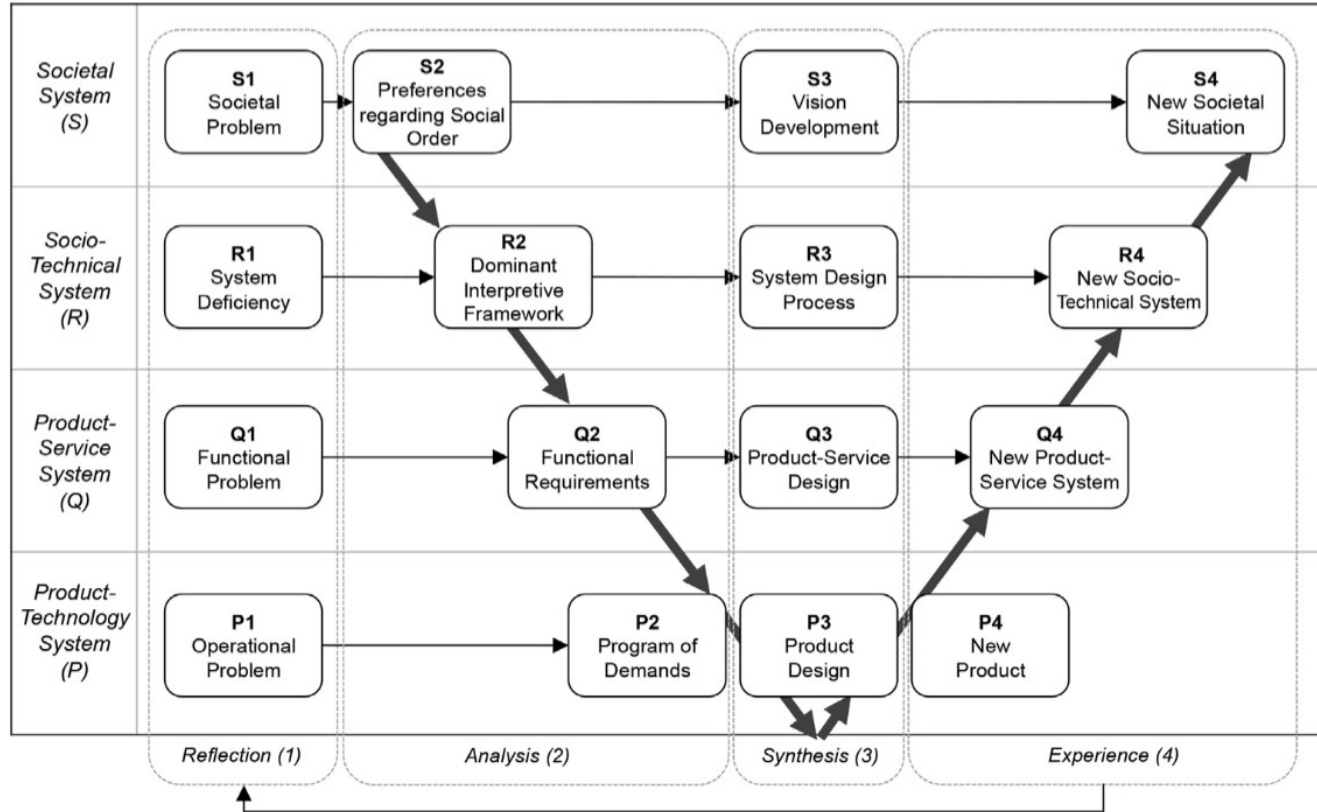
Fig. 2. Multilevel Design Model (Linear representation).

Types of leverage points in the system:

(Meadows, 1999)

The power to shift paradigm to deal with new challenges
The paradigm used to design the system
The System Goal
System structure/self organization
System rules
Information flow structures
Reinforcing feedback loops
Balancing feedback loops
Delays relative to change rates
Stocks and flow structures
Buffer sizes
Constants, parameters, numbers

System

Types of leverage points in the system:

(Meadows, 1999)

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System rules

Information flow structures

Reinforcing feedback loops

Balancing feedback loops

Delays relative to change rates

Stocks and flow structures

Buffer sizes

Constants, parameters, numbers

System

Parameters
Mechanistic parameters often in focus of policy

Feedbacks
Dynamics between system elements

Design
System structure, institutions, rules

Intent
Values, goals, world views

Source: https://ecowe.wordpress.com/2013/02/13/leverage-points-places-to-intervene-in-a-system/

Experience (4)

S4 - New Societal Situation | S0 - Starting Position

Synthesis (3)

S3 Vision Development

Societal System (S)

S1 Societal Problem

Reflection (1)

S2 - Preferences regarding social order

Analysis (2)

R4 - New Socio-Technical System | R0 - Starting Position

R3 System Design Process

Socio-Technical System (R)

R1 System Deficiency

R2 - Dominant Interpretive Framework

Q4 - New PSS | Q0 - Starting Position

Q3 PSS Design

Product-Service System (Q)

Q1 Functional Problem

Q2 - Functional Requirements

P4 - New Product | P0 - Starting Position

P3 Product Design

Product-Technology System (P)

P1 Operational Problem

P2 - Program of Demands

Consider all levels and also how to leverage tranformation with your design!

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Joore & Brezet (2014). "A Multilevel Design Model – The Mutual Relationship between Product-Service System Development and Societal Change Processes"; As an optional reading in MyCourses!

From products to systems and services

Product-service-system (PSS) design

Product-Service System (PSS) Design for Sustainability

Based on the model of functional economy (Stahel, 1997), Product-Service System (PSS) Design considers products as interfaces to larger product-service systems, and moves the focus towards systemic efficiency in access to the services that products provide.

Endorsed also by the UNEP (2002), **sustainable PSS design considers alternative business and service models** that could provide improved sustainability by adjusting ownership and revenue models, and by adding more stakeholders to the process.

➢ *PSS enables systemic improvement and more efficient access to services that products offer*
➢ *PSS enables changes product ownership models; Offering access to services instead of products*
➢ *PSS adds value to stakeholder network; Potential co-governance in design, production and management*

Stahel, R.W. (1997). "The Functional Economy: Cultural Change and Organizational Change", in Richards, D.J. *The Industrial Green Game.* Washington: National Academic Press.

UNEP (2002). *Product-Service Systems and Sustainability: Opportunities for Sustainable Solutions.* Paris: United Nations Environment Programme.

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Product-Service System (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.

➢ Assess impacts per service-unit rather than product
➢ Assess and enhance 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

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Different types of PSS solutions

PSS design is a perspective to designing any product or service. However, there are different types of PSS depending on how and where the value is created.

- **Product oriented PSS** focuses mainly to extend the existing product-offering

- **Use oriented PSS** covers various models of leasing/sharing/pooling of products

- **Result oriented PSS** focuses to deliver a (novel) service with a 'functional result' (i.e., satisfy user need without product/material ownership)
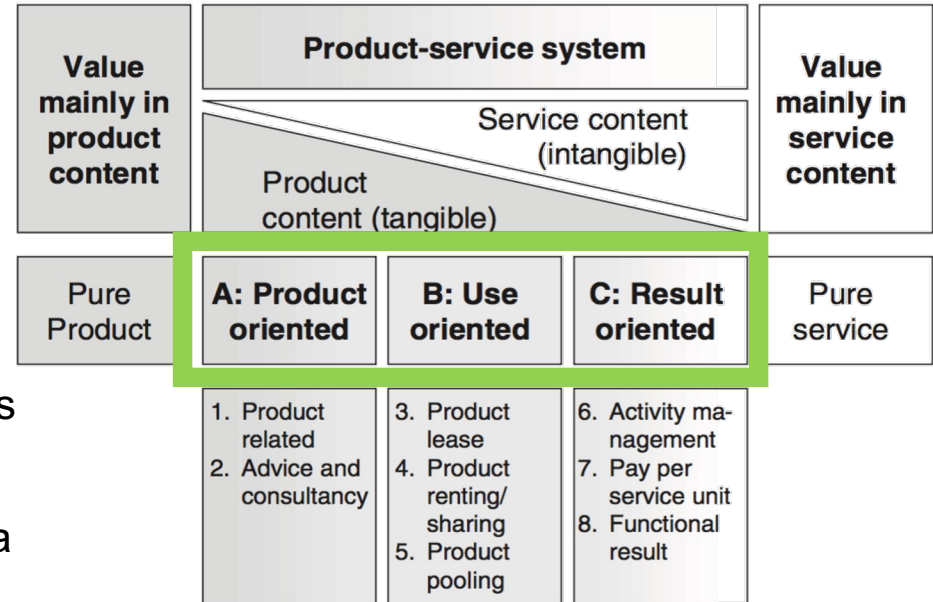

Figure 1. Main and subcategories of PSS

Figure based on Tukker, A. (2004). "Eight types of product–service system: eight ways to sustainability? Experiences from SusProNet." *Business Strategy and the Environment* (13/4). https://doi.org/10.1002/bse.414

Sustainable Product-Service Systems

However: There are several types of PSS – not all PSS are 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

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Examples of PSS designs

Product oriented:　　　　　**Use oriented:**　　　　　**Result oriented:**

Examples of PSS designs

Product oriented: **Use oriented:**   **Result oriented:**

Mobile Phone Take-back
Got an old phone lying around?
Recycle it!

We Repair MOBILE PHONES
FROM WATER DAMAGE, TO CRACKED SCREENS AND LOTS MORE

Examples of PSS designs

Product oriented:

Use oriented:

Result oriented:

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Examples of PSS designs

Product oriented:

Use oriented:

Result oriented:

Product-service system (PSS) for sustainable consumption

Products as 'service-producing machines' – we do not need the products, but the services they provide!

Organise markets and consumption differently:
- 'Access-based consumption'
- Mobility-as-a-Service (MaaS)
- Energy performance contracts (EPC)
- Service businesses; Service-orientation, 'servicizing'

Connect to and support non-market activity:
- Supporting grassroots; Social innovation
- Sharing and learning
- DIY and collaborative making

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Sphere of sustainable PSS design focus

Sphere of production

Sphere of consumption

Product-Service-System

BIZ

BIZ

USER

Designer

- Background research
- Strategic analysis
- Impacts analysis
- Management and organization

- System design
- Service design
- Co-design

- Ethnographic research
- Participatory design
- User- and/or human-centered design
- Changing behavior
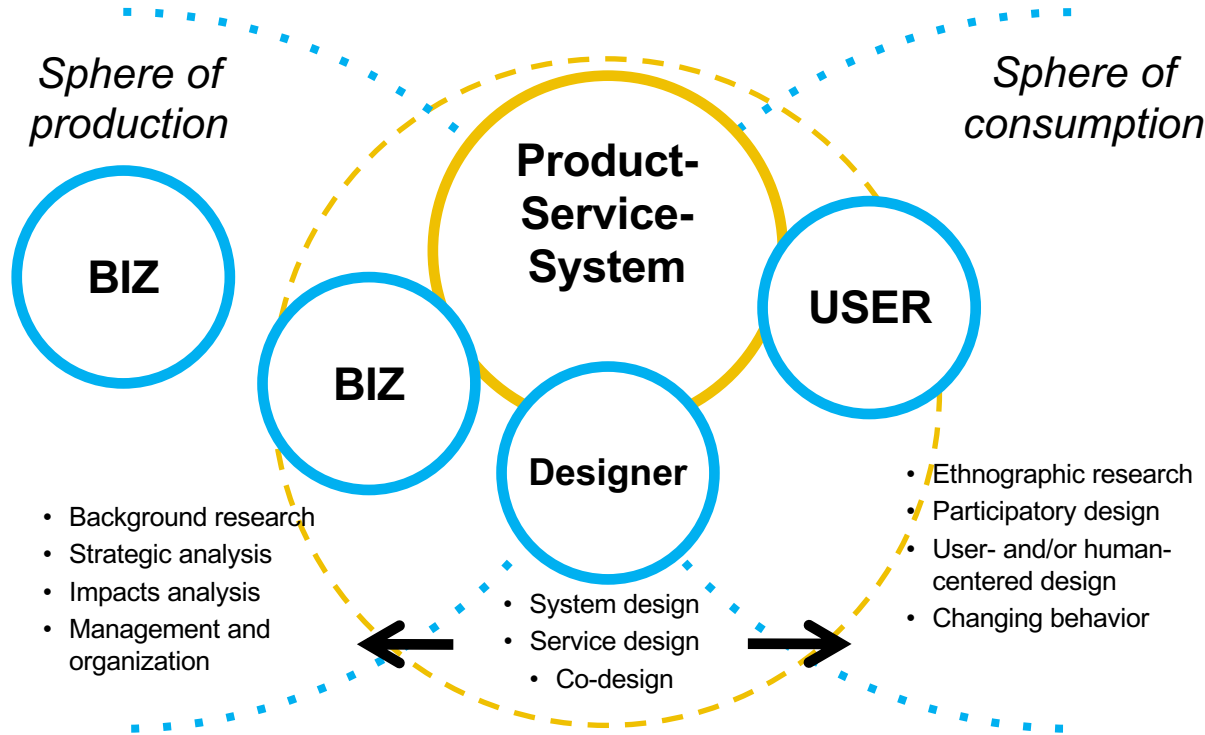
Sphere of sustainable PSS design action

Sustainable consumption and production at the interplay of stakeholders:

Product-Service-System

Consumer

Producer
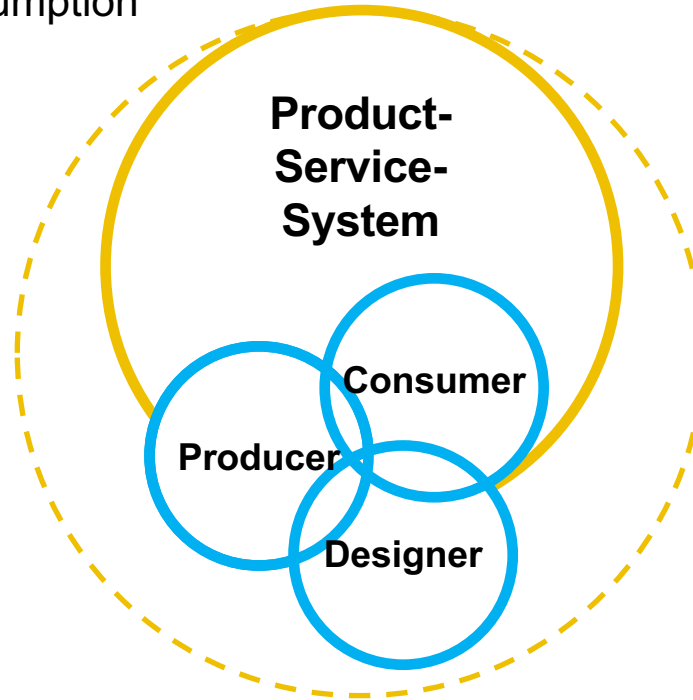
Designer

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?

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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?

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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...

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PSS design in Circular Economy

Circular Economy (CE) as an economic model

Circular Economy (CE) as an economic model builds on the understanding that the linear material flows of global production and consumption systems cannot continue on their current trajectory. Instead, **more circular material systems are to be embraced** (see e.g., Brandão, M., et al. 2019).

CE seeks changes especially in the way we use (organic and technological) raw materials in production and consumption. It connects to novel offerings and interactions in both **business-to-business (B2B)** and **business-to-consumer (B2C) service domain,** and also to support various actors the CE transition (e.g, research collaborations).

Also the EU has endorsed CE as a model in its Circular Economy Action Plan (CEAP; 2015), with emphasis on improving resource use and recycling, waste prevention, and promotion of more holistic design.

Brandão, M., et al. (2019). *Handbook of the circular economy*. Edward Elgar Publishing.
The European Commission (EC) (2015). The EU's Circular Economy Action Plan.
https://emf.thirdlight.com/link/l3i96x2za3la-8o3wq5/@/

CE and PSS design

CE entails a systemic view, and focus on various organic and technological material cycles.

PSS design for CE thus seeks possibilities for **closing the loops** on various stages of the value chain, and more efficient, circular and extended use of products and materials.


Increasingly powered by renewable energy

Mining/materials manufacturing

Biological cycles

Technical cycles

Farming/collection[1]

Parts manufacturer

Biochemical feedstock

Restoration — Biosphere

Product manufacturer

Recycle

Service provider

Refurbish/remanufacture

Biogas

Reuse/redistribute

Cascades

Maintenance

Anaerobic digestion/composting

Consumer — Collection

User — Collection

Extraction of biochemical feedstock[2]

Energy recovery

Leakage to be minimised

Landfill

Source: Ellen MacArthur Foundation (2019). *Circular economy systems diagram.* https://ellenmacarthurfoundation.org/

ELLEN MACARTHUR FOUNDATION

PSS for circular plastics

The EU promotes circular plastics for example with new packaging directives that require producers to collect and recycle plastics from packaging.

Several PSS opportunities can be identified in the circular plastics value chain, especially in B2B domain between recyclers and producers, as well as in B2C domain in relation to product-life extension, and efficient end-of-life services.
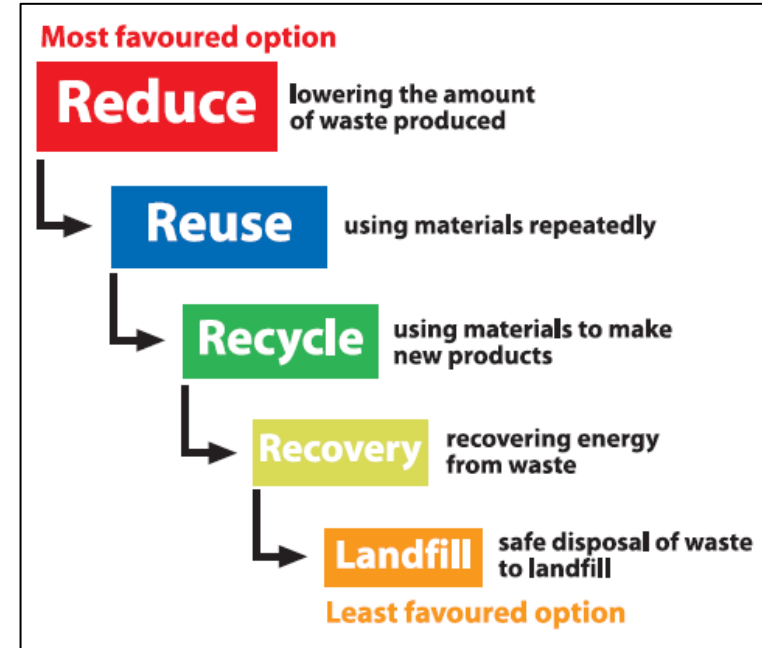
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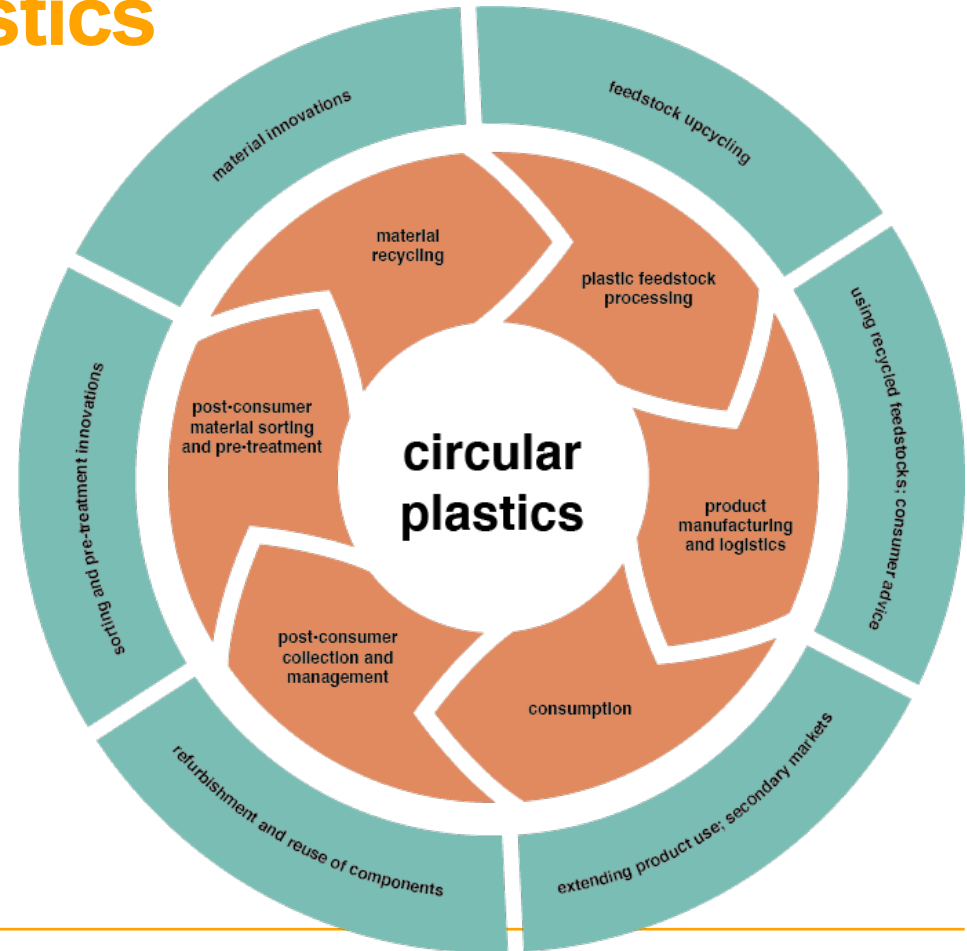
Example: Redesigning plastics by Ellen McCarthy Foundation

Our current economy employs a linear, take-make-dispose, model (resources are **taken** from the ground, **made** into products and then **thrown away**). This model has contributed to both the positive but also negative effects of plastic being everywhere.

Take → **Make** → **Use** → **Throw Away**

But what if we had an economic model that was more 'circular', and kept products and materials cycling within the system for longer? This vision for a 'circular economy' aims to optimise value by increasing the lifecycle of materials and designing out waste, thereby decoupling growth from the consumption of finite resources.

Most favoured option

Reduce lowering the amount of waste produced

Reuse using materials repeatedly

Recycle using materials to make new products

Recovery recovering energy from waste

Landfill safe disposal of waste to landfill

Least favoured option

Source: Ellen McCarthy Foundation: Redesigning plastics

PSS for food waste and bioplastics circularity

The EC Scientific Advice Mechanism (SAM) also promotes use of bioplastics in contexts where it is challenging to separate plastic from organic material (e.g., food system products).

Several PSS opportunities can again be raised along the material cycle, in B2C domain especially with recycling information, collection systems, and efficient end-of-life use, and in B2B domain in the form of improved use of waste side streams and sales of e.g., energy services

CIRCULAR ECONOMY

BIODEGRADABLE & COMPOSTABLE PRODUCTS

FOOD

FOOD-WASTE IN BIOWASTE BIN

SEPERATE COLLECTION OF BIOWASTE

MADAFFALD

BIOWASTE TREATMENT IN INDUSTRIAL COMPOST PLANT

BIO BIOGAS

BIO-GAS

COMPOST FOR PLANT-FERTILIZING

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Focus areas for PSS design in CE context

PSS design seeks systemic efficiency, and CE moves focus to efficiency in material use and circularity, empowering changes in consumption and production. **Hence, the focus areas for PSS design in CE context can be as follows:**

- **Improved management of material flows:** PSS designs can offer ideas to both B2C and B2B to enhance material-use efficiency, recycling, and/or reuse of waste and side streams.

- **Services and strategies to extend product life:** To extend product- and material-life, both B2C and B2B, as well as community PSS solutions can be developed (e.g. repair, recycle).

- **Efficient end-of-life systems:** PSS offerings can also help in developing efficient take-back systems to support recycling especially in B2C but also in B2B domain.

- **Visibility to material circularity in consumption and production:** DfS and PSS design for CE is also communicating the urgency and need to change patterns of our material use.

PSS design process, tools and methods

The process and methods for PSS design

The PSS design process conforms to the conventional design process, starting from strategic analysis and opportunity exploration to ideation and system design, and to the further iteration and prototyping of the (PSS) design concept.

Methods and tools for PSS design cover various ecodesign and service design tools, and also the facilitation of strategic co-design and prototyping:
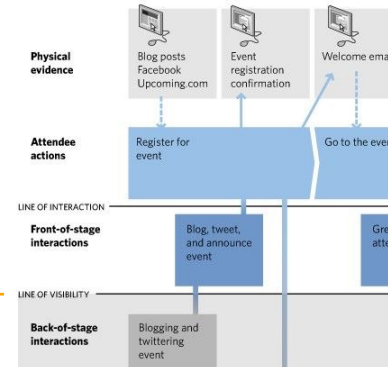
(Systemic) impact assessment
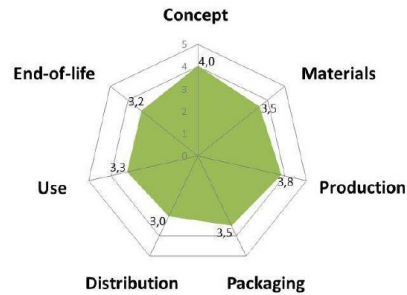
Stakeholder and system mapping
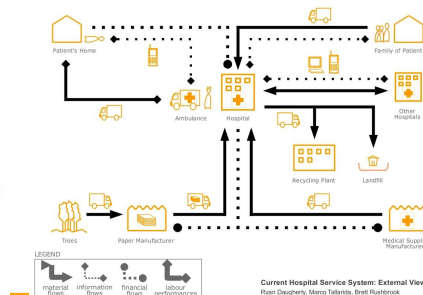
Service interaction blueprinting

Strategic co-design, collaborative prototyping

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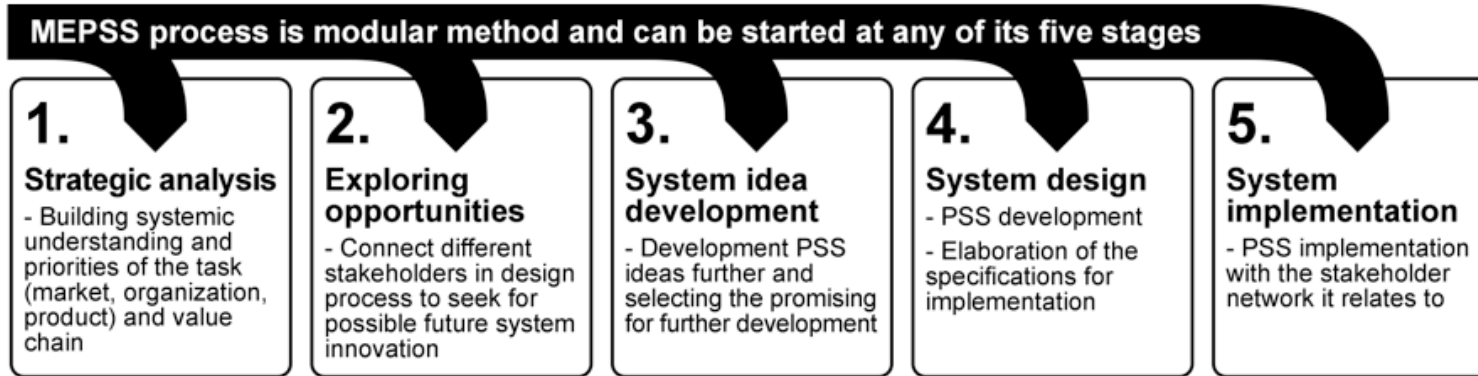
Figure 1. MEPSS design process and its five stages (based on Van Halen, C. et al. 2005; Vezzoli, C. 2007).

Designer as the match-maker

Design action can focus to:

- Redesigning system interactions and connections

- Connecting new stakeholders within the problem context

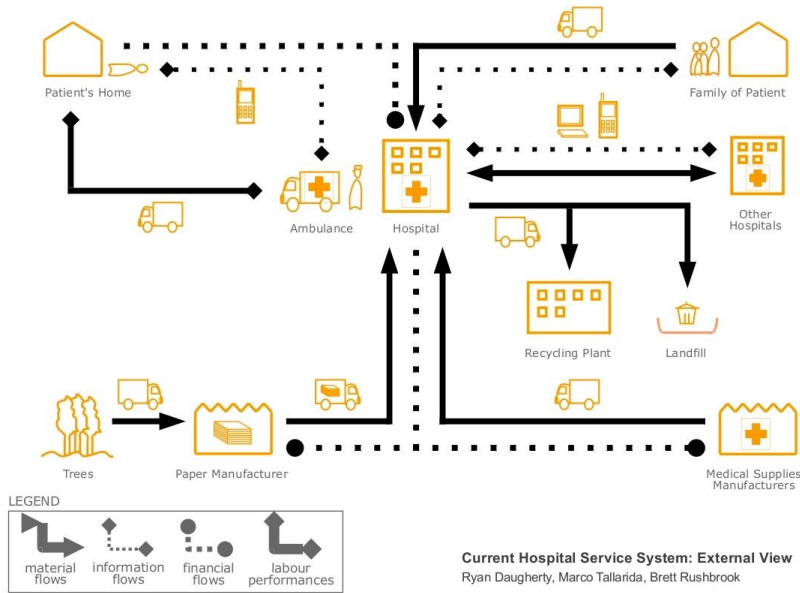- Communicating system interaction and value propositions
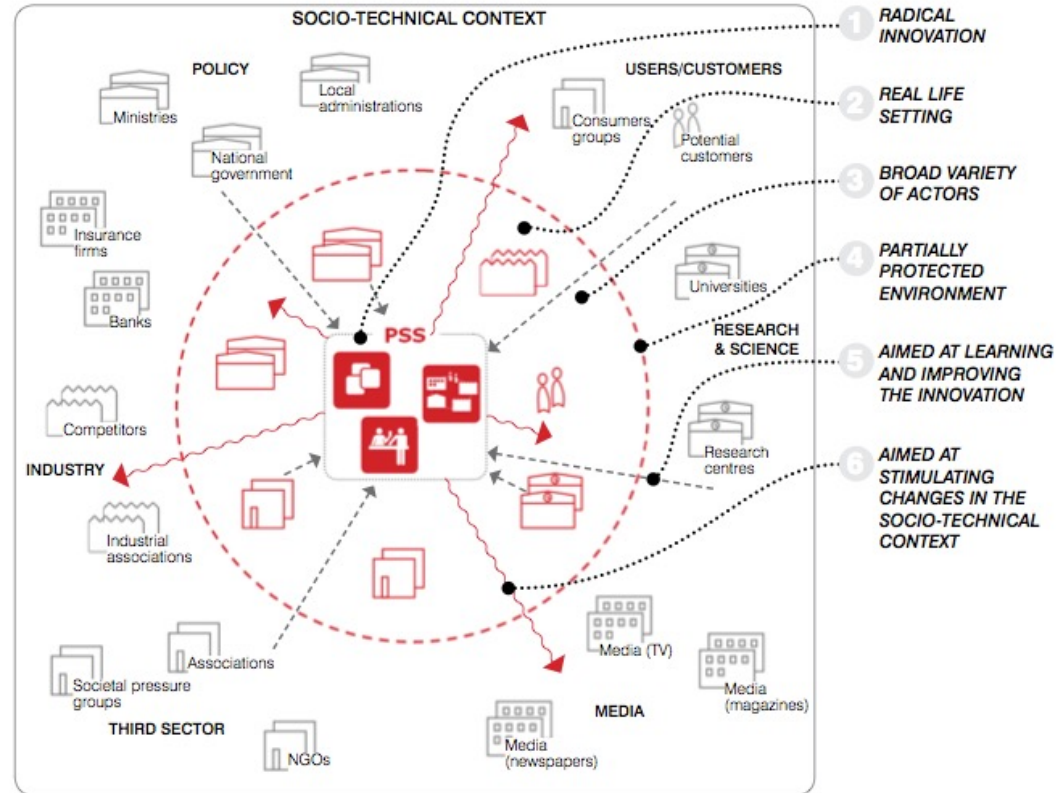
Source: Ceschin, 2013

Mapping the system with its core actors and interactions:

Socio-technical context

Product-service system

Design offering

Current Hospital Service System: External View
Ryan Daugherty, Marco Tallarida, Brett Rushbrook

LEGEND: material flows, information flows, financial flows, labour performances
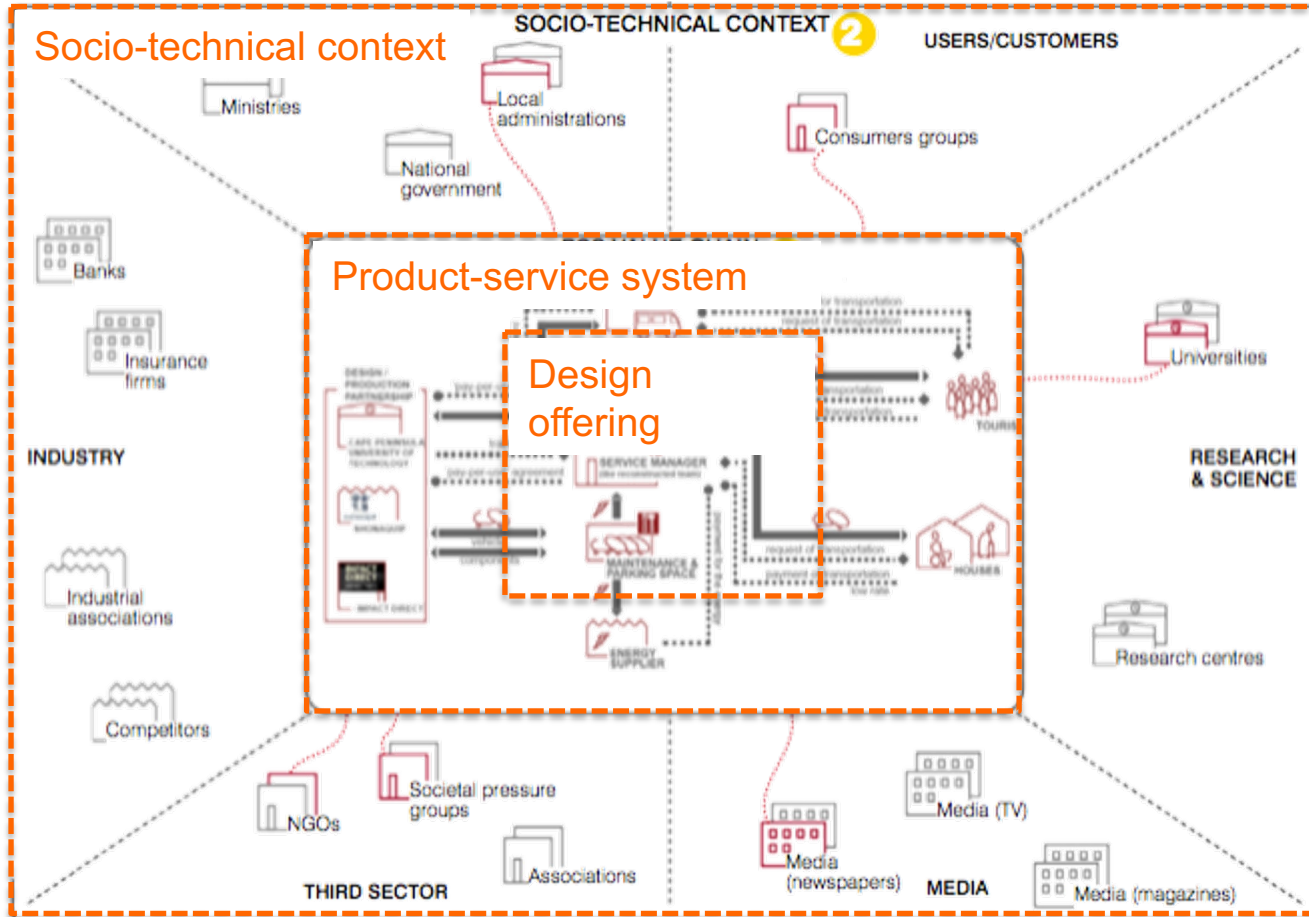
- How are interactions designed? Can they be redesigned?
- Can you introduce changes to your product system: increase sustainability through improved system or with a novel component with additional value?

- What is the core 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?

STAKEHOLDERS

PARTNERS
PRIMARY STAKEHOLDERS
SECONDARY STAKEHOLDERS
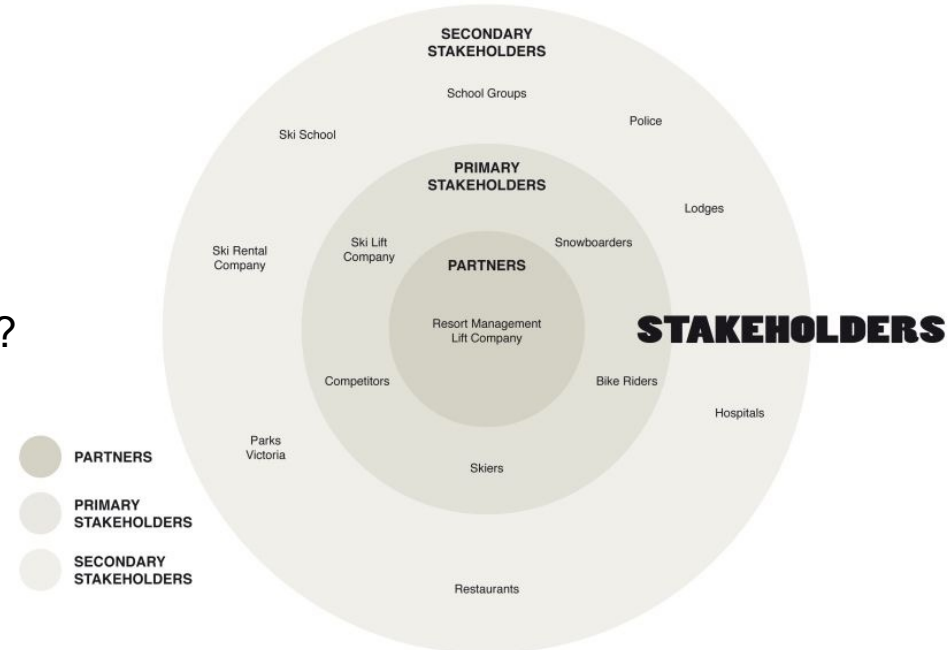
Assessing the offering from user perspective:

Part of the detailed Offering Diagram that visualises the whole offering

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

Assessment of production system and product-service offerings, and novel stakeholder & system interactions:

LCD connecting the product (-service) system stream ends.

A

Production of electricity

Labor

Production of raw materials

Production of other resources

B

Manufacturer

Labor

Logistics

Distribution

User

Main stakeholders

Secondary stakeholders

> > > System direction > > >

C

Disposal logistics

Recycling and repurposing

?
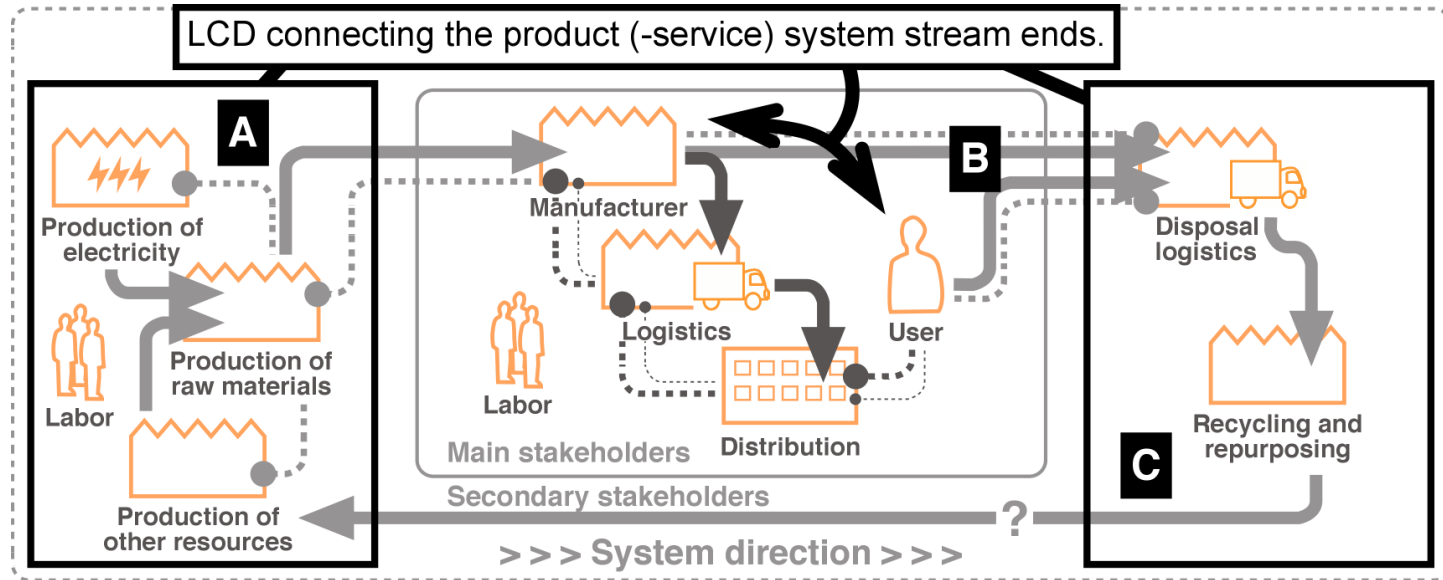
Source: Author, 2014

Identification of business value:

The Business Model Canvas

Key Partners 🔗
Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
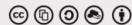Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities ✅
What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Value Propositions 🎁
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?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships ❤️
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?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Customer Segments 👥
For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Key Resources 🏭
What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Channels 🚚
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?

CHANNEL PHASES
1. Awareness
   How do we raise awareness about our company's products and services?
2. Evaluation
   How do we help customers evaluate our organization's Value Proposition?
3. Purchase
   How do we allow customers to purchase specific products and services?
4. Delivery
   How do we deliver a Value Proposition to customers?
5. After sales
   How do we provide post-purchase customer support?

Cost Structure 🏷️
What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams 💰
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 revenues?

TYPES	FIXED PRICING	DYNAMIC PRICING
Asset sale	List Price	Negotiation (bargaining)
Usage fee	Product feature dependent	Yield Management
Subscription Fees	Customer segment	Real-time-Market
Lending/Renting/Leasing	dependent	
Licensing	Volume dependent	
Brokerage fees		
Advertising		

Strategyzer
strategyzer.com

Development of 'service blueprint':

Service Blueprint for Seeing Tomorrow's Services Panel
find out more: http://upcoming.yahoo.com/event/1768041

Physical evidence	Blog posts Facebook Upcoming.com	Event registration confirmation	Welcome email	Welcome signage	Welcome pack	Displays	Twitter monitor	Takeaway
Attendee actions	Register for event		Go to the event	Arrive at the event	Sign-in	Participate with displays, discussions, and drinks	Listen and interact with panels	Depart

LINE OF INTERACTION

| **Front-of-stage interactions** | Blog, tweet, and announce event | | Greet attendees | Sign-in attendees | Seat attendees | Conduct panel | Facilitate Q&A with panel | Conclude panel |

LINE OF VISIBILITY

| **Back-of-stage interactions** | Blogging and twittering event | | Post signage and position greeter | Setup sign-in desk with volunteers, welcome packs, and attendee list | Setup room: chairs, displays, drinks and A/V | Mic panelists |

LINE OF INTERNAL INTERACTION

| **Support processes** | Create a marketing plan | Manage CMU event registration system | Recruit and coordinate volunteers | Order chairs and drinks | Coordinate panelists |

Communicating system interactions with storyboards:

SOLUTION	> database to register information	> menu formulation software	> menu formulation software	> order management system	>
		> communication system	> communication system	> appliances	
USER ROLE		>users decide which ingredients the University kitchens has to order	>users order the weekly menu		

	Service action **1**	Service action **2**	Service action **3**	Service action **4**
LINE OF INTERACTION				
		Representative of students chooses the weekly menus, basing on local producers disponibility	Students, using internet, communicate their weekly menu and the place where they will eat. The system return them a code/ticket	

| **SYSTEM ROLE** | >local producers cooperative gives information to university on products disponibility | | | >central kitchen receive orders and prepare the requested meals | > a |
| | | | | | |

Summarising topics

Some examples of sustainable PSS:
Services for mobility, food systems, and products

Car leasing service: no owner-ship or maintenance, guaranteed access with monthly fee

Food delivery service: online service with 3rd party delivery

Repair service by mail: ability to repair selected product via mail

Business offerings: sustainability (e.g., efficient energy, transport) as services

VS.

Car sharing and peer-repair service: platform for peer-sharing and repairing vehicles

Community kitchen: a place for community to gather around food

Open repair workshop: a supported workshop for repair and tool rentals

Social innovation: gather into networks to create platforms for peer-activity and sustainability

...Remember a critical perspective in considering sustainability improvements!

Summary of session topics

- **Product-Service System (PSS) design focuses** to restructure stakeholder roles and interactions to increase the systemic efficiency in delivering a 'functional offering' (i.r., access to a selected service)

- **Types of PSS** range from product oriented, to use oriented, and to result oriented solutions

- **In the CE context, PSS design emphasis** is on efficiency in material use and circularity, and in extending product life, promote sharing, and providing efficient end-of-life systems.

- **Not all PSS designs are sustainable:** sustainability transition in production and consumption calls for further restructuring of the producer and consumer roles

- **Remember a critical perspective** in considering sustainability improvements!

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Assessing the service-offerings, products, and elements of interaction with 'offering diagrams':
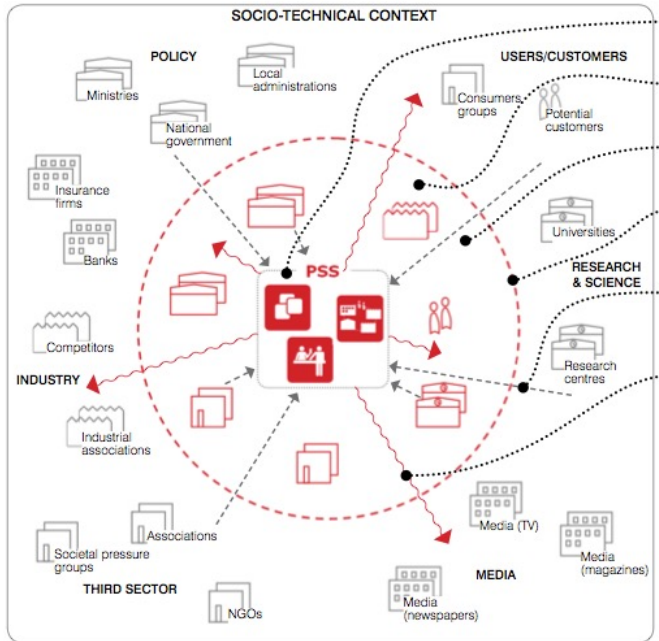

- Communication on system value and focus stakeholders
- Identification of system components, functionalities
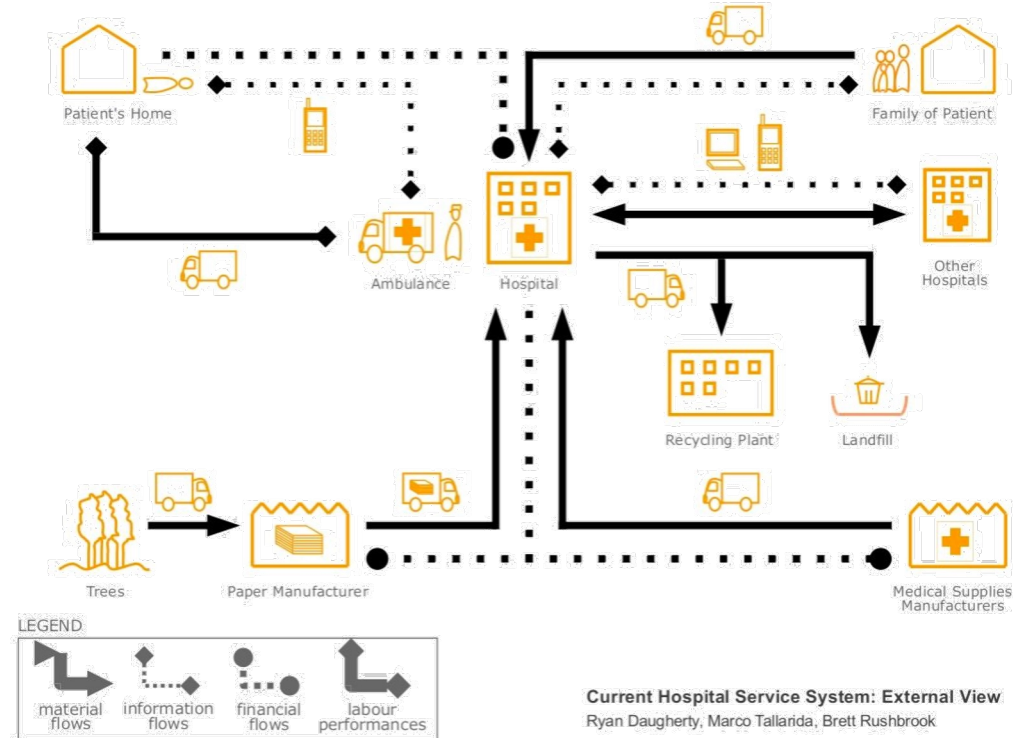- Identification of elements of PSS-offering
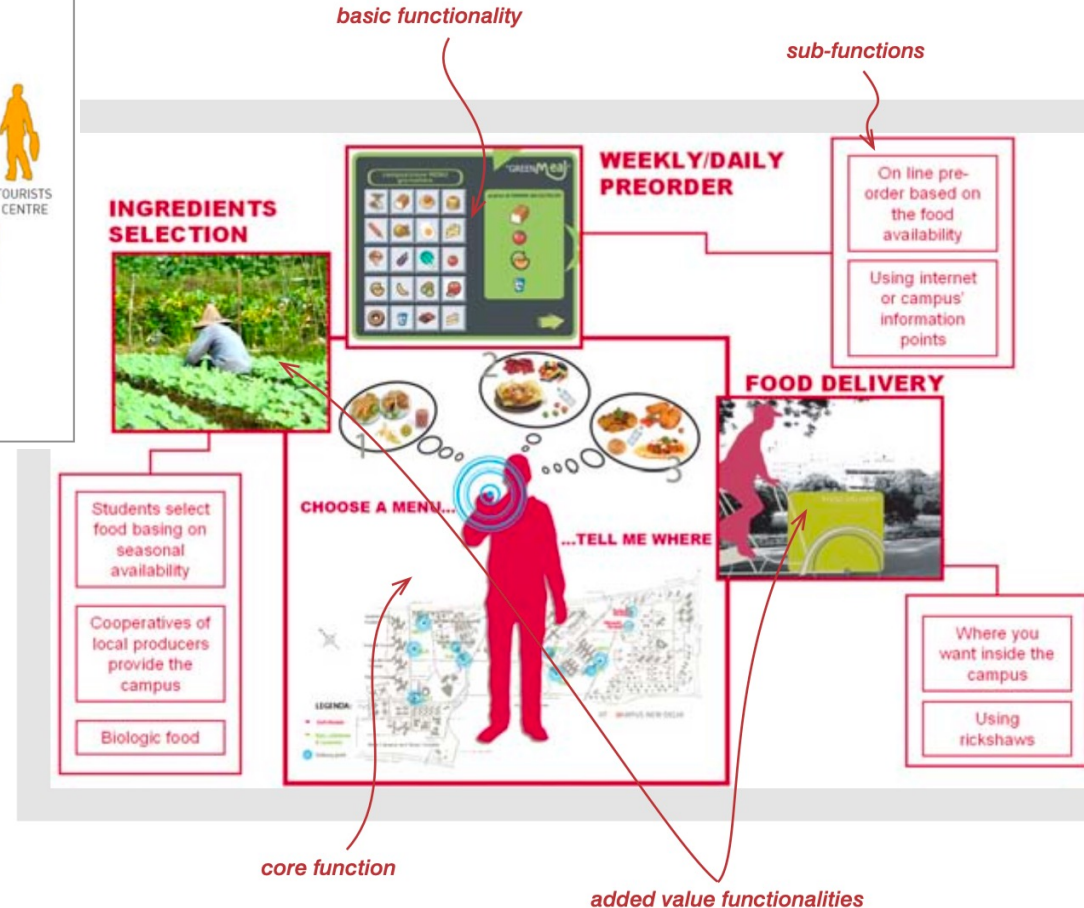
Mapping the PSS system:

- Identification of connections to broader socio-technical setting
- Identification of system elements, interactions, flows (materials, products, information etc.)

Source: Ceschin, 2013

SOCIO-TECHNICAL CONTEXT

POLICY — Ministries, Local administrations, National government

USERS/CUSTOMERS — Consumers groups, Potential customers

Insurance firms

Banks

Universities

RESEARCH & SCIENCE

PSS

Competitors

Research centres

INDUSTRY

Industrial associations

Societal pressure groups

Associations

Media (TV)

Media (magazines)

THIRD SECTOR

NGOs

MEDIA

Media (newspapers)

Patient's Home · Family of Patient · Ambulance · Hospital · Other Hospitals · Recycling Plant · Landfill · Trees · Paper Manufacturer · Medical Supplies Manufacturers

LEGEND

material flows · information flows · financial flows · labour performances

Current Hospital Service System: External View
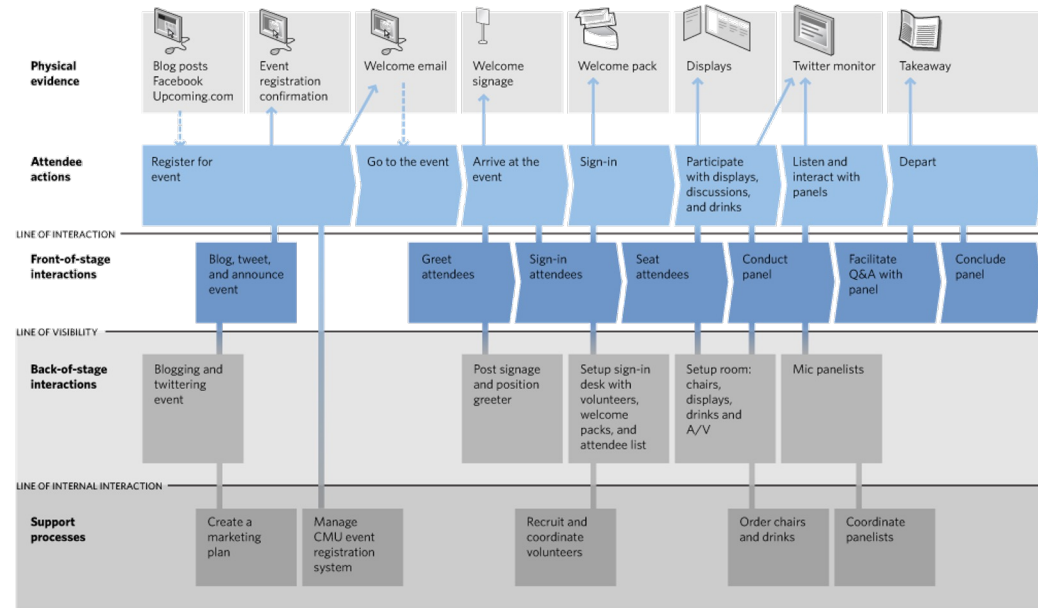Ryan Daugherty, Marco Tallarida, Brett Rushbrook

Assessing progress and refining details:

- Assessment and communication of progress and improvements
- Detailed design of PSS interactions and elements
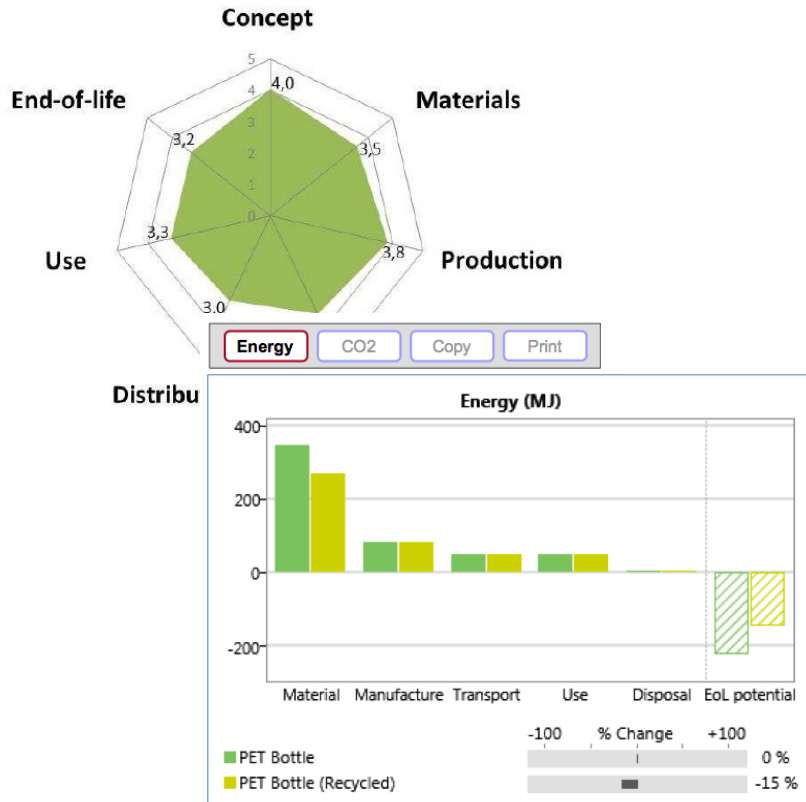
Next steps to continue work…

To continue with the topic in general, you may think of PSS-type of examples for further assessment:

➢ Consider e.g., main sectors of consumption: Food services, mobility, housing, energy, but also products (e.g., clothing, IT-products), tourism, etc.

➢ What are the possible changes to system and stakeholder network, and how that adds value?

➢ Are there changes in ownership? Who ensures product longevity and efficient end-of-life?

➢ Continue to discuss potential improvements; You can support work with system and stakeholder mapping and service blueprinting

Supplementary readings on sustainable PSS design (open access book):

Vezzoli, C., B. Garcia Parra, & C. Kohtala (2021). *Designing Sustainability for All – The Design of Sustainable Product-Service Systems Applied to Distributed Economies.* Springer.
https://link.springer.com/book/10.1007/978-3-030-66300-1

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Group activity

Activity in project work groups

Continue working in project work groups:

- **Think of your focus theme of SCP, and start to think of the system elements (and sub-systems) from the user perspective**

- Consider physical elements and material flows, but also service components and elements of communication and interaction

- If you have time, proceed to more detailed mapping of the stakeholder network and the PSS system

- What are main materials and products in the system? Who are the main stakeholders (actors) and how are the interactions designed?

- You can use a paper canvas and post-its to scetch for both offering diagram as well as the stakeholder system mapping

- **Lets gather back to class at 11:50!**

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Feedback on the exercise?

Next week sessions: Topics & readings

Tuesday (23.1.):
Socio-technical experimentation & social innovation

Lecture reading:

- Ceschin & Gaziulusoy (2020) Design for Sustainability, Chapter 9: Social innovation
- Supplementary reading (if you feel like it): Ceschin (2014) How the Design of Socio-technical Experiments Can Enable Radical Changes for Sustainability

Remember to begin to reflect on weekly topics and progress in your learning diary!

Thursday (25.1.):
Project work: Idea presentations

Session agenda:

- Groups present their initial ideas for their SCP challenge; Each groups has 15 minutes slot including feedback

  Schedule for the session:
  9:15–9:20   Welcome!
  9:20–10:35   Groups 1–5 (15 min slots)
  10:35–10:45 (break)
  10:45–12:00 Groups 6–10

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Thank you!