



Aalto University
School of Arts, Design
and Architecture

Innovative business thinking through PSS for sustainable consumption

Kirsi Niinimäki

Associate Professor in Design, Fashion Research

Fashion/Textile FUTURES Research Group



Aalto University
School of Arts, Design
and Architecture

Design-Manufacturing- Consumption

Challenges in fashion consumption

- New, creative ways of building business in the context of sustainability.
- The new value proposition for consumers through service aspect.
- Product-Service-System PSS approach; one of the key principles for new kind of sustainable value creation.
- It is hard to invite consumers towards sustainable consumption practices in the fashion field and therefore the business thinking has to be much more radical and fundamental, laying ground to sustainable consumption.

According to Manzini (1994) it is not enough to redesign existing products and make eco-efficiency improvements in manufacturing processes if aiming to reach a more sustainable future.

The focus should rather be on people's consumption behavior, and a new radicalism is needed to stimulate a drastic change in consumption patterns.

- Products configure consumer needs and use patterns; hence, design can be said to be “practice-oriented”, creating certain everyday practices and consumption behaviour

(Shove et al. 2007, 134–136).

- Current industrial design and mass-manufacturing systems stimulate consumerism and the production of disposable products

(Walker 2007, 51).

- To create a new, sustainable balance between design, manufacturing and consumption, **alternative ways** to create products and doing business are required to drive **more sustainable consumption behaviour.**



Aalto University
School of Arts, Design
and Architecture

Understanding the connection between design-production- consumption and business thinking

- Mass manufacturing of clothing in cheap Asian countries has ended up in situation where cheap product prices lead consumers to impulse purchases and unsustainable consumption behavior: overconsumption, very short use time of products and premature disposal of the product.
- Accordingly the environmental impact of this industry is every increasing and simultaneously the textile waste is more than ever filling the landfills.



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

Fashion consumption

Clothing Consumption

- Currently clothing is far cheaper compared to household incomes than a few decades ago.
- Textile and clothing prices have fallen and currently the consumer possesses more and more cheap garments and low quality textiles.



Aalto University
School of Arts, Design
and Architecture

Short use times
Not active garments



Aalto University
School of Arts, Design
and Architecture

The average piece of clothing stays in the wardrobe for 3 years and 5 months.

*The customer has worn it for 44 days during that time,
and it is worn for 2.4 to 3.1 days between washing*

Only 7.5% of laundry is heavily soiled. The majority is washed more for cultural or behavioural reasons.

(Uitdenbogerd et al. 1998
Shove 2003)

Respondents' estimation of the shortest use time of their garments

	Men	Women
Less than 1 month	10.3	21.8
1-2 months	12.1	9.2
3-6 months	25.9	30.3
7months-1 year	25.9	28.2
1-2 years	22.4	13.4
2-3 years	3.4	4.9
3-4 years	0	1.4

Niinimäki 2011

Impulse purchasing

- 24% of consumers; the latest garment purchase was impulse
- 19% of ethical consumers stated that
- 31% of consumers with lower environmental interest stated that their latest purchase was impulse

Niinimäki 2011

The importance of the ethical value base

	Hard line ethical consumers %	Consumers with low sustainable interest %
My lastest fashion purchase was impulse	19	31
My oldest garment still in use is over 5 years old	84	59
I have used some garment less than 1 month	14	22

Impulse purchasing

- A cheap garment with low quality bought on impulse; no expectation to last for a long time.
- Less consideration is used for cheap garments during purchasing.



Niinimäki 2011

Impulse purchasing

- impulse shopping had resulted in the wrong purchase decision rather often.
- Consumers noticed that the garment did not fit in a satisfying way, the colour was strange or wrong, the material felt uncomfortable in use, or that the garment did not fit into the existing wardrobe.
- These kinds of garments purchased in error may not be used at all.

Textile waste

- 17kg/person/year in Finland
- 24 kg in Sweden
- 32 kg in USA

Design with evolutionary soul

Owning Time	Use Frequency %		
	Active	Seldom	In storage
<1 year	88.9	11	0
1-3 years	78.5	14.7	6.9
4-6 years	78	18.3	3.6
7-9 years	52.8	25	22.3
10-12 years	54.9	19.6	25.5
13-15 years	56.3	12.5	31.3
16-18 years	50.1	18.8	31.3
19-21 years	33.4	38.9	27.8
22-24 years	11.1	44.4	44.4
25 years <	16.4	20.9	62.8

Use Frequency by Length of Ownership Niinimäki & Armstrong 2013

Design with evolutionary soul

	I	II	III	IV	V
Phase	Use enjoyment	Liking and loving	Reflecting	Cementing	Memento
Owning time/ years	0-6	7-18	19-21	22-24	25 years<
Use phase	Active	Active/ Seldom	All use phases	Seldom/ Storage	Storage

Attachment phases in temporal context Niinimäki & Armstrong 2013



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

New value proposition

A?

Aalto University
School of Arts, Design
and Architecture

Design?

Practice oriented

Emotional satisfaction

Values in products;

Monetary or exchange value

Use value (practical functions)

Artistic value (aesthetic quality)

Personal, sentimental value (emotional)

Environmental value

Social or cultural value

Aging aesthetically



Patrik Prusak



Aalto University
School of Arts, Design
and Architecture

Understanding the needs of users

Challenges in Sustainable Clothing Consumption

- The use time of clothing
- Create person-product attachment
- Attributes for product satisfaction, which is a possibility to extend the use time of the product
- Find alternative ways to fulfill consumers' vanity needs in appearance in a more sustainable and less materialistic way.

What is behind of fashion consumption

- Where we need fashion for
- Tempting Fast fashion
- Constant and fast changes
- Fashion consumption as a hobby
- "Shopping offers excitement, experiences and happiness"
Fashion as a hunt, emotional side of fashion consumption
- Identity building through external symbols
- Need for beauty, need for social acceptance



Aalto University
School of Arts, Design
and Architecture

Quality

Instrumental

-physical properties

Expressive

-psychological response to garment



Aalto University
School of Arts, Design
and Architecture

Symbolic values

Beauty in garment through;

-visual

-tactile

-olfactory

-kinetic experiences

Satisfaction attributes	
Quality aspects Good fit (size and cut) Durable materials Durability A) in use B) while laundering (stability in fit, material, colour) High quality in manufacturing (sewing work)	Functional aspects Suitability in use Use experience Easy maintenance
Aesthetic aspects Beauty Style Colour Fit Tactile feeling (material and fit)	Values Local production Ethicality Ecological Long life span



Aalto University
School of Arts, Design
and Architecture

Product-service systems

PROBLEM-ORIENTED THINKING

- Identification of problems leading to premature disposal (fit, fashion change, boredom, damage/wear)
 - Design PSS services to eclipse disposal (e.g. alterations, tailoring, redesign, restyling, swapping, take-back, maintenance agreements)
-

SERVICE-ORIENTED THINKING

- Identification of goods that experience long-term ownership, infrequent use
 - Design PSS services to maintain quality and satisfaction (e.g. maintenance, redesign)
-

UTILISATION-ORIENTED THINKING

- Identification of products used infrequently; status not derived from personal ownership
 - Design PSS schemes that provide utilisation of products without ownership (e.g. renting, swapping, sharing)
-

NEEDS-ORIENTED THINKING

- Identification of human need to do and interact (see *Max Neef Matrix*)
- Design PSS services to engage consumers in doing (e.g. co-design, participatory design or make-it-yourself) and social interaction (e.g. customisation, consultancy or swapping/sharing)

A?

Aalto University
School of Arts, Design
and Architecture

order on-line
www.beibamboo.com

1€
/item/week

guaranteed hygienic

home delivery

Renting children wear/Beibamboo company

- The company Beibamboo offers children's wear made of high quality and environmental friendly bamboo material (<http://www.beibamboo-shop.com>).
- It is a rental service, from where children's wear can be rented and used for as long as it fits the child.
- The clothing is then simply returned to the company by post and a new order for larger clothes placed online.
- Between each user the clothes are professionally cleaned, disinfected and treated for stains.
- Combining a renting service with eco-products maximises the environmental benefits of this approach.



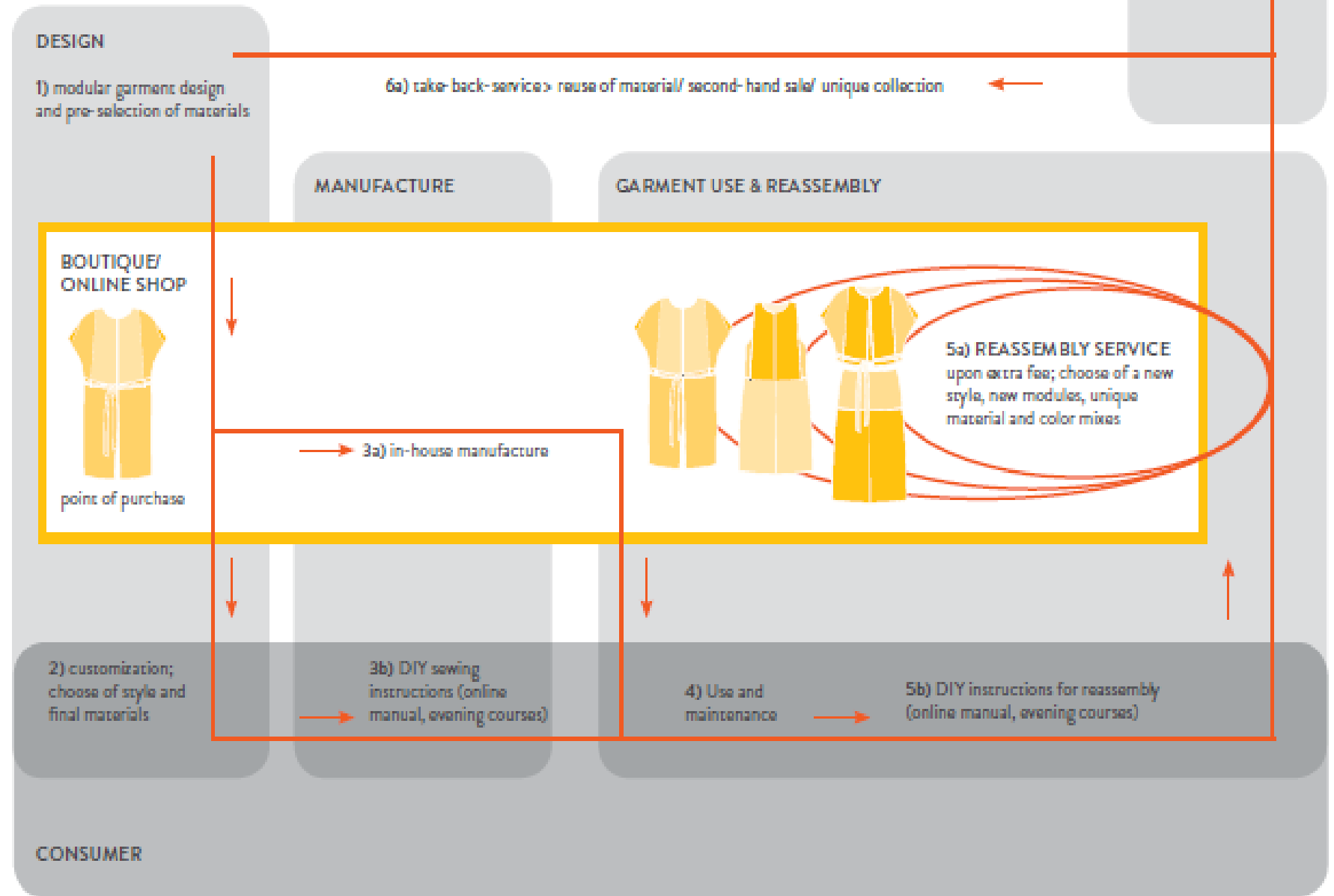


**Aalto University
School of Arts, Design
and Architecture**

Modular design

Modular structure

- A modular structure allows quick disassembly and reassembly of modules
- In terms of clothing, this would mean detachable parts (e.g. suitable for design for recycling)
- Upgrade the product or to personalize the product through modifications; e.g. some pieces of the clothing can be changed or the consumer can select the details according to his/her favorite colors or materials
- Aim is to extend the life span of clothing



System for modular fashion design (Karell, 2014)



Essi Karell 2014

In addition to four basic looks the modular garment structure enables multiple variations to be made later on.



**Essi Karell
2014**

A?

Aalto University
School of Arts, Design
and Architecture

FAST or SLOW



Design by Anna Ruuhonen: Best Top, Maitresse Dress, Morning Light Dress (Photo: Victor Matussiere)

Anna Ruuhonen

A?

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

Slow



White Label

Made-to-measure collection

Black
Classics

Permanent
Collection

Design
concept

Sustainable fashion

Iconic
collection

order online

AR by ANNA
RUOHONEN

Ready-to-wear

Anna Ruohonen Statement

- MISSION: Long lasting Design
- STRATEGY: Production on demand
- INVESTEMENT: Respecting the client
- RESULT: Intentional simplicity from uncompromising design

- Designer Anna Ruohonen creates long lasting and high quality fashion (<http://annaruohonen.com>).
- She has created a timeless collection called Black Classic, where the designs are permanent but it is possible to order them in seasonal colours.
- Garments are manufactured only according to orders and according to each consumer's individual measurements.
- This strategy helps to avoid overproduction. Moreover the good fit of the clothing helps ensure deeper garment satisfaction.



Crowdsourcing

- Production in Finland/local+ethical
- Ecomaterial
- Simple design
- Manufacturing when the order amount is full
- Manufacturing according to orders only
- No extra production





Aalto University
School of Arts, Design
and Architecture

Know your customer

- The company NOMO Jeans offers computer-assisted made-to-measure jeans by using a 3D scanner (<http://nomojeans.com>). Jeans are made individually according to each customer's measurements. The customer can also choose the cut, colour, effects and details of his/her jeans.



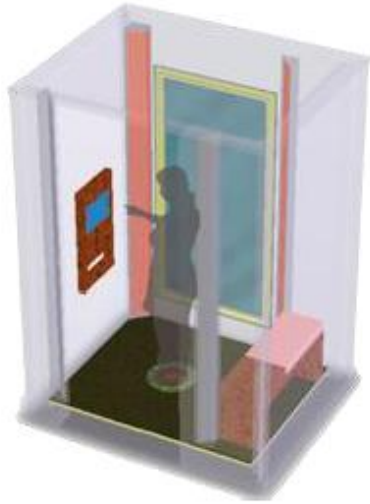


Jeans Buyers Are Not Happy:

- ▶ Regular sizes do not fit
- ▶ Trying on dozens of pairs is time-consuming and demoralizing
- ▶ Consumers want more individuality – self-branding is IN.

“I am not 31/32 Regular. I am me!”

Get Measured



A pleasant and fast experience

Choose Your Style



Designer collections for men and women

Customize



Create your ultimate personalized pair

Get Your Jeans



Get home delivery or fetch from store

The NOMO Solution

Slide
Nomo
Jeans



Key Demographics and Purchase Drivers

We have identified **three** core groups with different purchasing drivers:

- ▶ Women aged 30–60: fit-seekers
 - ▶ Men aged 30–40: individuality seekers
 - ▶ Men aged 40–60: convenience seekers
-
- ▶ Overall customer base 64% women and 36% men

"I haven't found jeans that fit me in ten years."

"You mean I can get the stitching in red? WOW!"

Slide
Nomo
Jeans

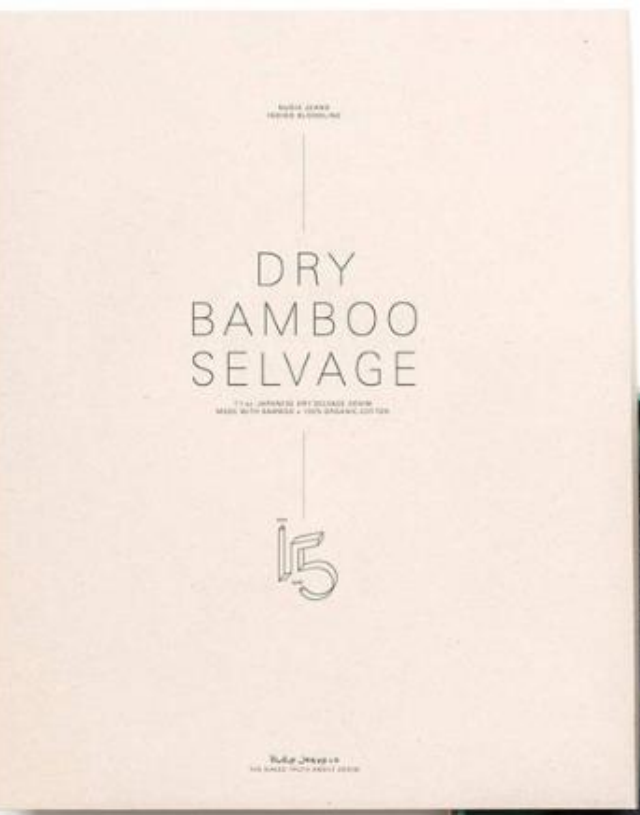


Aalto University
School of Arts, Design
and Architecture

**Services to extend the
use time**

DRY BAMBOO SELVAGE

7.1 oz. JAPANESE DRY SELVAGE DENIM
MADE WITH BAMBOO + 100% ORGANIC COTTON



- Four shades of green back pocket embroidery.
- All white selvage ID.
- 17% BAMBOO LINEN
83% ORGANIC COTTON
- Bamboo linen is made in a mechanical process. No chemicals are added. The bamboo yarn is biodegradable.



MELBOURNE	AUSTRALIA
PADDINGTON	SYDNEY, AUSTRALIA
BERLIN	GERMANY
RUMFORDSTRASSE	MÜNCHEN, GERMANY
GRANDA FRONT	OSAKA, JAPAN
LUMINE SHINJUKU	TOKYO, JAPAN
HEGDEHAUGSVEIEN	OSLO, NORWAY
BARCELONA	SPAIN
VALLGATAN	GÖTEBORG, SWEDEN
DROTTNINGGATAN	GÖTEBORG, SWEDEN
SKÅNEGATAN	STOCKHOLM, SWEDEN
JAKOBSBERGSGATAN	STOCKHOLM, SWEDEN
SOHO	LONDON, UK
SHOREDITCH	LONDON, UK
LOS ANGELES	LOS ANGELES CA, USA
BOWERY	NEW YORK NY, USA



#NUDIEJEANS



Nudie Jeans co



THE
NAKED
TRUTH
ABOUT
DENIM



OUR PRODUCT
IS MADE WITH:

100% organic cotton denim
Social responsibility
Transparent production



WE STRIVE FOR SUSTAINABLE
CONSUMPTION PATTERNS BY:

Offering free repair service
Reselling second hand products
Recycling worn out products



A HIGH
QUALITY
PRODUCT
MADE IN
A FAIR WAY

+ Finland



A?

Aalto University
School of Arts, Design
and Architecture

Fast

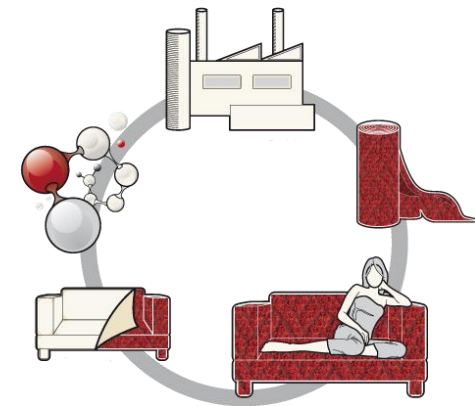
FUTURES CHALLENGES

Closed loop thinking

Circular economy

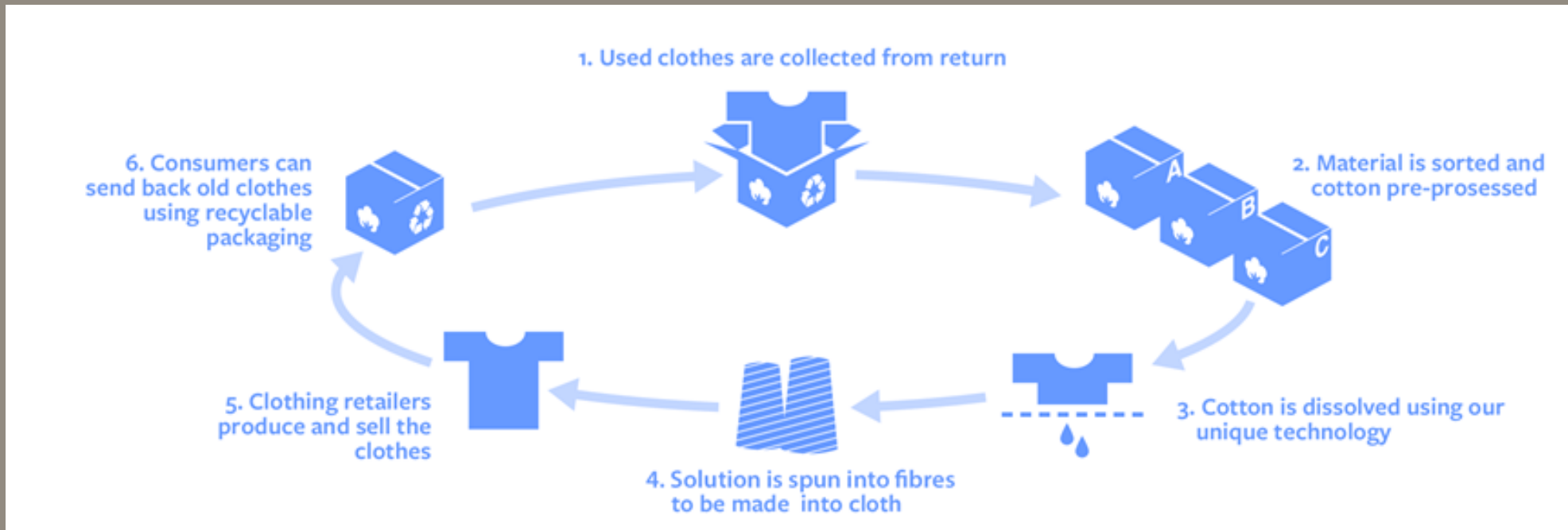
Design for recycling

- Cradle to Cradle principle (McDonough & Baungarten 2002)
- Waste and downcycling should be avoided
- Two cycles: technical or natural
- Technical, recycling for new materials
- Natural: decomposting
- New strategies for fashion design, new fashion systems





Aalto University
School of Arts, Design
and Architecture



Relooping Fashion project (Relooping Fashion, 2016)



@EUtrash2cash
www.trash2cashproject.eu

TRASH-2-CASH

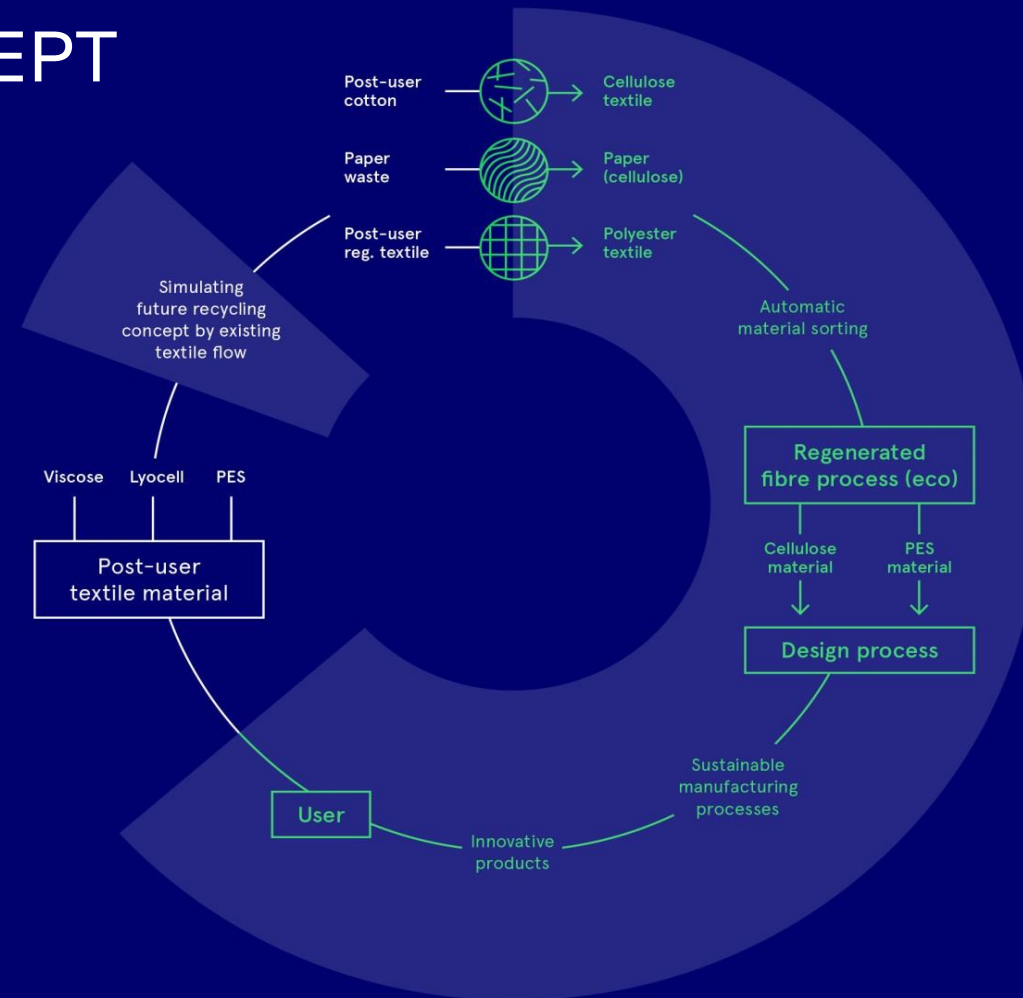
Utilising design-driven process in order to create high quality products from zero-value waste textiles and fibres



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646226

TRASH-2-CASH CONCEPT

- Creating high-end textiles from waste via ground-breaking process and material innovations
- Trash-2-Cash will turn cellulose and polyester waste fibres into new materials for high quality products through an international collaboration of design, business and technology research



Designing innovative business

- No sales-campaign, Makia; more stable style and collections
- Black Fridays, Patagonia; don't buy this jacket -campaign, Anniina Nurmi statement; x 100 prices
- No extra production, Anna Ruohonen; production according to orders only
- Extending the use time; Nudie jeans; free repair services
- Increasing trust and brand value
- System for circular material recovery



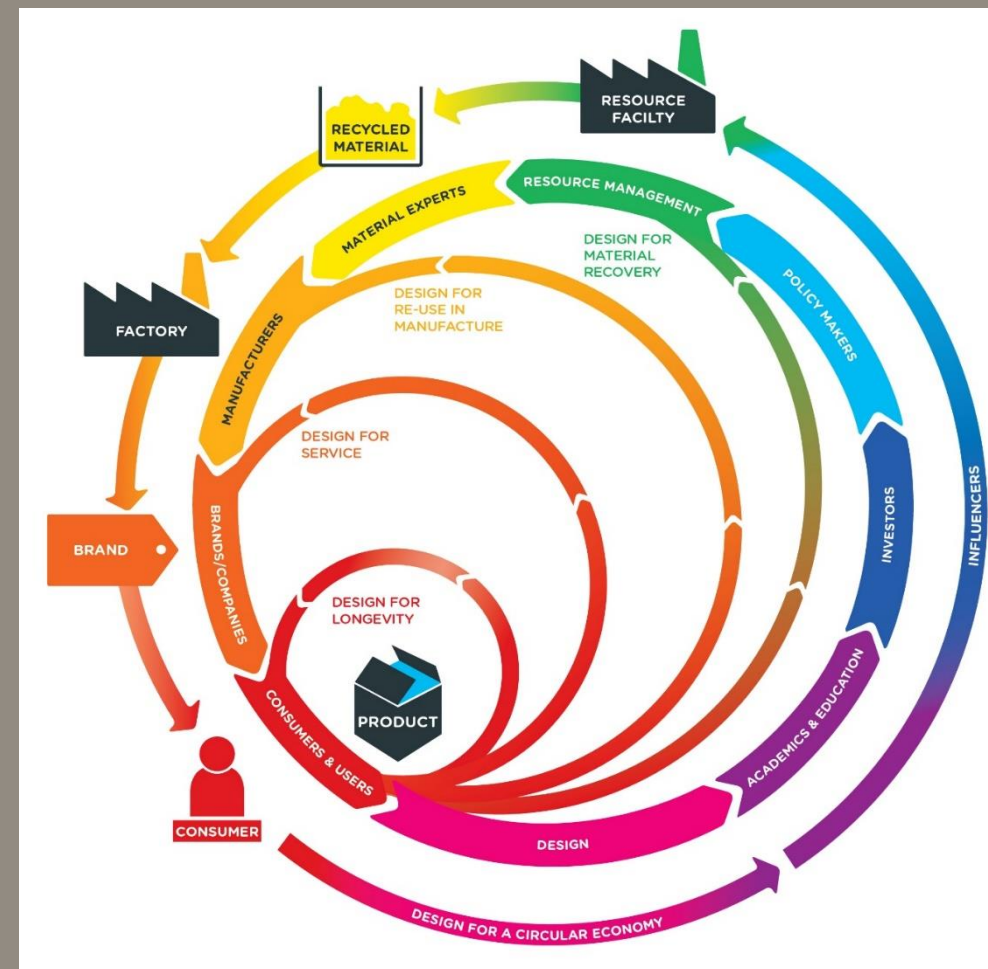
Aalto University
School of Arts, Design
and Architecture

Fashion in a Circular Economy seminar
in Helsinki
11.10

Doctoral Colloquium
Designing in a Circular Economy
12.10

More information coming soon
ftfutures.aalto.fi

Thank You
kirsi.niinimaki@aalto.fi



*The Four Models
of DCE,
Design in a circular
economy
(RSA Great Recovery)*