flatbux A service that contributes to a better co-living experience, based on principles of a circular economy.



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Take nothing for granted. Be curious.

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Introduction

Designing a possible future

The present graduation project has the objective to explore opportunities around a more sustainable and efficient way of consumption in central London. Research has been investigated by following a human centred design methodology, in the area around urban consumption, the circular economy model and fast moving consumer goods.

The shift from a linear economic model that is based on take, make and dispose, to a circular system which is build on closed loops, results in complex, system wide changes which will have far reaching implications (Ellen MacArthur Foundation, 2013).

To reach the goals which were set in Londons circular economy route map to 2036 (LWARB, 2015), change needs not only to be driven by new business models but mainly by people, who make decisions with their daily consumption of products and services.

Immersive experiences during a service design workshop in Seoul, together with the Samsung Art and Design Institute and Seoul's Upcycling Plaza; and a temporary living situation in London, have also led to a personal interest to rethink the linear, wasteful and inefficient economic model.

Processes and impacts of a circular economy are very abstract to comprehend for the end user. This project should therefore picture a future scenario that helps people to understand how the system might work for them on a daily basis. The project will question how products will be sold, used and re-used for a more efficient way of using resources and also how the user behaviour towards a more conscious consumption can be improved in the future.

Initial research focused on the user group of Millennials and people with low incomes. Discount shops in London like Argos, Flying Tiger, Poundland and other pound shops have been taken into account for first observations. The research field was explored together with users in a playful way to gain insights about their drivers and barriers around consumption behaviour and relationships to products. Further in-depth interviews with users and experts but also early adopters of new technologies were conducted to understand the motivations and needs of consumers.

Together with designers and future users, a co-design workshop has explored several future scenarios of how the relationship between retailer and user might change in the system of a circular economy and how the shift might lead to social, economical and environmental benefits.

The open and non-linear research process has allowed to shift between different interlinked fields, which leads to a service design concept, that creates a bold vision for a possible future.

Background & Context

- 1.1 Circular Economy
- 1.2 Urban Consumption
- 1.3 Sharing Cities
- 1.4 The Liquid Lives of Millennials
- 1.5 Field of Study & Opportunities

1.1 Circular Economy

Our economy is based on the linear patterns of take, make and dispose which is wasteful and inefficient. The shift to a circular model might help to overcome global challenges.

How can we move away from disposable lifestyles?

We have moved to a society that considers almost all consumer goods as disposable. The thesis of a 'throwaway society' (Trentmann, 2016) can be traced back to the 1960s when it became fashionable to change even long-lasting products like cars, every few years (Papanek, 1985).

The linear consumption model of take, make and dispose with the increasing pace of product turnovers is not only unsustainable but also inefficient. We fill our oceans with waste and at the same time we will soon run out of natural resources (Ellen MacArthur Foundation, 2013). It is estimated that we will consume three times more resources annually in 2050 (Sharan Burrow, 2017) and by 2025, waste production will be doubled (Hoornweg and Bhada-Tata, 2012).

"In western economies, 3/4 of everything we buy becomes waste within just one year."

Sharan Burrow (2017) at a panel discussion of the World Economic Forum in New York

When we talk about "pollution through products" (Papanek, 1985) it includes not only that natural resources are destroyed but also the holistic cycle of the supply chain has to be considered. It includes manufacturing processes, packaging, shipping, usage and finally the disposal and recycling (Papanek, 1985).

To tackle these global challenges, Michael Braungart and William McDonough (2009), authors of the book Cradle-to-Cradle pointed out, that we need to move away from a linear and wasteful economy to a circular model, where products and materials float in closed loops. New scenarios of product use and reuse (Braungart, McDonough, 2009) are needed to reach those regenerative systems.





Linear Economy

The linear economy model is based on the three main actions of take, make and dispose. The supply chain of value creation includes Business & Design, Manufacturer & Supplier, Retailer and User (Grüner Hering, 2017). At the time of purchase, the value of physical products is often at its highest level. After that, products only lose value over time until they get disposed.

Circular Economy

The circular economy model can be distinguished between technical and biological cycles (Ellen MacArthur Foundation, 2013). The present project will focus on the technical cycle, which deals with value preservation opportunities such as 'Reuse' and 'Repair, Remanufacture & Recycle' of products and materials. Systems like 'Products-as-a-Service' can be implemented to keep loops as small as possible and the system more profitable and resource efficient (Stahel, 2012).



12 Background & Context



Average life cycle of products



"More than 20% of all CO₂-emissions stem from durable consumer goods. Most of these goods are only used during less than 10% of their life-time."

1. 2017 UK Automotive Sustainability Report (SMMT, 2016)

2. Universiteit Gent, Life Cycle Assessment Group LCA 2 (Ayoub and Irusta, 2014)

3. thelightbulb.co.uk (Walker, 2017)

4. Self experiement at Pret-A-Manger



Designing around people's needs – not products

Beside repairing, remanufacturing and recycling, change will happen when the lifetime of products increases to reduce the manufacturing of new products (CEC Expert, 2016).

The needed reduction of consumption of a circular economy stands in contrast to how the linear economy works (Nguyen, Stuchtey and Zils, 2014). The current economic model is based on growth, where profit sits on single units. It follows the paradigm of sell more, earn more which needs the assumption of disposability. To increase sales, a rapid turnover of products is needed, which is often achieved by strategies like planned obsolescence in different kind of industries (Hadhazy, 2016). Longer lasting products and the reduction of consumption would mean a decrease in growth and therefore an unprofitable business.

A new mindset will be needed to overcome these unacceptable wasteful and inefficient practices. In a circular economy, it will be not anymore about the quantity of products that will be sold, but about products that last as long as possible (Business Debate, 2016). Not only products have to be optimized for multiple cycles of reuse and remanufacturing (Braungart, McDonough, 2009) but also business models have to be redesigned.

Seeing products as a part of a system ('products-as-a-service') and focusing on system solutions will be the most profitable and resource efficient way for a circular economy business model (Stahel, 2012). A so called "Performance Economy" (Stahel, 2010) is based on the three parameters of "producing performance, selling performance and maintaining performance over time" (Stahel, 2012). It is build on small reverse cycles, where manufacturers of products will keep ownership of goods and resources. These small cycles compared with a longer lifetime of products (a longer circulation) will be crucial in terms of efficiency along the supply chain (Ellen MacArthur Foundation, 2013).

The shift will not only change how businesses operate but also how people consume. It will be a "front-end design and innovation issue" (Sherwin, 2013) where products have not to be seen as isolated objects but as part of a system. Joe Murphy (2017) who manages the Circular Economy 100 business network at the Ellen MacArthur Foundation says in an interview, that systems have to be designed around people to be more effective in the way they operate.

For the shift to a circular economy, it is needed to consider changing lifestyles of people which are characterized by growing levels of consumption and a 'throwaway'mindset (Trentmann, 2016). New models and systems have to be not only 'less bad' but 'better' (Braungart, McDonough, 2009) to find answers for changing user needs and values.

1.3 Urban Consumption

Scarcity was for a long time the driver behind economic models. In a future, where business models are build around cycles, growth can not be the primary objective.

Abundance: Have we reached peak stuff?

The rise of consumption in the West started in the 1820s when shopping became a leisure activity, driven by the industrialization and era of the 'living-room suite' (Trentmann, 2016). Now it has become central to our economy and formes our identities.

A remnant from the industrial revolution, the linear economy mindset is mainly driven by overcoming scarcity (Stahel, 2012). Already in the 1980, an abundance of household goods in France could be recognized (Stahel, 2012). Today, most of the western society lives in abundance, using more energy and physical resources monthly, than previous generations during their whole lifetime (Thackara, 2015).

"If we look on a global basis, in the west we have probably hit peak stuff. We talk about peak oil. I'd say we've hit peak red meat, peak sugar, peak stuff ... peak home furnishings,"

Steve Howard, Sustainability Director, IKEA, 2016 at a 'The Guardian' debate (Farrell, 2016)

Clear is, that 'business-as-usual' will not lead to a sustainable future, when it is primarily based on growth. John Thackara (2016), author of 'How To Thrive In The Next Economy', used an example of a furnishing company in Sweden, which is "(...) the third largest user of wood in the world,": As long as their business model is based on growth, "the net negative impact of their firm's activities on the world's living systems will be greater in the years ahead than it is today."

For designing sustainable products and services, the team of the Fab City (2017) Global Initiative states, that a systematic deployment will be required not only to economic factors but also social, cultural and environmental aspects have to be taken into account.

Background & Context

1.3 Sharing Cities

In the last years, a main goal for cities has been to become smart, to overcome global challenges and make our lives better — but what does smart really mean?

What is a smart city?

Cities "(...) are the places where most consumption takes place." (Agyeman, McLaren, 2017). This can be traced back to the 16th and 17th century, when cities like Paris, Madrid and London can be identified as 'consuming cities' (Trentmann, 2016) and becoming meeting places of exchange.

In the last years, a main goal for cities has been to become smart to overcome global challenges and make our lives better (World Economic Forum, 2016) – but what does smart really mean?

Environmental challenges, shortage of natural resources and a growing & aging population means for cities that they have to change and adapt to tackle these challenges in the future (Arup, 2011).

It will be important to understand the genesis and why people move to a city. Chirine Etezadzadeh (2015), author of the book "Smart City-Future City?" states, that the intentions of people are different but "(...) they have one element in common: access. Access to jobs, a livelihood (...) access to the necessities of life, (...) access to infrastructures (...)" and so on.

This environment will be facing several challenges in the next years. Today, more than 54% of world's population lives in urban areas and it is projected, that it will increase to 66% in 2050. This means, that in 2050, 64% more people than today are projected to live in urban areas (United Nations, 2014).

Duncan McLaren and Julian Agyeman (2017), authors of the book 'Sharing Cities', stated that cities will be the places where "the worlds greatest environmental challenges will be solved". They support the thesis, that smart cities must also become sharing cities.

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City

In 2050, 64% more people than today are projected to live in urban areas.

United Nations (2014) World Urbanization Prospects

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World Urbanisation Trend

United Nations (2014) World Urbanization Prospects



Beside taking environmental and economic factors into account, and recognizing that solid waste is mainly a by-product of urban living (Hoornweg, Bhada-Tata and Kennedy, 2013), social and cultural aspects will be even more important to carry out needed behaviour changes of consumers, that will enable the shift to a 'smarter' city.

Today, related to, inter alia, the increasing population in cities, residents facing more and more challenges like unaffordable housing, gentrification and social inequality, to name a few (NLC, 2014).

Duncan McLaren and Julian Agyeman (2017) mention, that it will be important for the design of 'sharing systems' to think about equity, justice, trust and collaboration.

The rise of mediated forms of sharing can be recognized by bike or car sharing services, which are centralised models, lead by organisations and enabled by the use of new technologies (Agyeman, McLaren, 2017).

These models see the city as a system and make use of existing networks to tackle not only environmental challenges but also find answeres to changing lifestyles and vlaues of people. As mentioned in the first chapter, these 'access-over-ownership' (Rifkin, 2000) or 'product-as-aservice' models can contribute to the shift to a circular economy.

To make cities smart, in the sense of a circular economy, "The Danish environment minister Ida Auken suggests: 'Everything needs to be redesigned,'" (Agyeman, McLaren, 2017). New forms of business models have to be implemented to change the relationship between customer and retailer (brand/company) and contribute to a sharing city.

Global challenges seem overwhelming regarding its complexity. Considering cities as a system, acting on a local scale seems the best way to start. Thackara (2015) is optimistic that every little effort in our "(...) age of networks," can lead to system wide changes.

The Liquid Lives of Millennials

Living in a fast-moving, post-modern world causes the need for more flexibility which allows rapid turnovers, driven by desires.

A need for more flexibility

Economic and environmental factors can be seen as driving forces for the shift to a circular economy but they have to be also seen as reactions to underlying social and cultural changes.

Consumption has influenced the way how we live. "Products and people travel greater distances than ever before in human history." (Trentmann, 2016).

We live in a world, full of opportunities where 'needs' have shifted to 'desires' (Bauman, 2000). "In such world, little is predetermined, even less irrevocable.", argues Zygmunt Bauman (2000), sociologist and philosopher and author of the book 'Liquid Modernity'. One of the factors which has enabled this shift, is the overcoming of scarcity and reaching a point of abundance, as discussed in previous chapters.

"The devaluation of immortality cannot but augur a cultural upheaval, arguably the most decisive turning point in human cultural history."

Zygmunt Bauman (2000) in 'Liquid Modernity'

In a world with possibilities of rapid turnovers in almost any kind of life situation, a desire for flexibility can be recognized. Bauman (2000) stated, that "The 'short term' has replaced the 'long term' and made of instantaneity its ultimate ideal." He mentioned, that when we replace the 'durable' with the 'transient', it means that it will be "(...) used up - consumed - and (...) disappear in the process of their consumption."

When we set this shift in context with the previous findings, it can be recognised, that the model of a linear economy struggles with this 'short term' mentality because of its 'durable' outcome.

To truly find long-term and sustainable answers for desired 'transience', we need to shift to an economic model which is build on cycles and loops, that allows rapid turnovers and enables needed flexibility.



Field of Study & Opportunities

The shift to a circular economy can be overwhelming due to complex system wide changes. Following parameters were set, which helped to definine the field of study.

Scope

The shift to a circular economy causes many challenges and opportunities in different kind of fields. During the Great Recovery project, the Action and Research Centre at the RSA (2013) developed 'Four Design Models' for the circular economy.

Due to a limited scope of the graduation project, the present project focuses only on the first and second model, which concern the relationship between consumer and retailer (brand/companies) in terms of new business models, lifecycle of products, end-of-life strategy, consumer behaviour and attitudes (RSA, 2013). Interlinked topics were taken into account but not discussed in depth.



Source: RSA (2013)

Fast Moving Consumer Goods

Research was conducted around the sector of Fast Moving Consumer Goods (FMCGs), which is "responsible for the vast majority (75%) of municipal solid waste" in the US (Ellen MacArthur Foundation, 2013).

By definition, FMCGs can be found in categories like food and beverages or personal care – but also household and apparel (Statista, 2017). During the present project, FMCGs were defined as products with characteristics of quick sales, low-prices and short life cycles. The intention was, to divide products not into categories but instead into the characteristics of their consumption.

Already in the 1960, the turnover rates of products even for long-lasting objects like cars has risen because it became fashionable to dump the 'old' for new styles (Packard, 1960).

With the increasing pace of consumption of almost every kind of products, there is a big opportunity to re-think the linear and wasteful model.

Main characteristics Image: Consumption Main characteristics Eff Eff Low-Price Image: Consumption

User Group

The research of the present project takes place in London, where two user groups were identified as frequent consumers of fast moving consumer goods.

Millennials build the first group, who temporary live in London like students, 'digital nomads' and professionals. Needs and requirements in terms of temporary living, low budget and short usage of products influences their relationship to products and their life times.

People with a low-income were identified as a second user group. Constraints around low budgets and a frequent consumption characterise their behaviour and needs.

The characteristics of these two user groups have overlaps in sectors of a low budget and their uncertainty about the future, which have influence on the way of consumption.

Opportunities

The interface between consumer and retailer (brand/company) might be important for the shift to a circular economy because retailers are the main touchpoints for people getting access to products in an urban environment; and they also influence the way of how people are able to consume.

Discount shops in London like Poundland, Argos and Flying Tiger Copenhagen were in the focus of the present research where an 'extreme' consumption behaviour of the user group towards FMCGs can be encountered.

The project will question how products will be sold, used and re-used for a more efficient way of using resources and also how the user behaviour towards a more conscious consumption can be improved in the future.





Consumption behaviour



Stakeholder Map

The project focuses on the primary stakeholder groups of consumers and retailers (brand/company), who were identified as key players in the consumption process.

During the project, secondary stakeholders, who have only an indirect influence on the customer today, were identified as important players for the supply process in a circular economy model and were later on added to a relationship map.



Case Studies

Following case studies will give an overview about companies, who implemented principles of a circular economy and also projects, which picture how the shift might work for users in the future.









VIGGA is a danish company which tackles the problem of the fast outgrown of children's clothing. They ask themselves the question "What if clothes could grow with your child?" and started providing a service that allows parents to lease maternity and children's wear, which will saves time, money and resources. (vigga.us, 2017)

Precious Plastic

Local recycling of already existing materials and turning it into something new is the aim of Precious Plastic. A set of machines including a plastic shredder and a rotation moulder, can be used to turn waste plastic into raw materials like filament for 3D printers or completely new products. This could create an ecosystem of closed loop production in local environments. (Precious Plastic, 2017)

ReGen Villages, EFFEKT

The danish architect studio EFFEKT designed a concept of off-grid and regenerative housing. Its village structure uses a holistic approach to turn outputs of one system into inputs of another. With innovative technologies like renewable energy, organic food production and waste-to-resource systems, the model tries to tackle upcoming global challenges. (EFFEKT, 2016)

RePack



RePack is a returnable and reusable packaging service, that offers a sustainable way of delivery. During online shopping, people can select RePack as a delivery option. After they have received their packages, they can drop the RePack into a post box, which will go back to the retailer. This saves packaging material and reduces CO2 emissions by 80%. (RePack, 2017)









Use Me/Lose Me, IDEO

The speculative design is an answer to the question "What if your sandwich maker sold itself if you didn't use it?" A sensor is attached to electronic appliances which sends its owner a text message of the latest resell price, when it is not being used enough. If the user agrees, the service can sell the item automatically to an interested buyer. (IDEO, 2016)

Twenty, Mirjam de Bruijn

This project questions the way cleaning products for the household are sold. Its aim is to "reduce plastic waste and CO2 emissions from transport by removing the water that makes up 80% of the cleaning products' ingredients." (Sheth, 2017) Twenty will sell only the ingredients and reusable plastic bottles, in which users can add the water at home.

Amazin Apartment, Future Facility

Designer Sam Hecht and Kim Colin from the design studio Future Facility created for the Design Museum's NEW OLD show a service that helps tenants to manage and maintain their household appliances. When people age, everyday tasks can become difficult. This speculative design helps to picture how a service could create more convenience and assistance in the household. (Burgoyne, 2017)

H&M Conscious Garment Collecting Box In 2013, the fashion brand H&M launched their garment collecting initiative. It is a take back service for old, unwanted clothes in all their stores worldwide. Since they have launched the initiative, 40,000 tonnes of garments have gathered for reusing and recycling. (H&M Group, 2013)

Design Methodology

The present project used an user-centred design approach with participatory design methods and tools to gain insights about user behaviours towards their daily consumption.

The primary research used methods and tools form the ethnographic field like observations, shadowing and interviews, to learn how user behave in different everyday situations. Co-discovery activities were planned to explore the research field together with users in a playful way, to gain insights about their relationship to consumer goods.

A co-creation workshop with designers und future users was conducted for ideating, to create future scenarios of urban consumption and circular economy systems.

Tools from the service design field like personas and different mapping techniques about stakeholder, affinities, user journeys and relationships helped to synthesise findings along the process.



Design Process

The design process is oriented at the Double Diamond model from the Design Council (2005) and was divided into five major phases: Discover I, Discover II, Define, Develop, Deliver. Each phase was build on insights from previous activities, which created an interlinked design process.

For each stage, participatory design activities with users were included to uncover hidden insights about drivers, barriers, needs and values. Those activities were useful to gain insights on a playful way about the everyday lives of people and learn about individual behaviours and relationships.



Secondary Research: Trends & Case Studies

š∰ = key moment

Discover

- 2.1 Observations
- 2.2 Co-Discovery
- 2.3 Interviews

2.1 Observations

Field Research

The field research started with methods and tools from ethnographic practices. Observations in four different fields were conducted to explore and discover new perspectives. Insights of users everyday experiences were gained in different fields around urban consumption, material recycling, adoption of new technologies and future trends.

The initial field research started with observations to immerse into everyday life experiences of people, discover new perspectives and explore different practices around urban consumpition.



`End of Life'

First observations around recycling and remanufacturing were conducted at Seoul's Resource Centre (SR) and Upcycling Plaza (SUP). Around London, the Islington Reuse and Recycling Centre and several waste containers were observed.



Discount Shops

Discount shops were identified as main touchpoint of the user group for the consumption of daily household products. Observations and interviews were conducted around stores like Flying Tiger Copenhagen, Argos, Muji, Poundland and other pound shops.



Early Adopters

The Machines Room and Library of Things were identified as early adopters of new technologies and services. The places were visited to learn from their daily practices and past experiences.



Talks & Conferences

New perspectives and opportunities were discovered during different talks and conferences like the London Design Festival 2017 and a SPACE 10 pop-up.



Seoul Resource Centre

During a one-week service design sprint together with the Samsung Art and Design Institute (sadi), a resource centre in Seoul was visited. The facility was set up to recycle old appliances and contribute to the cities zero waste strategy 2030. (OpenGov Seoul, 2017)

The observations lead to the findings, that products which were collected there, seemed mostly to be tossed electronic appliances that were not older than 10 years. Related to their complexity in production and material combination, it can be said, that the products are not designed for remanufacturing. The recycling process is long and the working conditions are hard. It seems that the process can not be automated because of the diversity of the products which all need individual processes. It also seems, that there is no best practice inplace for the disassembling process in place, which means that each worker has to define their own way.

To reach the goal of a circular economy, products have to be designed with disassembling in mind, to create an efficient reverse cycle for remanufacturing and recycling old products. (Ellen MacArthur Foundation, 2013) Waste sorting process at Seoul Resource Centre (SR), South Korea





Local Retailers

The research in London started with observations at local retail stores to gain insights into the relationship between consumer and retailer but also the consumption behaviour of people.

The focus was laid on discount stores like Flying Tiger Copenhagen, Poundland or Argos where an 'extreme' consumption behaviour were encountered; traced back to cheap prices and rapid turnovers. Related to these characteristics, almost all goods which were sold by these discount stores can be seen as fast moving consumer goods, by following the characteristics of quick sales, low prices and short lifespans.

The stores were popular by Millennials and people with a low-income mostly because of the cheap prices. They bought products with disposability in mind, because they were needed only for a temporary time.

The stores were identified as a main touchpoint of consumption in London and were seen as one common way of how people are able to consume. Shop window, Flying Tiger Copenhagen, Oxford St London

Discount Shops

Most of the shops are located next to residential areas which are passed by the local community frequently. The stores are mostly owned by international corporations and brands. These uniform corporate environments cause an anonymous relationship to the shop and a replaceable shopping experience.

A wide range of products, mostly household goods, is offered to low prices, mostly imported from China and offered depending on season and demand.





Flying Tiger, Oxford Street £££

Flying Tiger, Tottenham Court Rd £££





Poundland, Camden $\pounds \pounds \pounds$

Cally Pound Plus, Caledonian Rd £££



Argos, Angle £££



Muji, Tottenham Court Rd £££

Emotional User Journey: A Self-Experience

The shops are designed around exploring and discovering new products. After searching for a specific item, people find themselves buying things, which they didn't know before, that they even exist. Initially planned purchase intentions are replaced through impulsive and emotional driven decisions.

Brand and design play an important role in terms of lifespan and use over time. It also affects the relationship of customers towards a product.



Emotional User Journey (before, during and after shopping) Store Experience









Maker Space: Machines Room

Observations and an expert interview were conducted at the maker space 'Machines Room' which is part of the 'Maker Mile', a vibrant area of makers and designers in East London. (Maker Mile, 2017)

The space is filled with machines for digital manufacturing like 3D printing or CNC milling. Individuals can use the facilities for a members fee of £15 per month (Machines Room, 2017). Before people can work on their own, machine training will be required.

Most of the people who are using this space, are professional designers or makers who are working on specific projects.

In the following, the user journey of this maker space and projects around local production and recycling were analysed to identify opportunities and gaps of what role these new technologies and practices could play in the daily life of consumers.

Machines Room, East London

Maker Space User Journey

The making process of products is led by early adopters of new technologies. Experimenting and prototyping is in the focus of this design driven community. The place requires pre-trainings for machines and a fee-based membership. The manufacturing process is long and complex. It needs a high amount of user involvement which requires a high motivation, a creative thinking process and some sort of expertise.



Local Recycling

The project 'Precious Plastic' (2017) offers an open source opportunity to transform plastic waste into raw material for e.g. 3D printers. With this process, waste can be recycled locally and can lead to a closed loop manufacturing process.

The project is implemented into the `Machines Room'. Raw materials of plastic milk bottles from local restaurants were collected to produce new filament or products.

This way of turning waste into new products could change the way how production in urban environments takes place in the future.

Currently, the production process is in its early stages and yet not fully automated but it demonstrates today, how we might make use of plastic waste, tomorrow. (Visser, 2017)

Shredded

Material

Plastic

Waste



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"Most of the people who are using this space are professional designers or people with specific projects."

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Maker, 32

Local Production

The model of a circular economy not only questions how products will get back to the manufacturer to reduce waste and safe the value of materials, but it can also reduce carbon emissions along the entire supply chain (Ellen MacArthur Foundation, 2013). The report of the Ellen MacArthur Foundation (2013) states, that a lot of energy and materials are used in the production process and shipping of goods.

Digital and distributed local production might reduce emissions by the use and re-use of local materials, and also short ways of delivery to the consumer.

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Grapic inspired by WikiHouse (2017)

Recycling

Recycling is a practice which was seen by many participants during the project as a 'normal' and 'environmentally friendly' method to get rid of products. Some participants said, that it is a 'good thing' to "pop products into the bin for recycling".

40%

Only 40% of Europeans household waste is reused or recycled. (European Commission, 2015) Actual, recycling should be the last method to follow in the waste hierarchy of Reduce, Reuse, Recycle (Recycling Guide, 2017). The way of recycling is often very long until the materials get back to the manufacturer. The most efficient way of reverse cycles is to keep the loops as small as possible (Stahel, 2012), where materials go directly back to the manufacturer for remanufacturing.



nines Room, Ea

London Design Festival





MINI x Sam Jacob: Urban Cabin

During the London Design Festival 2017 which was held from the 16 to 24 September, the car brand MINI together with architect Sam Jacob explored new forms of urban living (Gibson, 2017) with the design of a micro house.

The concept addresses pressing topics like rising housing costs in cities, the rise of co-living and the merge of private and public spaces.

It asks questions about 'What do you really need?' to live in an urban environment and questions current architecture forms for residential living.

The rise of 'micro-homes' in the UK (Christie, 2017) and also the rising demand for temporary flats and co-living was also experienced during the research with users. Most of the participants stay in London only for a short period of less than 2 years. This short term of living causes new needs and also affects their consumption behaviour.

In the end, the concept of the 'Urban Cabin' proposed a design to the question of 'How might living in the city will look like in the future?'

Trashpresso

Pentatonic presented the world's first mobile off-grid recycling plant. (London Design Festival, 2017) In an interview with an architect of MINIWIZ, insights around the process of the recycling system were gained, which uses Starbucks coffee cups to up-cycle the plastic caps into tiles for the construction sector.

Penatonic also builds furniture from materials which were created out of waste. To reach a circular business model, they also set up a 'buy back guarantee' where all products will be taken back for re-recycling to turn them into new products. (Penatonic, 2017)

SPACE 10







SPACE10 Pop-up: Exploring Spaces of Tomorrow

During the London Design Festival, SPACE 10, a future-living lab from Copenhagen, was hosting a series of talks to explore how urbanisation will change over time and what consequences it will have on the spaces we live in. (London Design Festival b, 2017)

Talks around topics of urban planning, architecture, circular economy, internet-of-things and co-living created an overview about trends and challenges which will shape urban living in the future.

One of the most pressing topics was about the growing population and the fact that in 2050 nearly 66 percent of the world's population will lives in urban areas. (UN, 2014)

Questions rose about 'How might this growth will impact our daily lives in urban environments?' and 'How can we overcome these new challenges?'.

Anton & Irene (NYC): Co-Living

An interesting talk from the design studio Anton & Irene was about how this change is noticeable already today. More and more people move into the cities which causes the rise of housing costs. (Fletcher, 2017) The result is, that more and more people share flats with others, which created new forms of co-living.

Anton & Irene also stated, that new needs and values of Millennials created blurred lines between home, work & away.

How might these changes in lifestyles of Millennials affect the future of living in cities? How might the new needs and values impact the way people live and consume?

2.2 Co-Discovery

Co-Discovery Tools

To explore the research field together with users in a playful way and to gain insights about their drivers and barriers around consumption and consumer goods, two co-discovery activities were conducted. It was important in the early stage of the project, to create something tangible that will involve users in the design process. Both activities were interlinked and successively structured to be able to validate findings early.

Co-discovery activities were conducted in early stages of the project to involve users in the process. By creating something tangible, it was possible to gain useful insights right from the start.





Hands-On Market Stall

A hands-on co-discovery activity were set up to understand people's overall attitude towards consumption, their behaviour, product life cycles and usage. The findings resulted in the identification of consumption patterns.

Consumption Diary

A diary was designed to understand people's (daily) consumption to identify patterns, learn about their behaviour and relationships to retailers and products.



Co-Discovery I: Hands-On Market Stall

The first co-discovery activity was conducted in early stages of the project. To gain tacit knowledge about the consumption behaviour of the user group, a tool needs to be created, which engages the user with something tangible.

A hands-on market stall was designed, to get in contact with users in an natural environment. Everyday objects were painted white and abstracted to their neutral shape, to not distract users by their design.

The products were presented on a market stall at Hoxton Street Market in East London, which is an authentic local market.

The task for participants was to think about the objects in terms of their consumption behaviour. With the help of stickers, people could stick the place of purchase, frequent time of use, relationship and after use actions. Additionally they could also write in a short description about their purchase trigger.

The activity has helped to get in contact with the user group and allows listening to 'everyday stories' in a casual way It was also a good place to hand out the consumption diaries. Co-discovery with participants, Hoxton St Market London

All products were bought in discount shops around London for not more than £1 each. All are made in China and most of them are made from plastic.

To not distract users by the design, a neutral surface was created to transform the objects into `blank pages'.

A short instruction helped the participants to fulfill all given tasks. Individual stickers were designed to engage user in the activity and made it a fun and easy way to participate.





The overall design of the activity was kept really simple and focused on the main task. It should be a space where people can freely express their thoughts and opinions.



How it worked

Participants could choose as many products as they want and follow the instructions. The tasks for the participants were divided into the following five steps:

1. Purchase decision	Write on the product what the main trigger for purchase was.
2. Place of purchase	Where do you have bought the product?
3. Frequency of use	How often do you use the product?
4. After use	What will you do after you not need it anymore?
5. Relationship	What do you feel? Is the object

important for you?





"Something you just can't resell. It's cheaper to get a new one."

Man, 34



Sticker

"You move around and than you have to throw it away. It's funny because you buy the same things again for the new flat (...) You do not wanna carry them around."

Man, 29





"After a while I get bored of it, throw it away and buy a new one. I don't really care."

Woman, 26





Findings

The main idea behind the market stall was to spark the conversation about consumption behaviour and get in contact with the user group. The following everyday objects were generally seen as items which 'exist' in their homes but not really questioned by the participants. The purchase phase is impulsive and on-demand driven. The use phase is driven by everyday habits. When it comes to the end of life, almost every product were defined as disposable.



Cutlery Household

Cutlery is used by the participants every day. Most of them can not remember their date of purchase. Objects can not be sold because it is cheaper to get it new.



Hanger

Household

be disposed.

The object is not seen as `present' in the daily lives of the user. It only is, when it is broken or missing. Replacements were bought mand and for temporary on-demand in a shop next use. Users are aware of door and broken ones will their negative impact on

Plastic Cup

the environment but they

see no alternatives.

Household, reuse Household, single use Initially bought with disposal in mind, single use items have low value for users. They are needed on-de-

This object is seen by participants for being environmental friendly and saves also money while not buying drinks on-thego. Often the object were forgotten at home when it is needed.

Drink Bottle



Kettle Appliances

Some of the user bought their first kettles during their temporary stay in a flat share. Purchase decisions were based on a cheap price and convenient access in a local shop next door.

PingPong Rackets Sport/Leisure

Often needed on-demand and then never used again. Most of the time stored in the home unused. A cheap price beats quality.



Smartphone Case Fashion

The most fashionable item at the table. Often used by the user for identity affirmation. Bought impulsively without intention. Ends up in the bin after people get forgotten. bored of it.



Neck Pillow Travel

Needed on-demand and only for a temporary event. Mostly bought with disposability in mind. After use stored at home and be





Display of co-discovery tool

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Co-Discovery II: Consumption Diary

The co-discovery tool 'A Book of My Things' is a consumption diary to gain insights about people's overall consumption behaviour and how they use products on a daily basis.

The aim was to gain insights about consumption patterns, drivers and barriers, their lifestyles and values to define the motivation of consumers.

During the first co-discovery, the diary was handed over to people who have participated and were interested.

The diary is divided into six sections. It starts with a description of the participant. The next step was to give details about five given products, followed by a table of weekly consumption. The main task was, to describe objects, they have in their home. Questions about the reason of purchase, their relationship and what they will do after they will not need it anymore, were asked. The last section is divided into the pros and cons of ownership and what kind of items matter to them and things they do not care about.

Findings

The diary provides insights into the daily consumption habits of the user group. It was interesting to recognise that most of the products, people buy, are primary used in their homes. Almost 90% of all described products would end up in the bin after people will not need them anymore. The majority mentioned, that these objects are not worse to sell or gift because of low quality and it is often easier and cheaper to buy it new.



This is my FIRST

(adjective)

(product/item)

It looks like this ... Try to draw it. Don't worry, it doesn't have to be perfect.



These are important criterias ... Define criterias why you bought it? (e.g. price, situation, demand, place, design, brand ...)



they rust be atteap!

I own it because ... Why do you own exactly this item and not something else? What was the reason or decision?

L know it is such in a brives item here wilk but I be never needed in any howe country. It's so useful and I be just bought since it seemed a "rust that" here and I'll for sure buy it a fain in I taly! I bought it ... Where and when did you bought it? Why this place?

Online Shop/B&M

ASDA = cheap I thought I would a huse too much so I didn't care about "it's cheap so it will break faster" but actually I use it almost every day and it still works! ASDA was the only place where I bought all of my kirch marc and because it's convenient

l use it ...

How often do you use it? What is the main reason? How do you feel when you use it?

As I sand, I use it almost every day almo because it replaces my coffee machine somehow! I've never widthefore come here wilk but, r's sooo useful!

After I have used it, I will ... What do you do after you have used it or when you don't need it anymore?

£ Sell Dispose V H Give away 2 Others Since I'll move to Snew flat I don't have where to store it Awhile I'll bein taly so I will leave in my woren't flat and see if it will be there are I come back *

Keepit for me tilbune I will use it until ... What would be a reason to stop using it? (e.g. out of fashion, broken, moving, upgrade ...) I'll probably throw or pire it away as soosn as I'll more to my new/ future account dation since I course bring to my country (not enough space) but

* I'll civelleave it in my

corrent kitchen thet Anipa

will use so probably she'll

My relationship ... holidar Do you care about this item? Is it important for you in terms of identity, comfort or utility?



My excitement over time ... What was your feeling when you have bought it? Does it have changed over time?

() \bigcirc \bigcirc \bigcirc ()() \bigcirc \bigcirc Buy Use After Use

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Discover

2.3 Interviews

Interview Types

To understand the consumption behaviour and motivation of the user group of low-income and Millennials, insights of their daily life behaviours were needed.

Three different types of interviews were conducted to generate a range of different views and also use the various settings to validate my previous findings. Insights of motivations and relationships to products and retailers were gained. Interviews with experts in different fields lead to findings around new business models and 'real-world' challenges.

Three different types of interviews were conducted to emphasize with the user and gain deeper insights.

Contextual

To gain insights of every day practices, contextual interviews were conducted in front of the discount stores Argos, Flying Tiger, Poundland and other pound shops in central, east and north London.

In this natural environment it was able to gain insights about people's immediate purchases. Triggers were identified around shopping experience, product life time and after use.



In-Depth

Gained insights from contextual inter-

views and the co-discoveries, lead to

the creation of a card sorting tool for

in-depth interviews with students.

The cards point out critical points of

the purchase situation to spark the

The objective was to identify needs,

values and gaps in the consumption

conversation.

user journey.



Expert

Expert interviews with early adopters of new technologies and business models were conducted to gain insights of daily practices and learn from past experiences.

Interviews with one of the co-directors of the 'Library of Things', a member of the 'Machines Room' and an architect from MINIWIZ (Trashpresso) were held.

The insights range from drivers and barriers of users, new technologies and practices to the implementation and feasibility of new services.


Contextual Interviews

Contextual interviews were conducted with 13 people in front of Argos, Flying Tiger, Poundland and pound shops in North, East and Central London.

Price and Location: A lot of the participants value the cheap prices, the stores offer. Location is an important reason to a frequent visit, which in most cases is next to where people live or work.

Everyday Things: Most of the products people purchase are things they use in their homes. Typical objects were kitchen utensils, home accessories or household goods. The reason of purchase is nonexistents or replacement.

On-Demand & Short Lifespan: Temporary events like a garden party or festival were triggers for product purchases. Most of participants bought products with disposability in mind and a maximum use time of 6 month. Contextual interview in front of Flying Tiger, Oxford St London



"... I have bought it for a garden party. I think that I will only use it for this party. But maybe I will keep it over the summer, but not longer I think."

Woman, 32

"I bought things for my birthday tomorrow. It is only for the party, I don't know what I will do with it afterwards, probably pop it into the recycling."

Woman, 22





"I will go to a festival on the weekend. It's only for this event ... think I will throw it away there, I don't know."

Man, 22



In-Depth Interviews

The 6 in-depth interviews focused on students who recently moved to London for their studies or work. The participants were in an age range between 20-35 and living in a flat share. Uncertainty about their future (approximately next two years) can be recognized by all users.

Co-Living: The participants choosed to live in a shared flat, because of their low budgets and rising housing costs. They value the social contacts and flexibility that this form of renting offers. A lot of flats come furnished but even so, it is not professionally managed and most of the products which are in flats, are `left overs' from previous tenants, which needs to be replaced in the near future.

Temporary & Pragmatic: People make pragmatic decisions when it comes to their consumption. They see their stay only as temporary and therefore they do not want to invest in products, that they will use only a few times. Most of the things participants bought are products for their flat share, which were purchased with a short lifespan in mind. Buying something for their flats feels for them as a burden, because they do not want to move them around and it is easier and cheaper to get something new.

"I am pragmatic. When I will move, everything that is not expensive goes into the bin. Moving is every time an update on 'what do I really need!?'."

Oscar, 27

"... when I moved in, there was not so much there. I had to buy a lot of stuff new. I tried to keep it cheap because I will only use it for a short time you know."

Lisa, 24

in the flat of participant, North London

In-depthl interview

Findings

To spark the conversation about critical points of the purchase situation, a set of cards with important factors that influences a buying decision were created. The participants had to describe objects in their rooms on the basis of the cards. The following gives an overview about the overall findings:



Most of the user appreciate the local access to goods. When they need something quickly, they can just walk in and get the things they need. Compared to ordering online, most people do not like to wait for their orders.



Time is a crucial factor for the decision making process. The participants do not want to spend much time on research or decision making when they need to buy a product. Often they need it on-demand. They do not want to invest much time in something that feels 'not so important' for them.



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The user value the comfort that products offer to them at a daily basis. Not only the use but also the access offers this comfort. They can access products 'everywhere', because of the cheap prices and availability online/offline (e.g. it is easier and more comfortable to buy new when something is broken).



People really appreciate the design of a product but in the most cases, it plays only a minor role. When it comes to shared products, people do not feel the pressure to express their identity with a certain object. They value more the 'performance' than the product itself.

Quality

The quality of a product is seen in terms of durability, performance and materials. Participants value a good quality of products but often they have to prioritize the price because of a low budget. They also see no value in buying a good quality product when they have a short lifespan in mind.

Life Span

Participants know before they buy a product, that they will not use it a long time because of the situation they will use it for (e.g. temporary event) or that they will only need this for their temporary stay in their flat.

Flexibility

One of the most important factors was flexibility they miss. Product ownership is not flexible when it comes to moving or traveling. A lot of participants have to buy new things for their flats even if they have the same things at home but they can not move them around, related to lack of luggage and storage space.

Price

Almost all participants do not want to invest in products where they know that they will only use a certain time period. People buy extremely cheap, with disposability in mind. Often the decision making process starts with this mindset, which has influences on the whole user journey of a product life cycle.

Individuality

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Most of the participants see no necessity to express their individuality with the products in their certain life situation. They value more the access to it instead of that it reflects their personality or a particular relationship.

Sustainability/Eco-Friendly The participants have intentions that they want to consume in a more conscious and sustainable way. Though, in most cases, there is a gap between intentions and actions. Most actions that not follow their intentions are affected by time, situation and budget.



Expert Interviews

To gain insights about services who use new technologies and trends, interviews with two 'early adopters' were conducted. The maker space 'Machines Room' in East London and the 'Library of Things' (LoT) in South London.

The 'Library of Things' is a community space where people can rent out things on a daily basis. The container shop is placed in the middle of an residential area and provides over 300 things for low prices.

The interview took place with one of the co-director of the LoT and an Architect who was interested in implementing a LoT into a residential building.

Insights around feasibility and pain points were discovered, as well as how the place impacts the local community and their perception of consumption. "We set up this place not only to provide things but also build a community. A place where people come together, learn from each other and get help."

Co-Director, 28

"Today, when we plan residential buildings, we build in small gyms. But I think that you can find a better one down the road. I really like the idea to integrate a Library of Things instead of a small gym. This would add more value to the residents."

Architect, 43

Library of Things, South London

Findings

During an interview with one of the co-directors of the 'Library of Things' and an architect who wants to implement the concept in a residential building, following insights in terms of implementation and pain points could be gained:

Maintenance of Products

The Library of Things was initially started as a borrowing platform for local communities. The vision is, to transform the service to a city wide network that also contributes to a circular economy business model.

To reach this goal, a corporation between the service provider and manufacturer is crucial. The current model of the Library of Things lacks in terms of maintenance of products. The use-time of products will be extended but when a product is broken or reaches the end of its life cycle, there is no reverse cycle that brings products and materials back to the manufacturer. This can only be reached if the network of libraries extend, to create a high volume of products, otherwise it is not profitable for the manufacturer.



Location The Library (

The Library of Things is based in West Norwood, placed next to a quiet residential area. The location of the physical store is not only important for who will use the service but also affects what kind of products people need.

The top 5 most borrowed things are a Carpet Cleaner, Power Drill, Steam Cleaner, Hand Sander and a Garden Trimmer. These products are also reflecting the area where people live. In an urban environment near the city centre, the needs of people would be different because of their living conditions.

Physical Storage Space

For the concept of a Library of Things a physical storage space is needed. 30 sq meters for min. 300 products is required. The co-director stated, that after a while the temporary space of a container is getting to small for all the different needs and wishes of products in the community. There is also a lack of an efficient logistic system, which increases the need of labour.

Labour

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Another crucial point for the implementation into a residential building was around labour. "Who will run this place?". The Library of Things opens three times a week from 10am - 4pm. It is run by one paid staff member, four freelancers and four volunteers. In the meantime, their main goal is to become self sufficient.

The constant supervision and managing of the physical space is one of the most pain points to implement this kind of service into a residential building.

Community

The Library of Things was initiated to support the local community. The physical space is very important to connect people and also crucial for education. Sometimes people need instruction to tools and products. They can held workshops to train members and it is also a place where people can go to have a conversation about problems and how to approach them.

At the same time, with a physical location it is hard to reach people from other communities. Most of the people who uses the service live in an area of 2 miles.

Digital Management Platform

To set up this kind of service, it is crucial to have a digital management platform.

People like to see what they can rent out before they visit the place. In most of the cases they also want to book in advance.

To scale the idea to a city wide or global network of libraries, a consistent digital management system is needed, that let user profit from the connected network and that also contributes to a more efficienct way of operation.



Define

- 3.1 User Journey
- 3.2 Main Insights & Problem Space
- 3.3 Persona Creation

3.1 User Journey

The mapping of customer goals and touchpoints along the user journey paired with emotions, leads to identify gaps and opportunities.

Relationship to Products

The findings from the discovery stage have allowed to map out user journeys. In this process, it was not only important to map out the whole journey with user goals and actions but especially also the emotions and shifting value of products over time, to identify users relationships and motivations.

The research leads to the finding, that most of the consumption is related to current living situations of people. Most of products were bought for usage in people's flats and homes. The value of these products, for the owner, is very low, traced back to initial low prices and quality, impulsive and imprudent purchases and a temporary time of use. This leads to a weak relationship right from the start and disposal at the end of a products life time.

In most cases, items were bought with disposability in mind. When it comes to the end of use, they can not be sold or gifted, because they were already considered as worthless and therefore waste. People are impatient when something brakes or is out of fashion. They want to get rid of it as fast as possible to get a replacement. Unwanted or useless items were often seen as a burden at their end of life and an exchange often feels like a relief.



Emotional Journey

General User Journey

	Pre Purchase		Purchase		
	Si transformed and a second secon	9_9	Ø	<u> </u>	£
	Trigger/ Decide Need	Go to Shop	Search/ Discover	Compare/ Test	Choose/ Buy
Customer Goals	 Need to buy products for t a short usage in mind Do not want to spend muc It should be easy and quick 	 Need to buy products for their flat with a short usage in mind Do not want to spend much money It should be easy and quick 			they do not use only a better than easy
Touchpoints	- Flat Share - Internet - Local area	- Flat Share - Internet - Local area			
Pain Points	 People are frustrated that spend money for their sho flat share Products are not made for People have to buy, even it a few times 	 People are frustrated that they have to spend money for their short stay in the flat share Products are not made for short lifespans People have to buy, even if they use it only a few times 			chase ial cheap
Emotions	Disappointed Impatien	t		Utility	Cheap
	Annoyed	Annoyed In A Hurry			
	On-I	On-Demand			
	Spontaneous Surprised	Fast	Local		Easy + Fast
Background Details	 Moving into a new flat and Most of flats are parially fu existing products were left other tenants 	 Moving into a new flat and city Most of flats are parially furnished or existing products were leftovers from other tenants 			is because long way contacts city and do umption
Opportunities	What if the system is I lifespans and after us	nade with e in mind?	ls it necessar What if oth in the purch	y to buy and own er tenants might asing process: c consumption?	a the product? be involved collaborative

Use				After Use		
©		s and the second		~m	$\langle \rangle \rangle$	
Go Home	Unpack	Use	Storage	Use Again	Broken	Dispose/Sell/Give Away
- Using and sto a quick and c	pring the product comfortable acce	in their own ro	om to secure	 People are m People lost t People want People are b People get a 	noving and see the he product or it to change their ored of old stuff better product	nings as a burden is broken identities
- Public transp - Flat share - Private room	port			- Flat Share - Waste Containers - Luggage, Moving Boxes		
 product does price and base People do not because they that others with the theorem 	s not satisfy the u d quality ot share the purci y spend their own vill break it or it g	user because of hased item with n money on it. T get lost	the cheap in the flat, hey are afraid	 In their minds, they already ended their relationship with the product Want to get rid of it quick and easy See the physical products as a burden They see no (personal) harm in disposing 		
Нарру	First Time		Forget	Every Day	Bored	Easy + Fa Burden
New	r Unusual	Not Satisfied	Usual	Habit	Annoyed	Relief Out Of Fashion
- Measure exp at home - User see the	ectations on wha use of it only as	at they are used temporary	to have	 People are moving into another flat in the same or other city (country) They do not have much storage space or want to carry stuff around 		
What if phys shared? Ho access? How	ical products are ow might we secu might we motiva in their alread	e stored digitally ire a fast and co ite people to sho y share flats?	and can be mfortable are products	What if the e user journey	end of a product ? How might the over t	life becomes the hero in the value of a product increases time?

Main Insights & Problem Space

The validation of findings from previous research activities leads to main insights which have defined the problem space and helped to create a first research question.

Insight Mapping & Synthesising

In the discovery phase, the research focused on the consumption behaviour of the user groups around Millennials and people with a low income.

Observations, two co-discovery sessions and three different types of interviews have generated findings around peoples needs, values, drivers and barriers of consumption.

In each stage, it was able to validate findings to reveal following six insights, which were synthesised and clustered with the help of affinity mapping.



Main Insights

1 Our linear consumption model encourages unsustainable and inefficient consumption.

The result of our linear consumption is, that people buy with disposability in mind. Products, which are only needed for a short time period, end up in the bin, even if they are still in good conditions. This behaviour is traced back to cheap prices, the model of ownership and the mindset of a `throwaway culture' which is seen as a normal behaviour. Products are on their highest value when they are purchased. When they are in use, they only lose value. At the end of a products life cycle, the value is so low, that people see no other option than to toss it. With the disposal all value is lost.

The liquid lives of Millennials created a demand for more flexibility, independence and rapid turnover.

Uncertain and fast changing living conditions of the user group with a short run of less than two years, could be determined. Related to low budgets and high living costs, a majority of users live in shared flats, which is seen as temporary and common. The participants appreciate the flexibility of co-living, which best fits their future plans. Rooted in uncertainty, people can not plan in long terms. All circumstances affect the way how they consume. Temporary living conditions raise a demand for more flexibility and rapid turnover in terms of consumption and ownership.

3

2

Products are needed on demand and only for a short time span.

Temporary and fast changing living conditions of people causes needs to purchase new products frequently for their homes (room in a shared flat) and events in their daily lives. Rooted in the short term use and low budgets, the motivation of purchasing these items is very low. They are needed on demand and bought with disposability in mind, which is traced back to the inconvenience when it comes to moving. Often people also do not want to keep products because they sometimes already exist at the place where they move to or the quality is so low, that they see no value to keep them.



People see no value at the end of a products lifecycle.

5 Sustainability alone can not lead to a behaviour change. The end of a products life is often not caused by disfunction but changes in life conditions of people. If the product is no longer required (e.g. temporary event is over, move out, better replacement etc.), the relationship 'ends' for the consumer. The value turns to its lowest level during the user journey, which leads to disposal. This beahviour is rooted in initial purchase decisions which were based on disposability and short term use. Related to a cheap price and low quality, user see no personal harm in disposing and it is often cheaper and easier to dispose and buy new.

The gap between intentions and actions lead to an unsustainable consumption behaviour. The majority of the participants are environmentally conscious about their actions. Nevertheless, often actions do not follow their intentions caused, among others, by time, place, social environment, emotions and budget. Sustainability alone will not lead to a behaviour change because it lacks of a short term and direct impact on the individual life. Typical reactions are "I know, but the next time ..." or "Everyone else is doing it ... why should I change?" are typical reactions of participant reflections.



Local consumption plays an important role in terms of access, convenience and time.

Rooted in an on-demand need of products and a low motivation of investing time and money, the local consumption of goods plays an important role in terms of access, convenience and time. During the impulsive and imprudent decision making process, people decide on a convenient process. Most of the products were bought locally instead of online because of the existing availability, no need for individuality/ exceptional nature and time.

Research Question I

The definition of insights lead to the first research question which has guided the next stages of the project. The question is very broad and not defined, which opened up space for explorartion on the one side but on the other, it leads to uncertainty of the project outcome in this stage.

The question addresses two main problems, which were defined in the problem space.

Research Question I

How might a service for Fast Moving Consumer Goods based on principles of a Circular Economy enables a more flexible and efficient way of consumption which suits the needs and values of people's liquid lives in urban environments?

Problem Space

1. Close The Loop

The fist part of the research question addresses the issue around the shift to a circular economy and sustainability. To reach a regenerative economy where the aim is to change waste to resource (Braungart, McDonough, 2009), we have to think about what happens after a product is not needed anymore. Disposal has to be avoided, so that the value of the materials is not lost. Also the length of the reverse cycles of reuse, remanufacturing and recycling can lead to maximize the efficiency when kept as short as possible (Ellen MacArthur Foundation, 2013).

Oriented on the principles around reduce, reuse and recycle, a system is needed that is oriented on cycles and networks to keep the products at the highest value at all time.



Close The Loop

2. A more flexible and efficient way of consumption that suits the needs and values of people's liquid lives in urban environments.

Rooted in the insight that sustainability alone can not lead to a behaviour change, the second part of the research question deals with the problems of shifting needs and values of people 'liquid lives'.

The temporary living conditions of Millennials causes new demands of a more flexible way of consumption which challenges the idea of individual ownership. Ownership implies problems around inconvenience to fulfil only temporary needs and rapid turnovers, the loss of value at the end of a products life cycle and the responsibility for maintenance.

To address the demands of the new lifestyles, the next stage of the project will be about mapping values, needs, drivers and barriers of people to help identifying gaps and opportunities.



3.3 Persona Creation

The research findings and insights lead to the creation of personas. Following user journeys helped to identify gaps and opportunities to define the design space.

Insight Mapping

After the problem space has been defined, customer segmentation maps helped to cluster insights and the creation of four different personas. All personas are based on insights of people which were met during the research, but divided and clustered by their specific needs and values.

The Pragmatic	Young working professional who is very open and has a tendency to minimalism and disownership.
The Convenient	Student who lives temporary in London. A low budget and a stay in a flat share influences her consumption behaviour the most.
The `l don't care'	Sales assistant with a low income living in South London. She gets bored quickly and founds entertainment in consumption.
The Local	Local business owner who suffers from gentrification of his area. Wants to connect and help the local community.



Customer segmentation mapping, CSM/UAL London

User Groups

Following user groups has been defined during the research and their different behaviours has been clustered into main characteristics.



Consumption diary findings

The insights from the consumption diary also helped to define following personas. In the diary, participants could self-assess their main characteristics in areas around their general values which affact their consumption behaviour.

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Flexible	\bigcirc	\bigcirc	\bigcirc	\bigcirc		Flexible	\bigcirc	\bigcirc		\bigcirc	\bigcirc
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Independence	\bigcirc	\bigcirc		\bigcirc	\bigcirc	Independence	\bigcirc	\bigcirc		\bigcirc	\bigcirc
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because it's and cheap close. My office as well." is around the the bin (...) for recycling " corner." "When you travel Spoon corving work shop; you -you sometimes forget stuff and hing realise how long it takes + where then the materials SAVE IT bring come from buy -> relationship FORFUTURE identity GENERATIONS Flying Tigor etc - "Hhat's a good example - taux there you some fimes forzet shift and then you just buy stuff." something They nost certainly one Bargins, they ca

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Persona Development



CSM/UAL London

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The Pragmatic



Junior Consultant, living in East London

Gains	Pains	Values
Paul is an open guy in the end of his twenties. He lives a minimalistic lifestyle where every item he owns is questioned and had a reason why exactly this ob- ject. At the same time he is pragmatic, and sometimes radical in his decision mak- ing. He tries to make the best decision even these are at a small scale.	Paul lives in a flat share in central London. Sometimes he is annoyed about the accumulated stuff in his small flat. He then decides to radically get rid of things he doesn't use anymore or doesn't fit into his lifestyle. When Paul buys things, he goes with relatively cheap things because he knows that it's last not forever.	He likes about his job that he has to travel around a lot. In the next few month he will move abroad to work somewhere else. He likes to not be bound to any specific place and is open for new experiences. He cares about the environ- ment when he has the choice and it has a positive impact on his life.



Persona II

The Convenient



"When you travel – you sometimes forget stuff and then you just buy it. You can buy everything, everywhere."

Anna-Marie (24)

Student, living in North London

Gains	Pains
Anna-Marie is open for new experiences. She oves fashion and tries to be up to date. She likes the convenience of local stores where she lives next to. International brands represent her identity most but often she likes the story behind things, something that she reminds her on bast experiences with triends.	She moved from Spain to London for her studies. Therefore she has to deal with a small budget. She lives in a really small room in a flat share, where she doesn't have the comfort as she had back home. She tries to make the best out of the situation but also knows that this is only for a short time. She is also uncertain about where she will go next
	will go next.

Values

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She takes it for granted to have a convenient live. She expects the same comfort as she grew up with, therfore she doesn't question her actions or where things come from. She knows where to buy stuff she needs. It is important for her how things look like and also what kind of relation she has to the object (e.g. memory of a holiday).



User Journey: Anna-Marie

	1 – Trigger	2 - Decide	3 – Buy
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Customer Goals	Needs her clothes be ironed during her temporary stay in the flat share.	Needs to find a store where they are selling a range of cheap products.	Wants to buy the cheapest product in this category.
Customer Actions	Thinks about buying a cheap iron for her short stay.	Searches online for shops that are close to her flat and fit her price expectations.	Buys the cheapest iron she can find. Thinks that she do not want invest much in a product she will only use a few times.
Touchpoints	- Flat Share - Luggage	- Smartphone - Internet	- Local Shops like Argos, Flying Tiger, Poundland
Pain Points	Needs to buy new because it does not fit in her luagga- ge and it does not exist in the flat share.	She wants to buy something new because it is faster, easier and cheaper to get something new than search for something used.	She does not like to buy a low quality product but her budget does not allow her to buy a better one.
Emotions			
	"I need to ironing my cloths. I have an iron at home but couldn't take it with me so I have to buy one."	"I will only use it for my stay here in London. I think that I will not take it back home or where I will stay next. So I have to get a cheap one."	"I do not want to invest so much time and money in something that is not so im- portant. I need only a basic one, I don't care."
Opportunities	What if everything you need is owned by the flat? What if you have access to your things everywhere you live?	What if you have a plattform where you can browse a pool of products that you can rent out?	What if you do not have to buy the product but have access to it everytime you need it?

4 – Use	5 – Storage	6 – Use Again	7 – Dispose
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Wants her clothes to be ironed.	Needs to store the iron in her room to have a fast and uncomplicated access to it.	Wants her clothes be ironed again.	Get rid of it as easy and fast as possible.
Unpack the product and uses it for the first time.	Stores the iron in a shelf which is in her room.	Takes the iron out, use it and put it back to its place. She is using it not very often. After a while it doesn't work very well anymore.	She has to leave the flat and the iron does not fit into her luggage. She puts it together with other stuff next to the waste containers.
- Flat Share - Own Room	- Flat Share - Own Room	- Flat Share - Own Room	- Flat Share - Waste Containers - Storage Box
She is not really satisfied because of the bad quality. It is not the same as what she uses back at home.	She doesn't like to store it in her small room but she also does not want that others will use it and it gets lost. She doesn't use it very often.	She is disappointed of the bad quality and ask why she could not get the same stuff she has at home.	She is happy that she does not have to use the bad iron anymore but also annoyed that she has spend money on it for this few times she has used it.
		;	;;
"It's not as good as mine I have back at home but I think for this short time it will be ok."	"I will store it in my room. I do not want that someone else use it – than it's broken or lost, you know."	"I am a bit frustrated that I have to use so shitty stuff. I have to buy everything new here for this stay."	"I only used it a few times and now I have to throw it away. This was really not worth the money."
What if the manufacturer of the products cares about that you have the newest and best quality product at all time?	What if everyone in the flat share has access to a pool of products that can be borro- wed permanantly or tempo- rarily when its needed?	What if you do not have to care about maintanance?	What if you can give back products you do not need anymore? What if you can exchange broken products for a new one?





Sales Assistant, living in South London

Gains	Pains	Values
In the first place, Berth wants comfort. She wants to avoid to much hazzle and doesn't like the unknown. New things are better than old and when something is broken, of course, buy it new: "it's only a quid, so what". She buys what comes in her mind or is on sale. Berth wants to have fun and doesn't care so much.	Berth is impatient. She gets bored of things very fast. If she didn't get what she want, she gets angry and finds something/-one to blame. Often she wants more than she can afford with her low budget, therefor everything has to be cheap. She follows what other people around her are doing and doesn't leave her comfort zone.	Her future is very uncertain and she didn't have a real plan for life. She searches for entertainment in cool new things, even she gets bored of them very quickly. She likes when everything is ready to consume and she doesn't have to think about it, becuase she doesn't want to spend much time on 'boring stuff'.



Persona VI

The Local



"I lost a lot of regular customers through gentrification of the area. I can't compete with global businesses. In the end my customers decide where they buy."

Robert (54)

Local Business Owner, living in East London

Gains	Pains	Values
Robert runs his business for 30 years. He opens it to support his family and also serve the local commu- nity. He sees his kiosk as a meeting point for the neighbourhood. It is really important for him that he to have a positive influence on the area and that he gets involved in local deci- sion making.	He is working too much, even on weekends, he sometimes has no time for his family. Sometimes he sits hours in an empty store. Customers getting fewer and fewer which is related to the gentrifica- tion of the area. Back in the days he knows most of his customers by name but now, he lost the connection to a lot of them.	Robert cares about his surrounding. He helps where he can and knows a lot of people, even if a lot have to moved out because of the rising housing prices. He likes to have a personal connection to his cus- tomers. At the beginning the business was set up to make money but now it has become more a place for him to connect to people.



User Journey: Berth

	1 – Trigger	2 - Decide	3 – Buy
	, ,		
Customer Goals	Wants to replace a broken hanger in her wardrobe.	Needs to find a store where they are selling hangers.	Wants to buy groceries and has to also buy new hangers.
Customer Actions	Disposes the broken plastic hanger. Thinks she can not use it anymore.	Writes a note that she has to buy hangers the next time when she goes shopping.	In the supermarket she sees a 5 pack of plastic hangers. She thinks that those are not the best but solve the problem for a while.
Touchpoints	- Flat - Wardrobe - Hanger - Garbage Bin	- Smartphone - Online - Notes	- Supermarket - Offer
Pain Points	She is annoyed that this happend. Now she has to spend money.	She has to remember the next time when she goes shopping to buy some hangers.	The hanger does not have the best quality but she does not spend much time and effort on it.
Emotions			
	"Why does it brake? Now I have to buy a new one. I do not want to spend money on things like that."	"Where do I get hangers from? I try to get them the next time I go shopping."	"Oh, didn't expect that they have some in the supermar- ket. They are not so nice but will work for a while."
Opportunities	What if products are part of a system that can be exch- anged when needed? Support the customer when she has a problem with a product.	What if resources can be seen as input for new pro- ducts? Encourage the customer to bring back old materials.	What if Berth does not have to buy new? Create a worry free expe- rience.

4 – Use	5 – Storage	6 – Move	7 – Dispose
	Â		
Needs to place the new hanger in the wardrobe.	Needs to have a partly orga- nised wardrobe.	Needs to move a new flat.	Needs to get rid of them as easy and fast as possible.
Brings the purchase home, unpacks the hangers and place them in her wardrobe.	Uses the hanger everyday even if they are only a 'part of the system' and inconspi- cuously.	She has to move all her stuff to another flat and she has to put all her stuff out of the flat.	She put all the hangers and stuff she will not carry to the other flat into a garbage bag and puts it into the waste containers.
- Flat - Wardrobe - Clothes - Garbage Bin	- Flat - Wardrobe - Clothes	- Flat - Moving Boxes - Waste Containers	- Flat - Waste Containers - Garbage Bags
She isn't happy about that they don't fit the other han- gers. The quality is very low but it will work for a while.	She forget about the pro- duct after a while. She does not care about these little things.	She needs to throw the hangers away because she will buy new ones for the new flat. She will not carry around this cheap stuff.	She is annoyed that she has to empty the whole flat and move all her stuff to the new one.
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"They not match with the others but I don't care. They were so cheap, it is ok."	"I can't remember where I bought those hangers the last time."	"I will not carry around this cheap stuff. I will buy some new ones when I am in my new flat."	"It is easier for me to throw everything away."
What if the products are part of a modular system?	What if she has an overview about all the stuff she has bought for her flat?	What if basic things belong to the flat and she can easily leave all the stuff there and only carrys around things that have a meaning to her?	What if she does not have to throw anything away?

Develop

- 4.1 Design Space
- 4.2 Co-Design Toolkit
- 4.3 Co-Design Workshop
- 4.4 Prototyping & Testing

4.1 Design Space

The design space sets the parameters for the next step of the project. It defines crucial criteria to help address the problems which were identified in previous stages.

Affinity mapping, CSM/UAL London

Insight Mapping

The develop stage started with defining the design space and setting up a design brief. Design criteria and values as well as drivers and barriers were generated through a short affinity mapping and clustering of the problem space.

To avoid the narrowing of the project outcome in this stage, the criteria were held very open to left space for inspiration and creativity.

The design space should be set the parameters for the co-design workshop and help participants to take these criteria into account while designing possible scenarios.



Design Criteria & Values

The design criteria and values are created around the main insights and the defined problem space which is divided into two areas: closing the loop and shifting values and lifestyles of Millennials.

The design should help to create a more flexible way of living which means that it should respect and encourage the lifestyle of Millennials who are temporary living in London.

It also should be add value at the end of a products life cycle that would prevent users of being wasteful and encourage them to step out of a 'throwaway culture'.

The service should see products as part of a system which is not designed around disposability but around loops and cycles where products float back into a system that encourages reusability and re-manufacturing to preserve value.

Drivers & Barriers

One of the main insights was that sustainability alone can not lead to a behaviour change. Even if people are aware of, there is a gap between intentions and actions.

An overall driver is our environmental responsibility but on the other side there is no personal need to change. People will only change to a new system and adopt different behaviours when the system is better than the old one. (Braungart, McDonough, 2009) Better means, when it adds value to their daily lives with short term effects. Sustainability instead has long term impacts, which does not influence the live of the user instantly. When sustainability would be the only driver, the motivation of the user to change is very low. Therefore sustainability can be only seen as a side effect of a system, which is designed around specific needs in the daily life of consumers.

Help to create a more flexible way of living

1

Add value at the end of a 2 products life time

Bring products back into 3 the cycle

Guide and support users 4 for being more sustainable

Support local community 5 and encourage their engagement

Drivers +

- changing values and lifestyles
- environmental responsibility - safe money
- create convenience
- reduce waste

Barriers

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- uncertainty about future - inconvenience of being
- sustainable
- no personal need to change
- low budgets

Stored Value of Digital Products

As mentioned in the first chapter, within a linear economy, products reach their peak value when they are purchased. When the product is being used by the consumer, most of the products start losing their value. At the point of disposal, they already have lost all their value for the user, so that there is no other option than the bin.

Digital products instead have stored value and getting more valuable for the user over the time of use (Eyal, 2014). Through "added data, content, followers and reputation" the user is actively involved in the process of value creation and it depends on his effort, how valuable a digital product for him will become in the future. (Eyal, 2014)

Question

How might a digital service layer can create value for the user at the end of a products lifecycle?

What if we can add a digital service layer to physical products so that value is created by the user during time and not lost by using it? An example for this could be the model of 'access-over-ownership' (Rifkin, 2000), where a digital layer builds a loop of value creation by providing access to products when they are needed, like car or bike sharing.



4.2 Co-Design Toolkit

Research findings were clustered and condensed into methods cards, which were used for the creation of future scenarios and stories.

Affinity mapping, CSM/UAL London

Creating The Toolkit

After the design space has been defined and all insights have been mapped out, a co-design toolkit was needed to engage workshop participants. A set of methods cards seemed to be a good tool to bring all the findings from previous research to the table and it also allows enough space for creating own ideas. It is an open tool which is modular and can be combined and 'played' in different ways. The idea was, that people can combine all cards from different categories to generate future scenarios and stories.

The creation of the toolkit started with a mapping of all relevant topics and findings from previous research. These topics were around identified needs of people like flexibility, low budget and comfort and also actions like dispose, take back or sharing. The cards also include preferable behaviours which will be needed to enable a circular economy like re-use, local production and access-over-ownership.

All findings were clustered into following five different categories: Need, Action, Location, Product and Magic. The categories were the result from pervious research but they are also identified as key elements of a storyline. The Magic card allows the participants to integrate a special element like love, fun or transparency which was often seen as important drivers of the decision making process for people.



Method Cards

To spark inspiration for the creation of future scenarios during the co-design workshop, the following method cards were created. The cards represent crucial findings from past research in the areas of Needs, Action, Location, Product and Magic. Each card states one word, followed by a short explanation and a 'What if...' question.

With the help of a 'What if...' story template, the cards can be combined by participants in different ways to create diverse stories and scenarios.



Future Scenarios



⊖Need

1 – Fast

Need

Fast

actions.

In our fast-moving post-

modern world speed is an important driving force that has implications on our

What if the service not only provides a fast access but also a fast way to get rid of

things in a sustainable way?

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In our fast-moving postmodern world speed is an important driving force that has implications on our actions.

What if the service not only provides a fast access but also a fast way to get rid of things in a sustainable way?

3 – Cheap

The initial costs of FMCGs are really cheap. But every time when you throw them away you lose the whole amount of value.

What if there is a system that saves you money in a long term even if the initial costs are higher? How might we communicate this value to the user?

5 - Spontaneous

Our consumption is driven by impulsive purchase decisions which is triggered by an on-demand need. Therefore often our actions don't follow our intentions.

What if the model encourages a sustainable consumption without that the user has to think about it?

7 – Flexible

Ownership has its downsides when it comes to storage space, maintenance or disposal. There is also pressure of identity affirmation with each object we call our own.

What if the system leads to more flexibility not only in physical constraints but also in terms of changing identities?

9 – Short Time

Most of FMCGs are often used only for a short time. They are bought with a short lifespan in mind whereby the products are not designed for such a short lifetime. What if the system is made with lifespans and after use kept in mind?

2 - Comfortable

The city enables a comfortable way of accessing products. Ending a product relationship is also easy but often not very sustainable.

What if there is a system which makes the use of products even easier than today? What would be those new parameters of comfort?

4 - New

Brand new is the norm and a driver behind todays consumption which ends up in rapid turnover of products.

What if old things become more valuable than brand new ones over time? What would be the drivers behind choosing 'old' instead of 'new'?

6 – Everyday

Some products we use everyday, therefore we need to access them quickly at any time.

What if the model ensures an uncomplicated everyday access to products without the need of ownership for the user?

8 - Identity Affirming

'We are what we buy'. Objects not only serve utility but also reflect our identities. What if the system allows more rapid turnovers of identity-affirming consumption goods? What if the use of the service and not the products reflect someones identity and intentions?

10 - Impatient

The consumption model of our fast moving world, is based on the fulfillment of consumer needs with increasing expectations. What if we think about positive sides of impatientness (e.g. anticipation) and use them to create an exciting experience?

11 – Dispose

Action Dispose

Disposing like using a household bin or public recycling container is not rewarding and is often be seen as a nuisance. What if the end of a product life becomes the hero in the user journey? How might the value of a product increases over time?

11

Disposing like using a household bin or public recycling container is not rewarding and is often be seen as a nuisance.

What if the end of a product life becomes the hero in the user journey? How might the value of a product increases over time?

13 – Take Back

We buy products to fulfill certain needs. When they don't meet those anymore, we want to get rid of them.

What if we make it fun and fashionable to use goods instead of consuming them? How might bringing back is cooler than throwing out?

15 - Lease/Subscribe Access and utility is often more valuable than ownership.

What if customers pay to access the product for a certain period of time? How might this system be more comfortable as owning?

17 - Order & Deliver

Today, everything we need can be ordered via the internet. This is smarter than storing all the goods in the city – but shipping is very polluting and inefficient.

What if we deliver not goods but information? How might the different stakeholders work together?

19 – Buy

The act of buying is an exchange of values. It designates someone as the owner. The point of buying is where the product is at its highest value along the user journey. What if buying provides access but not ownership of unwanted raw materials?

21 - Pick-Up

With ordering goods in the internet the need of delivering arise. Amazon has installed locker in local areas which people can use as a shipping destination.

What if the user can pick-up their products next door? How might this system can be used for after use actions?

12 - Re-Use

Keeping products on the highest value at all time is a main goal for sustainability. What if we can re-use products or their materials to keep the value for users on a high level at all time? How might we motivate users to choose 're-using old' towards 'buying new'?

14 - Share/Rent

The city has to be seen as a network of people where products and materials are floating.

What if products and materials are shared within the local community? What are the advantages and benefits for using this system instead of buying new?

16 – Make

The IKEA effect is a cognitive bias in which consumers place a disproportionately high value on products they partially created. What if the value of a product lies in the making process? How might we create the making process as simple and engaging as possible?

18 - Repair/Exchange

Often it is cheaper for the customer to 'buy new' instead of 'repair old'. What if we encourage people to exchange 'old' for 'new' to prevent inefficient disposing of raw materials? How might old become 'gold'?

20 – Reward

The 'hook canvas' explains that desire follows the pattern of trigger, action, reward and investment.

What if the system rewards the user for sustainable behaviour? How might we use variable schedules of reward to hook users?

22 - Collect

We collect and separate waste in our homes until the garbage truck will move it to a centralised place.

What if old products can be collected in the local neigboorhood and be used for new products? How might we encourage and reward users to take part (on both sides)?

23 – Store

Physical items are stored with limited storage space in our homes to secure a fast access at every time.

What if physical products are stored digitally? How might we secure a fast and comfortable access and at the same time enable a `living in the cloud'?

$\ensuremath{\oslash}$ Location

24 – Flat Share

Sharing a common space is becoming the new normal. In this place, people are often deeply connected and having a close relationship.

What if the products are not owned by the flatmates but instead by the house/flat? How might we share products in a shared space?

26 - Local Hub

Small businesses like kiosks, repair stations and shops are located next door.

What if locations in the neighboorhood become a new hub of exchange? How might the circulation of information, products and materials could serve the community?

28 – Digital

Through stored value like content, data, reputation and followers, the value of digital products and services increases over time.

What if we can add a digital layer to physical objects? How might ownership also exists digitally (e.g. stored in a digital library)?

30 - Neighbourhood

The neighbourhood is a small area of the city where people are frequently and closely connected.

What if the network of people and spaces allows a circulation of information, products and materials?

25 - Co-Working Space

The working space is a place where people spend most of the day together with other colleagues.

What if we use this centralised place and the connected community to create a circulation of goods, materials and information?

27 - Shop/B&M

Traditional shops are located all over the city. They are easy accessible for customer but the relationship is often impersonal and faceless.

What if the relationship between a local shop and the customer is not only one way but still exists beyond the period of purchase and use?

29 - Public Space

Spaces in the city like parks, train stations or places are located centralized and publicly accessible.

What if these places become interlinked with local shops? How could you get rid of things instead of throwing them into the public bin?

31 - Vending Machine

In an automated process, a vending machine provides users after payment with phyisical items.

What if machines provide the community products and also ensure that materials flow back into the system?



Flat Share Sharing a common space is becoming the new normal. In this place, people are often deeply connected and having a close relationship.

♀ Location

Product

Served Product Design/Fashion

The design of objects plays often an important role in the decision making What if the design story behind the product can be used for more sustainable consumer behaviour? How might storytelling can be used to add value to an item during the whole life span? 32

32 - Design/Fashion The design of objects plays often an important role in the decision making process.

What if the design story behind the product can be used for more sustainable consumer behaviour? How might storytelling can be used to add value to an item during the whole life span?

34 – Travel

Traveling causes needs for things we only need a short time. Sometimes we forget stuff at home and have to buy them on our journey.

What if you have access to your belongings all over the world? How might we enable a "living in the cloud"?

36 - Waste

We collect and separate waste in our homes until it will be moved away to a centralised place.

What if we could use neighboorhood waste (e.g. plastic bottles, packaging) and use it as resources for new products? How might we encourage and reward users to take part (on both sides)?

38 - Tools

Bought on demand and used only a short period of time, tools are stored most of the time unused in our homes.

What if tools can be requested when they are needed? How might we access and get rid of these products in the local area?

33 - Household

Things we use for our home will be accumulated over time until we don't use them anvmore.

What if things are designed for on demand use? How might we provide comfortable and flexible access to these things?

35 - Party

Things will be bought with a limited time of use in mind where the value is gone after it is not needed anymore.

What if products are part of a system which encourages re-use of things and materials? How might we replace single use items and carry out a behaviour change?

37 - Sports & Outdoor

Special events or tasks causes new needs for products that we don't use on a daily basis.

What if products can be returned after the event is over and the product is not needed anymore? How might the value of the product did not go down after usage?

☆ Magic

39 - Local Production

Digital decentralised fabrication technologies like 3D-Printing enables efficient and sustainable local production.

What if we can use local production techniques to enable use and reuse of local materials? How might different stakeholders be connected?

41 - Access Over Ownership

Ownership not only provides access to goods but also transfers full responsibility of control, maintenance and disposal to the user.

What if products are part of a system where the user do not has to care about maintenance, storage or disposal? How might we retain control and ensure access?

43 - Fun

People desire what makes them happy and is delightful. Variability is the driver that keeps fun up over a period of time.

What if fun is not only part of the product but also of the whole user journey? How might we keep up the fun along the period of use?

45 - Independence

The security of access and control are two important qualities of ownership.

What if people have the full independency during the use of a product but when it comes to the end, they can rely on a guided system that cares about after use?

47 – Big Data

'Data is the new oil'. It's collection and analysis can lead to more efficiency. What if we might use data to learn how people use products and what they waste to adjust and provide a customized service? How might data be collected?

49 - Transparency

We don't know much about what we consume due to an in-transparent, complex supply chain.

What if we can tell the story behind the product and let the consumer know where it comes from, who has made it and who has owned it before?

40 - Local Community

The layout of a city created a living situation where people live next to each other without knowing one another.

What if products, which are used in the local communities, are also made and recvcled locally? How might we bring people together and encourage them to collaborate?

42 - Love

People care about what they love. It keeps relationships together or has the power to separate them.

What if a relationship to a product evolves over time? What are the different stages and how might we end a relationship in a good way for both sides?

44 - Social Equity

Consuming is a democratically available way of affirming insertion in mainstream society.

What if we provide access to products for everyone, everywhere? How might we use the end of a products lifecycle to create new local jobs in the neighbourhood?

46 - Open Network

'Think global, act local' is enabled by the power of a global network. Openness is its driver for diversity and inclusivity.

What if people can access, produce, store and share products through an open network? How might different stakeholders be connected?

48 - Personalisation/Modularity

Our consumption model is based on products that are standardised and mass produced.

What if there are no standardised shops (e.g. supermarkets) and businesses provide their products directly to customers through tailored services?

50 - Internet Of Things

The internet emerges into our physical world. The connection of sensors and the analysis of actions can be used for predictions.

What if products can sell themselves when not used? How might things interact with users to encourage sustainable actions?

Digital decentralised fabrication technologies like 3D-Printing enables effi-cient and sustainable local

production. . What if we can use local production techniques to enable use and reuse of local materials? How might different stakeholders be connected? 39

Local Production

\star Magic

Co-Design Frameworks

The following frameworks were created to keep track of all ideas and help to map different concept elements to identify gaps and opportunities. It also helped participants to engange with other ideas and fuled a creative exchange.



Selection

Circular Economy Framework

The framework is oriented on the stages of a product lifecycle within a circular economy.

It starts with the 'business & design' of the product. It questions the business model which has an impact on the design and also the following production process. The next stage is about how people can access the product. Is it based on ownership and purchase or can it be leased or rented? The next two stages are about the use of the product and what happens, when the user does not need it anymore?

It was helpful to identify essential connections between the relationship of product, consumer and business to create a closed loop.

Concept Selection Matrix

The concept selection matrix was used to evaluate ideas and concepts. It is divided into 4 segments with a range from *High Impact* to *Low Impact* and *Easy to Achieve* to *Difficult to Achieve*.

This mapping helped during the process to see what kind of concepts and elements work and where ideas have to be refined.

It is an engaging tool where all participants can come together and discuss.

The tool was used several times during the workshop and later on in the process to evaluate and iterate design decisions.



Behaviour Change

This poster is inspired by 'Five Levers for Change' of Unilever (2013).

The shift from a linear to a circular economy needs also a shift in the attitudes and behaviours of consumers (Early, 2016). For this reason, Unilever (2013) created a set of five principles to inspire people to adopt new behaviours. The five principles are around topics like education, convenience, needs, motivations and adoption.

Even of behaviour changes take place on a small scale (e.g. history of 'hand washing'), they can have a big impact on the whole system.

The poster was made to inspire people and also used for asking questions and challenge ideas.

Social Innovation

To spark the conversation about social innovation and also bring in a discussion about implementation and feasibility, three principles of John Thackara (2015) were pinned on the wall during the workshop.

These principles address issues around already existing systems which will be crucial for an implementation of new services and a set up of pilot projects. Thackara also mentioned that it is important to empower local people and think whole systems. Each rearrangement of existing relationships is an "exercise of power" (Thackara, 2015).

During the design process, all these three principles were considered to the greatest possible extent.

4.3 Co-Design Workshop

A co-design workshop together with designers and future users was conducted to create ideas and identify potential future scenarios.

Participants during the co-design workshop, Düsseldorf

The Workshop

The co-design workshop was set up to not only create ideas and future scenarios but also gain insights about how users think, to start a discussion and let people bring something tangible to the table.

The eight participants were mixed, half designers and half future users, to create a creative exchange and build on the ideas of others. The methods cards were used to spark inspiration and prevent the `fear of the blank page'.



Workshop Agenda





After the ideation part, all participants pre-

sented and discuss their stories within the

group. All parts of the different ideas were

mapped on the circular economy framework,

N

to identify overlaps, gaps and opportunities.

1. Create

Together with a framework, the method cards were used for story creation. Each scenario starts with a 'What if...' question. Participants could write or draw the story based on five different method cards and bring their ideas to life.



3. Refine

All participants have chosen together four ideas to develop further. Groups were divided into four teams to develop each idea. After 10 minutes the groups rotated and refined the ideas of the others until each group has been refined eachothers idea.

4. Prototype

2. Map

The result were four different ideas and concepts which were prototyped in form of a scribble and a short story. Each team presented the final ideas and discussed the workshop and process.





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Future Scenarios



What if products you use in your flat share belongs to the building and can be shared within the community?

A lot of things people store in their flats are used only a few times a month. Why not sharing these unused things with people around you?

Each community member who lives in the apartment complex has access to a locker which provides products which can be lended for a certain period of time. The residents can lend out different kind of products like a vacuum cleaner, tools, a tent or an iron.

These kind of products were only needed for a short period of time and can be easily shared. All products are provided and maintained by their manufacturers to close the loop.

With key tokens of the main door, tenants can open the locker doors, which are transparent, so that people can see what is inside. Product can be lended for max. 24 hours and have to be put back into a free locker.

What if you can store your stuff in the `cloud'?

When people move, they often buy the same things they already have at home or had to sell because they can not take it with them.

In this scenario, people can store their things in the 'cloud'.

Today, almost in every country you have the same stores and brands who provide almost the same products.

What if people could take back the things to the brand, they have bought in their home country and get it again from a store in the country where they have moved to? People can buy a product once and get access to it all over the world.

When you have forgotten your GoPro camera while traveling, send a message to a friend who owns one and say that he should bring it back to the store. After that he can send you a link/ code and you can get access to the same camera in the country you are staying in.





4

What if you can 3D print and recycle products in a local hub?

Shipping things around the world for using a product for 30 seconds like a plastic coffee spoon is ridiculous. Why not produce things in your local neighbourhood to minimize the footprint?

In this scenario, local business owners can implement a 3D printing and plastic recycling service into their existing businesses.

Product designers and businesses can implement the service into their websites, so that users can select printing shops nearby and pick up the product when it is printed.

When they do not need the product anymore, they can bring it back to any recycling places and receive a digital form of deposit for the materials which they can use for their next print.

The returned plastic can be picked up and recycled in local recycling places and used to create new filament for the 3D printers.

What if products circulate between stores in the city?

Often things are used on the go, while stored at home. A good example for that are umbrellas. People have plenty of them at home, but when they need one, they forgot it and have to buy a cheap one in a store close by.

What if you can buy things, use it on the go and take it back when you do not need it anymore? What if we can make use of the network of stores around the city?

This scenario takes place in a world, where stores of the same brand in a city work closely together. They act as a network and products circulate between these stores.

Mapping

Mapping of Impact & Achivement

The four ideas, which were developed in the workshop, are mapped on a matrix to find out which idea is best to follow and also to see what needs to be improved to make it feasible.

Some of the ideas are difficult to achieve and their impacts are limited to a specific area. It turns out, that ideas around local production are difficult to implement because a completely new ecosystem consisting of different manufacturing, recycling and remanufacturing facilities has to be implemented from scratch, to achieve a closed loop system.

This mapping leads to the finding, that it is crucial for a feasible implementation to make use out of already existing systems, infrastructures and networks.

The idea around co-living was interesting because it sees the products as a part of system which is already set up.

Mapping of Directions

The created ideas were abstracted and clustered into their core directions. The areas can be divided into co-living, access over ownership, local production and sharing.

It could be realized that not the ideas themselves were the main output of the workshop but more the directions and topics about the participants have been thought.

The aspect around co-living and the way how people live, seems to be a main driving force behind their consumption behaviour. This direction leads to further desk research and a mapping of interlinked issues.



Co-Living



Lifestyle imposed

architectural form.

The current form of

flat sharing is a form

of hacking housing.

people live affacts

their needs and in

the end how they

consume.

The way of how

3

Concepts which were developed in the co-design workshop were mapped, to find out which would best fit the users needs. A general finding was, that the most valuable output of the co-design workshop was not the developed ideas themselves, but more the directions in that people have thought.

The topic of co-living leads to desk research around the history of communal living and also the history of how we became a society which is driven by consumption. It was interesting to realize that the way how people live has significant affected their consumption behaviour over time (Trentmann, 2016).

The historian Frank Trentmann (2016) mentioned, that with the industrialization we entered the 'living-room' suite, where the home became a place which has to be filled with goods and machines. In the last third of the 19th century, Trentmann (2016) states, that modern living was build around three core ideals: comfort, privacy of the family (one room per person) and the believe that each room should be separated by its function.

Today, we see that this structure of modern living will be 'hacked' in form of flat sharing and the idea of co-living (Collinson, 2015). During my research I found out, that there are new needs and values of the generation around the Millennials in terms of a fast changing locations which causes the need for a more flexible way of living.

Most of the flats which are shared were initially not designed for co-living. Rooms like the kitchen, living-room and bathroom became common areas and therefore also products, which were part of these rooms, started to be shared. In most of the cases, products were 'leftovers' of previous tenants that have been accumulated over time. Tenants are often self-responsible to furnish the flat, even if they are only staying for a short interim time. If basic elements are existing, there is no professional management of those.

It can be said, that the system of housing does not fulfill the changing needs for this 'new' form of living. Durable products were purchased by tenants with a 'short term' mindset. People consume in a way that does not fit to their living situation. Today's form of consumption is not made for sharing and 'short term' use because it is based on the idea of individual ownership and a 'long term' thinking rooted in the linear economic model.

Trentmann (2016) mentioned, that during time "the home was shaped by the people who lived in it". This rises the question of how might we shape the form of consumption so that it fits these new forms of living and lifestyles? How might we create a better experience for co-living which is based on principles of a circular economy to address the new needs and values of Millennials?



Refining The Brief

The findings from the co-design workshop and mapping of concepts lead to new insights, which had influences on the first research question and therefore the further design process of the project.

With this new input it was able to define a second, more precised and tailored research question.

The problem space around the circular economy and 'closed loop systems' as well as the changing values of Millenials around a more flexible and efficient way of consumption can now be narrowed down to the area of co-living and systems of flat sharing.

The focus was needed to use an existing system where the service concept can be implemented and also address the overall problem, which might lead to the creation of an impactful solution.

Process form Research Question I to II



Research Question II

Research Question II

How might a service contribute to a better co-living experience for Millennials who stay temporarily in London?

4.4 Prototyping & Testing

After the concept has been defined, different scenarios have been prototyped to test with users and stakeholders, to refine the concept.

Future Scenario

The future scenario is based on the ideas which were the output of the co-design workshop. After refining the concepts and the research question, the following future scenario was created, which were prototyped and tested in the next instance.

Important for choosing this scenario was, that it respects already existing systems which makes an implementation and testing with stakeholders possible.

Flat share agencies and landlords were integrated as new stakeholders in the concept, who will be seen as the service provider, to manage and operate the service.

Future Scenario

What if products you use on a daily basis are owned by the flat you are living in, which is connected to the manufactures to provide a `closed loop' service?



Prototyping

To bring the scenario to life, different user journeys were sketched out, which helped to map out all relevant touchpoints for creating a first lo-fi prototype. Sketching out an app interface and creating a rough paper prototype leads to get first feedback from users. With these findings, iteration of ideas and the creation of wireframes and screen designs started.





Testing With Users

The paper prototype was tested with students and tenants and afterwards transformed into a high-fidelity digital prototype.Feedback on usability but also the overall service concept were gained. The participants appreciate the value that the service adds to their daily lives and also it simplifies the process around maintenance issues in their flat.



"The process is really neat. It is easy for me to navigate through."

Student, 27

", I really like the idea that you can borrow things, so you don't have to buy them if you need them only a few times."

", I think it is easy for the user but the most of the stuff happens in the background. What are the tasks for the supplier ...?"

Participants during the prototyping session, North London

Scenario Role Play

The user journeys from the prototyping session leads to think about other important touchpoints for the end user. With the help of a role play it was able to test the pickup and delivery scenario with tenants and suppliers. Issues around notification wording, timing and instructions for users came up and could be addressed.

The common messaging service *WhatsApp* were used as a communication tool between tenant and supplier. Existing products from the flat and a storage box were used to bring the scenario to life.



"I like the idea of a storage box. You do not have to be at home and wait for the delivery. In our neighbour hood it could work well but what if the situation is different?"

Student, 22

"Maybe there are options around pick up in kiosks and local shops or that you can choose a specific delivery time."

Student, 23

Role play situation, East London

Flat Share Agency

A testing session with service providers were conducted to test the overall service concept with help of the service blueprint and a mockup of the management platform. The participating agency already provides a full furnished flat share service but are lacking in a professional management of supply when it comes to maintenance and provision of products in their flats. The system could be implemented in their current existing system and would add a real value not only for the agency in terms of management efficiency but first and foremost for the tenants.



"We currently provide products to our tenants. We buy them from our suppliers or in some urgent cases at *Argos* - each month we have a huge amount of orders. But when something is broken we will simply throw it away."

Manager, 32

Participant during the testing session, East London

TLS Flat Share Management

"The system could really work – we have already the suppliers and storage facilities in place. The digital management of products could also fix the problem with our messy maintenance *WhatsApp* groups."

Manager, 32 TLS Flat Share Management



Student Housing

Another testing session was arranged with a manager of a student housing in South London.

The student housing facility provides housing for over 300 people under one roof. The testing session was conducted to figure out on which scale the service would work best and what kind of different scenarios have to be improved or iterated.

The result was, that the proposed service can be easier implemented on smaller scales. Most issues pop up around the lack of storage space and labour intensity of maintenance and management.

The overall feedback was nevertheless positive. The management team already experienced the issues, that tenants have to buy everything new when they move in and when they move out, most of the items end up in the bin. They liked the idea of a storage box to collect all leftovers from tenants, which can be provided to later tenants. This could be easily implemented and run as a pilot project at a small scale.

"Definitely helpful for the students. I totally agree with the issues they are facing."

"A digital form of managing the maintenance is definitely helpful and would save a lot of time. Today we use a book to keep track of all that. And it is also good because a lot of people are too lazy to speak to us or coming too late."

"People like me need a training for how the system works ..."

"I think for a landlord or agency who will maybe have 20-30 flats it will work. In our case with 300 people it could be difficult to keep track of all the items. I see some troubles related to the lack of storage space ..."

Facility Manager, 29 Student Housing

Benchmark Research



Mini Living Milan Design Week 2016

With this installation, MINI addresses one of the most pressing challenges in urban living which is the shortage of affordable housing. It is a shared-living concept which blurs the lines between private and communal in a flexible way. It opens up the conversation around the question of 'How might we live together in the future?' (Boruslawski, 2016)

2

4

The Collective Co-Living Old Oak

The Collective Old Oak is a full service co-living space in North-West London. Beside full furnished rooms tenants get access to additional services like a library, gym, restaurant, laundrette and spa. It is made specially for people who stay temporarily in London and its overall feeling is more like staying in a hotel than renting out a flat. (The Collective, 2017)



£5.40

p.m.

Thomas Rau × Bosch × Eigen Haard

Architect Thomas Rau (2015), together with Bosch and Eigen Haard, found out, that people in social housing buy cheap products to keep initial costs low, but don't think about the long term extra costs which they will cause. They developed a concept where people can lease high quality appliances from Bosch, which they could otherwise not afford. After usage, Bosch takes the products back to 'close the loop'.

Furniture Rental Service Furniture rental services like `roomservice-

bycort.com' or 'davidphilipps.com' provide furniture packages which can be rented on a monthly basis. The user can choose between single pieces or a full furnished offer. 'Roomservice by cort' (2017) also provide packages which are specially made for students which contains basics like a sofa, table, chairs, bed, bedside chest and chest of drawers.

Competitor Map

The benchmark research leads to a competitor map which situates the different projects with help of a matrix. It is divided in the spectrum of *Renting & Living* and *Add-On & Full Service*. The cases around co-living fit into the category *Living* and *Full Service*. These types of living experiences which are on one side completely 'hassle-free' for users, create on the other side a kind of 'hotel feeling'.

The form of co-living and flat sharing today occur out of the rising housing costs (Collinson, 2015) which is a contradiction to these places which are more positioned in the luxury sector and are often too expensive for students and people with a low income.

The other two services are situated in the fields of *Renting* and *Add-On* which means, that they are not bounded to a specific place and the user has to rent out the specific item itself.

The service scenario can be seen as a service layer which can be added to every property and existing services. Users do not get in contact with renting or leasing of products; they only rent out the flat and the leasing takes place between flat share agency/landlord and manufacturer.

USPs

The unique selling points of the proposed service scenario are in different fields around sustainability, user experience and implementation.

The service ensures a connection between user, supplier and manufacturer to provide a closed loop service. The leasing of products takes place on a B2B level which means, that manufacturers set up contracts with flat share agencies, customers with large quantities.

During the research around the library of things it was recognized, that these high volumes are crucial for manufacturers and companies in terms of profitability and feasibility.

The service is made for every kind of property and can be add-on to existing services, which made it easier to scale and makes use out of existing networks and systems.



Full Service

1 Directly connected with manufacturers to `close the loop'.

B2B leasing model which is hassle-free for users.

2

4

3 Add-on service, integrable to every property.

Permanently and temporarily lending.
Deliver

- 5.1 Service Concept
- 5.2 Service Process & Frameworks
- 5.3 Touchpoints

5.1 Service Concept

A sharing platform that contributes to a better co-living experience for temporary living in London, based on principles of a circular economy.

Overview

Flatbox is a sharing platform that can be implemented into all kind of rented properties. Especially made for flat sharing, *flatbox* is a service that provides products permanently or temporary to tenants. Flat share agencies and landlords lease products directly from manufacturers. With an app and digital management platform, products can be ordered by tenants and maintenance requested. Products circulate within storage boxes between tenants, suppliers and manufacturers to provide a 'closed loop' service.



User Journey: Today

User Journey: Tomorrow





1. Sign rental contract 2. M

Emily moves to London and
finds a cheap flat share.After she has moved in, she
recognises that basic things
are missing and existing
products are leftovers from
other tenants which are not
in good conditions.



 Emily needs for her stay a
 hair dryer, which she can not find in the flat. She for got to bring one from home
 but which also wouldn't
 have fitted in her luggage.



4. Search product

The easiest way for Emily to get a hair dryer is to buy it. She searches online for a cheap one which she can use during her stay.



5. Buy cheapest one

6 months later...

6. First use

Emily found a cheap hair After using the hair dryer dryer at Argos which is the first time, she was not close to her flat. She has really satisfied. The quality chosen the cheapest one is so low and actually not because she doesn't want what she is used to have to spend much money on back at home. She thinks, something that she will only that for the short period of use for a short time. time it is okay but when she will move, she will definitely get a better one.

7. Move out

At the end of her stay, she t has to move everything out of her room. No one of her flatmates wants the cheap hair dryer and it doesn't , fit into her luggage. She is annoyed and doesn't want he to keep this `crappy' thing

anymore.

8. End of life

She places the hair dryer together with other things she has bought over time next to the waste containers. She feels happy gotten rid of this burden.



1. Sign rental contract Emily moves to London and finds a flat share with the flatbox service. She likes that it is fully furnished and she can borrow products she will need during her stay.

2. App login3. Broken productAfter signing the contract,
she gains access to the flat-
box app where she can bor-
row items and also request
maintenance of existing
products.Emily recognises, that the
hair dryer doesn't work
properly anymore. Shee
knows from her estate
agent, that she easily car
request a replacement.

flatbu

0000



4. Request exchange

Emily recognises, that the hair dryer doesn't work properly anymore. She knows from her estate agent, that she easily can request a replacement. Within the app, she scans the code on the product and writes a short note about the issue. She requests the replacement, which will be delivered to her flat in a few days.



6. Delivery notification

The next day, she gets a notification that her item has been replaced and stored safely in the box.





7. Receive new product 8. Move out

Emily can now use the re-
placed hair dryer which she
has requested. She is happy
that the agency cares about
her and she does not have
to buy a new one.At th
Emily
place
requ
stora

At the end of her stay, Emily leaves the flat and places all the items she has requested over time in the storage box which will go back to the agency.

5. Place storage box

After her request was reviewed by the agency, Emily gets a notification which asks her to place the storage box with the broken hair dryer outside of the front door to receive the delivery tomorrow.

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User

"During my short stay in the flat share I got access to a lot of products which I would otherwise had to buy."

Emily (24) Student, living in East London

Gains	Pains	Values
Emily stays for her studies temporarily in London. She likes to explore new places. Flexibility is very impor- tant to her and she does not want to be bound on a specific place. She prefers flat sharing because of the social contacts and also the convenience of sharing. She also tries to get the same living standard like at home, even if it is not	Her low budget is a very big constraint in her current live situation. She is saving money everywhere she can. A cheap flat is priority number one for her stay. She moves only with her suitcases and therefore can not move a lot of things around. At the same time she is frustrated that she can not get the same life quality like at home.	Flexibility and convenience at the same time are very important for Emily. When she was searching for a flat, she likes to have an easy process when it comes to renting. She just want to live and do not want to care about things, like buying a hair dryer or toaster for her flat.

Service Provider

"A lot of the tenants prefer my properties because of the convenience which is added through the service."

Samir (45)

Estate Agent in East London

Gains

Pains

Samir likes his clients and he always wants to provide the best service he can. He cares about students and want to arrange the best possible living conditions for them. New ways to improve his business and also to make his properties more attractive on the market is a goal.

He is everyday very busy because his team is relatively small and he has to do a lot of work. Samir has to deal with what is already there and sometimes he feels like that he can not change the bad housing situation in London. The maintenance of his properties is a problem in terms of management and organizing.

Providing the best possible service for his tenants is his priority number one. He is also open for new services to optimize his business. The convenience what new technology offers for managing will safe him precious time. He is also a supporter of the idea of flat sharing and co-living and likes the fact that through this, that even young people can afford housing in central London.

Values

150 Deliver

possible at all time.

Relationship Map

The relationship map gives an overview about how different stakeholders are interlinked. Contracts for leasing products are taken place between flat share agencies and manufactures.

To get access to products, tenants pay an additional service fee to their monthly rent. The suppliers manage orders, returns and exchanges, and function as an interface between storage space and the user.

In the case of maintanance, the products get replaced and will be send back to the manufacturers for repairing, remanufacturing and recycling, to `close the loop'.



Benefits

The service benefits all involved stakeholders in different kind of ways. The end user gets access to a range of products without the need of spending money on products which will only be needed for a short time.

Landlords and flat share agencies are able to provide a better co-living experience and create a second income stream beside rents.

Manufacturers get their materials back for remanufacturing, reuse and recycling. The service is based on a B2B model, which ensures for manufacturers commercial customers with large quantities and high volumes.



Can request products which are needed permanently or temporary during the stay

- While getting access to a range of products, the service changes user
- behaviours to a more sustainable consumption
- Receive a full service and worry free maintenance
- Do not have to buy things which are needed only for a short time
- Enables user to live in central and existing properties with a 'high' living standard



Service Provider

Provide users a better co-living experience

- Second income stream beside normal rents
- er Make properties more attractive for users
 Save money and time in terms of
- ee maintenance - Better property management
- Empowers service provider to set up their own system
- Empowers service provider to run a more sustainable business
- B2B business model with large quantities and high volume
 Get old materials back for manufacturing new products
- Constant cash flow with a leasing business model
- Enables a closed loop supplyGet in touch and build relationship

Manufacturer

- Get in touch and buil to future customers
 - Create brand loyalty

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Service Process & Frameworks

Frameworks

Following frameworks were chosen to explain how the service works along the user journey for all involved stakeholders. The value proposition canvas and lean canvas will give an overview about how the business model works and what value it adds to all different kind of stakeholders.

To see how the service works not only for the end user but also the service provider and all involved stakeholders, different maps will show how the process works along the user journey.



Service Blueprint

The service blueprint gives a detailed overview about the process of how the service works along the journey. Needed actions for both user and service provider are explained and interlinked to create a seamless user experience.



Service Wheel

The service wheel shows how the system works in all three different stages pre, during and post service, to create a seamless experience.



Value Proposition Canvas

The value proposition canvaes gives an overview about customers needs and the provided services and products.



The business model canvas by Alexander Osterwalder (et.al. 2014) shows how the business model behind the service works and gives insights into revenue streams and cost structure.

Service Blueprint





Value Proposition Canvas



Products & Services

- Leased products from manufacturers which include household products, appliances, tools, furniture and special mixed theme boxes
- Maintenance and delivery service
- Management platform and app

Gain Creators

- Permanent and temporary borrowing of products during stay in flat share
- Worry free maintenance service
- Second income stream for service provider
- Closed loop supply chain for manufacturers

Pain Relievers

- Tenants safe money and time because they do not have to buy products for their temporary stay
- Flat share agencies and landlords can manage the maintenance of products in a more efficient way
- Manufacturer get materials back and reduce their waste streams

Customer Segment

Gains

- Tenants do not want to spend money on products they use only a few times
- Tenants want a `high' living standard for their temporary stay
- Flat share agencies and landlords want to provide a better co-living experience
- Manufacturer want to lease a high amount of products and need the materials back

Customer Jobs

- Tenants have to search and buy products
- Flat share agencies have to furnish and maintaine their flats to make them more attractive for short term renters
- Manufacturer want to provide products and need a customers with large quantities

Pains

- Tenants spend money on products they only use a few times
- People rent out cheap flats with low quality, no products at all and poor maintenance
- Products end up in the landfill and materials are lost
- Every purchase of the tenants lowers their flexibility

Business Model Canvas

Key Partnerships	Key Activities	Value Proposition	Customer Relationships	Customer Segments
Flat Share Agencies Landlords Manufacturers	Short and long term borrowing Supply and maintenance of products Management of stock	Create a better co-living experience	Leasing contract between manufac- turer and flat share agency/landlord Renting contract between tenant and flat share agency/landlord Working contract between flat share agency/landlord and supplier Leasing contract between flat share agency/landlord and <i>flatbox</i>	Renters with the need for short term rental (e.g. students, professionals etc.) Flat share agencies Landlords Student housing Manufacturers
	Key Resources [1] Mobile app		Channels A	
	Desktop management platform Storage boxes		Desktop management platform Storage boxes Storage facility Cargo bikes	
Cost Structure		C Revenue Stream	ns	

Cost Structure

Flatbox:
App and desktop platform maintenance
Storage boxes
Marketing
Staff

Service Provider: Storage facility Staff (supplier, management) Monthly service fee Product leasing fee

Revenue Streams

flatbox:

Flat share agencies and landlords pay a monthly service fee for using the digital management platform and the app for the users.

Service Provider:

Flat share agencies and landlords get a monthly service fee from the tenants which they pay on top of their rental contract.

Manufacturer:

Manufacturers lease their products for a monthly leasing fee to the flat share agency or landlord.

5.3 Touchpoints

Main Touchpoints



The identified touchpoints along the user journey will carry out the service and ensure a seamless user experience.





The App

A digital app will be the main touchpoint for the user to operate the service. Within the app, user can manage everything around orders, replacements and returns of products. It allows a seamless and efficient communication between user, service provider and supplier.

The Storage Box

Storage boxes will be used for the delivery and replacement of products. The box will be made available in each flat. During their stay, tenants can use the box to receive orders and return products, even if they are not at home.

The Products

Each product will be labeled with a barcode. This makes it easier for stock management and delivery. To keep the maintenance and remanufacturing simple and efficient, products have to be designed for disassembling.

The Management Platform

The digital desktop management platform allows service providers to manage the service efficiently. It gives an overview about requests, orders, flats and stock. The system allows a seamless communication between user, service provider, supplier and manufacturer.



The Supplier App

Connected to the desktop platform, the app for suppliers enables the delivery of products. It is designed for suppliers to keep track on their daily tasks and ensures the communication between service provider and supplier.

Ecosystem

Beside the main touchpoints, there are secondary touchpoints for an efficient and seamless service provision. The ecosystem consists of cargo bikes, storage and logistic system, digital and physical marketing materials.



The App

Connecting users with service providers

The mobile app is the main interface between users and service providers. Users get an overview about all the products which are in their flat and available for borrowing on a temporary or permanent basis. Maintenance can be requested and with help of push notifications, user can keep track on the status of their orders. An overview on the home screen of permanently available products in the flat and temporary borrowed items, the app will give the user a simple and fast access to key information and `call-to-actions'.







Flowchart



Screens



User can sign in and register or log in,

when they already have confirmed their

user account.

Sign in To create an account, users have to enter a personal code, which will be sent by email from the flat share agency. It is nessesary that the service provider has created an account for their customers, which will be activated by the tenants in the app.



Onboarding I When the user has signed up, a short introduction will show, how the service works and what kind of opportunities the user has.

4



Onboarding II







(5)

Home screen The home screen gives the user an overview about temporary borrowed items and permanent available products in the flat. 6



Search User can search for available products by categories, text input or by scanning a barcode which is on each product. (7)

8



Activity

The activity list gives the user an overview about active requests. All push notifications will be shown in a time line related to each product. 'Call-to-Actions' like support, messaging or canceling will be shown when available.





-(1)

. **** Carrier T 1:20 PM \$ 100% Q Product or Categorie Q2 Bathroom (6) > Hair Dryer, Bin, Accessory, Rand Shower Kitchen (12) 18 > Cutiery, Knifes, Plates, Glasses, Pans, Pots ... Large Appliances (5) 0 > Kettle, Washing mach Microwave, Toaster Tools (6) Boycle Touls, Screwdriver, Ledder (350 Furniture (9) 漱 > Bed, Closet, Lamp, Millior ... Theme Boxes (3) -> Sport, Picknick, Camping, Party ... 1 8 O,

(6)

Search User can search for available products by categories, text input or by scanning the barcode which is on each product. 9



Search by category In each category, products are listed and labeled if they are available on a permanent or temporary basis. (10)



Product overview

Each product has an overview with picture,

name, category, availability, user rating, sta-

tus, description, time line and a main request

`call-to-action'.

(11)



Product timeline Each product has a activity time line, which gives the user insights about current status, history and `call-to-actions' like support, cancelling or messaging. -(18)



Temporary item, request Some items like tools or theme boxes can be borrowed by the user for a temporary time. The user will be informed on the product page about availability and maximum borrowing time. Call-to-actions can vary depending on the current product status.

(13)



Select time span The user can select a time span which does not exceed the maximum borrowing time. Slots which are unavailable will be not selectable and are grey out.



(15)



To check the request, the user get an overview about the borrowing time and the expected delivery date. By requesting, the user agrees the terms & conditions of flatbox.

1 Your order has

1:20 PM

-(5)

\$ 100%

Confirmation The user gets a direct feedback if the request was successful and will be redirected to the

home screen where the product will be shown in the 'Temporary' section.



Permanent item, request Products, which are already in the flat and needed on a permanent basis can be replaced if maintenance is needed or be returned if not wanted or needed anymore.





Description The user has to select the reason for the exchange and send a short description which can be complemented with a photo or video. The text is limited to 50 words, which ensures a focused and precise description for the service provider who has to review the request to facilitate further steps. (14)

(15)

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Review request To check the request, the user get an overview about the review time and the expected delivery date. By requesting, the user agrees the terms & conditions of *flatbox*. •••• Carrier ♥ 1:20 PM \$ 100% Vour order has been placed.

Confirmation The user gets a direct feedback if the request was successful and will be redirected to the home screen where the status of the product

will be shown in the 'Permanent' section.

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-(5)



Activity The activity list gives the user an overview about ongoing requests. All push notifications will be shown in a time line related to each product. Call-to-Actions like support, messaging or cancelling will be shown when available.

(18)



How it works: Step I The user gets an introduction about how the process of a delivery works. It will also show details about address and the expected delivery date.

(18)

×

(18)



How it works: Step II

How it works: Step III



The Storage Box

Exchange of products between user and service provider

The storage boxes will be available in each flat. Tenants can place the box in front of their door to receive orders, exchange products for maintenance or return borrowed items. If it is not possible to leave the box outside the door, tenants can bring the box to a near by collection point (e.g. a kiosk or local business). At the end of their stay, tenants can leave all their borrowed items in the box which will be picked up by the service provider and get returned to the storage facility. The storage boxes will be also used by suppliers for delivery and storage of products. The system does not require additional packaging and allows short distance deliveries.



Box Design

The box is covered in black to not cause attention of strangers while placed outside the front door. It is labeled with the *flatbox* logo and a address card. This card can be created for each flat in the management platform by the service provider. It shows the address, agency logo and a data matrix code. The address is necessary for suppliers if several boxes are stored at a collection point. The code will be used at the end of each delivery by the suppliers to fulfil the delivery which is at the same time also a verification for the manager.





Attached Lid Container 'Euro Container' produced by BiGDUG Lt from eco recycled plastic (BigDug, 2017)



ay of storage bo

Product Code

Each product will be labeled with a data matrix code and an iD number. The code will be used for stock management and maintenance. It can also be scanned by the tenant within the app to request maintenance or returns. At the same time it is a signage to the user, that this item belongs to the flat and is part of the sharing service.



Graphic: Inspired by Muji (2017) Pop-Up Toaster

Product Design

To reach the aim of a regenerative economy where old products become the material input for new ones, for the proposed service concept products have to be designed with sharing in mind, to create an efficient reverse cycle. Design for disassembly, maintenance, remanufacturing, reuse and recycling were identified as important parameters for products. (Poppelaars, 2014) The Agency Of Design (2017) created several design concepts, inter alia, a modular toaster where each module can be send back to the manufacturer for repair and remanufacturing.



The Products

Temporary and permanent provided items

Tenants will get access to a range of products which will be leased by flat share agencies or landlords directly from manufacturers. During the research and in collaboration with a flat share agency in East London, products of following categories were needed: bathroom, kitchen, large appliances, tools, furniture and theme boxes. In each category, basic products will be provided to tenants, which can be used permanently during the whole stay or temporarily for a short time like tools or theme boxes. Theme boxes will cover a range of products around topics like sport, pick nick or camping and can be borrowed from tenants as a total package for a definite period of time.



Involved stakeholders





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The Management Platform

Desktop management tool for service provider

The digital desktop management platform allows service providers to manage the service efficiently. It gives an overview about requests, orders, stock and flats. Connected with the app, the system allows a seamless communication between user, service provider, supplier and manufacturer.

All requested items and the history of all orders can be reviewed and the impact be measured. Accounts for new tenants can be created, assigned to flats, managed and individual lables for boxes can be printed. The system helps to create an easy and efficient way of managing maintenance requests, which was experienced during the research is today mostly done analogue.

Involved stakeholders



Service Provider



Dashboard The supply dashboard is made for managing incoming user requests, stock and supply chain. User requests can be reviewed and responded.



The Supplier App

Connecting supplier and service provider

With the app, the delivery of products will be made easy for suppliers. It is connected with the management platform and provides information about current orders and activities. The supplier gets information about receiver and address, type of request (order, exchange or return), ordering number and product. After picking up the items in the storage facility, an map will be showed for navigating to the delivery address.

If the product is stored safely in the storage box of the tenants, the supplier scans the code of the box to complete the delivery/pick-up. If he can not fulfill the task (e.g. missing box, wrong address) the supplier can get support from the management team.

Involved stakeholders



Service Provider



Request, overview The request screen gives an overview about current orders with information of address, receiver, type and product.



Request, detail Each request will show details about the exact delivery address, receiver, type of order and product. In the case that the supplier can not fulfill the task, he can get support from the management team.



The Ecosystem

Touchpoints for pre- and post-service provision

Previous main touchpoints will be mostly used by the user and service provider during the service. For pre- and post-service stages, additional touchpoints were needed to onboard user.

Service provider will get in contact with the flatbox service through marketing and the website where properties can be registered. During the testing the need for workshops and trainings came up, which will help onboard operating staff members to the service and tools.









Pre- and Post-Service Touchpoints

Contract

The tenants will get first in contact with the *flatbox* service when they are searching for accommodations or when they are signing the rental contract. The service provider will explain how the service works and will set up their user accounts. Tenants can download the app and enter their personal code to complete the registration.

Logistic and Storage

A logistic and storage system has to be set up by the service provider to organize and manage the stock. Storage boxes will be provided by *flatbox*, which can be send back or exchanged if needed.

Marketing Material

Marketing material will be used to get in contact with potential service provider and future user. It will explain how the service works and what impact is has on social, corporate and environmental aspects.

Cargo Bike

To reduce CO_2 emissions, supplier are advised to use cargo bikes for delivery. Often the service provider are situated in the area next to the provided flats, where the delivery can easily done by bike.

Training, Workshops & Customer Service

Trainings and Workshops are needed to implement the service and train frontline staff. It can be done in person to person or with online tutorials and videos to help & support the service providers.



Website

The website will carry out brand content and will be the touchpoint for service providers to register their properties and pay the monthly service fee. After registration they will get access to the management platform and are able to order storage boxes.



Name + Logo

A unique name and bold logo help to communicate the service idea to a broad audience. Icons were designed based on the main logo to create a consistent look.







flatbux

The Brand

Clear communication of the service concept

To communicate the service clearly to a broad audience, a strong brand is needed. The name *flatbox* was chosen to put the storage box in the centre of the service which will function as a metaphor, to create a clear picture of what the service is about.

Two advertising posters were created to communicate the main idea of the service. This helped to focus on the essence and strengthen how the service concept works.

Involved stakeholders





No need to worry. Just put it in the box

flatbux



Borrow stuff you need during your stay. flatbux latbox.co.uk Google Play

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Discussion

Methods and Evaluation

The research of the present project followed a human centred design methodology with a specific focus on the end user, which was needed to gain insights not only into the consumption behaviour of people but also of the wider context, to identify the trigger of the behaviour. The open design process has allowed to shift between different fields and reveal the roots of how they are interlinked, to be able to propose a solution that fits the user needs which also addresses global challenges (World Economic Forum, 2016). For an overall successful implementation of a circular economy, the model can only be reached by a behaviour shift and the support of consumers. (Czech, 2017)

Different research methods from the ethnographic field like observations, co-discovery activities and interviews started in the broad field of consumption. With the gained insights, the focus of the problem space shifted during the process until the drivers behind the problem were identified.

The temporary living situation of the user group were identified as one of the main trigger of the consumption behaviour. From this point on, it was possible to narrow down the research question to be able to create a solution for a more specific problem.

Related to the broad and open approach, the project shifted to the topic around co-living which has open up further research opportunities.

Related to the complexity of a circular economy and its influencing factors on every kind of industry, the service concept addresses only a very small and specific field and should be seen as an inspiration of how services with a circular economy business model could work for the end user on a daily basis.

The proposed service concept focuses on the re-use and service-life extension of products which is identified as one of "the most profitable and resource efficient business models of the circular economy." (Stahel, 2012)

The shift to a circular economy can be overwhelming because of its system wide changes. Challenges around policies, business models, product design and profitability pop up, which already started several discuss about its feasibility. (Stahel, 2012; see also European Commission, 2015; World Economic Forum, 2016; Ellen MacArthur Foundation, 2013)

Due to the limited scope of the graduation project, not every detail of the concept could be addressed. The project can be seen as a starting point for further iterations and ispiration of opportunities.

On the following pages, the social and environmental impact as well as the scalability of the service concept will be demonstrated.

The open and non-linear research process allowed shifting between different interlinked fields which leads to a project outcome that addresses user needs and global challenges.

Impact

Related to the insight that sustainability alone can not lead to a needed behaviour change, the proposed service concept addresses user needs around an increase in flexibility and convenience of urban living, whereas sustainability can be seen as a driver for involved service providers and manufacturers.



Better Co-Living Experience

The service contributes to a better co-living experience for tenants which is rooted in more flexibility and convenience. Instead of buying new, borrowing products will save the user time and money. Through the access of several products and its maintenance, a higher living standard can be reached.



New Income Stream & Improved Loyalty

A new income stream for service providers contributes to a growth of their businesses. The service improves customer loyalty and creates market advantages towards competitors.

A more convenient way of managing stock and maintenance might also lead to a better employee satisfaction and increase in efficiency.



Circular & Sustainable

The re-use of products increases their lifetimes, reduces waste and keeps their value at its highest level. The service can be implemented in functioning and existing systems. It enables products to circulate in closed loops, which is profitable and resource efficient.



Scalability

The proposed service concept assumes several requirements and relationships between stakeholders. To built these from scratch, it takes time and an upfront investment is needed. To simplify the implementation, the service can be brought down in four different scales, starting with a minimal viable product used for pilot projects.





MVP

Informal sharing system

The minimal viable product can be implemented today, without upfront investment.

Flatbox will provide flat share agencies and landlords storages boxes for each of their properties, which tenants can use to put their unwanted products in, before moving out.

Instead of throwing already purchased products away, the system encourages tenants to share their items. The storage boxes can be picked up by the agency and the products can contribute to the network of flats. They can be distributed to other flats, where the products are needed. If the products are broken or can not be used, the agency will ensure a correct recycling.

The service might lead to extend product life times, enables re-use and ensures recycling.

Managed sharing system

The second scale will make use from already existing products which are left overs from tenants or bought by the flat share agency. These products can circulate within the *flatbox* storage boxes between all managed flats.

Already existing messaging services like WhatsApp can be used as a communication tool between tenants and service provider to borrow items or request maintenance. This model would extend the use time of products but would not close the loop for repair or remanufacturing by manufacturers.

The service can be implemented as a pilot project for flat share agencies who already provide full furnished flats.



Proposed Concept

Integrated 'closed loop' service

The proposed service concept provides a digital management system. To run the service it requires storage facilities, suppliers and manufacturers who offer products on a leasing basis.

It will enable flat share agencies and landlords to set up their own system which at the same time needs to be managed and supplied by themselves.

The service will enable the provision of products to tenants and leads to a more efficient way of managing the maintenance of products. In return it will also add more responsibility and workload to the service provider.

A monthly service fee will be cover the additional costs for the service provider and creates a second income stream.

Outsourced 'closed loop' full service

All stages afford an involvement of the flat share agency or landlord in the service provision process, which requires labour force and adds workload.

Agencies which provide full furnished accommodations have already necessary resources in place or can them integrate into their existing system. However at this scale, the service would be completely managed by *flatbox*.

Flatbox would offer flat share agencies and landlords a full service solution which includes the supply and management of products.

Leasing contracts of products would be set up between manufacturers and *flatbox*.

This scale would be a 'worry free' service not only for tenants but also for flat share agencies and landlords.

203 Conclusion

The shift to a circular economy can be overwhelming. To carry out a needed behaviour change, models have to be redesigned around consumers and existing systems.

Conclusion

We have to see products as a part of a system

The shift to a circular economy can be overwhelming. Conducted research around consumption, questions how might the relationship between consumer, product and retailer might change within a circular economy. To carry out a needed behaviour change of consumers, it was necessary to reveal the roots of consumption. Traced back to changing needs and values of Millennials and their temporary living conditions, traditional linear consumption patterns with the mindset of ownership are inefficient and wasteful. The research reveals, that co-living and flat sharing can be seen as systems, where products are part of. With principles of a circular economy, these existing and functioning systems can be used for integrating products to not only `close the loop' but also lead to a better co-living experience.

Seeing products as a part of a system ('products-as-a-service') and focusing on systems solutions will be the most profitable and resource efficient way for a circular economy business model. (Stahel, 2012) It was also identified, that the value of sustainability alone will not lead to a behaviour change of the consumer. It was therefore crucial, that the proposed service concept focuses also on values like flexibility and convenience to meet the needs of the users.

The service solution should be seen as a small part of a bigger picture, following the paradigm of "Think globally, act locally." (Geddes, 1915) It pictures, how a circular economy might work for the end user on a daily basis. During the research it was also identified, that the proposed sharing concept alone will not enable the shift to a regenerative economy. The products have to be designed with its shared use in mind, which requires, that they are made for reuse, remanufacturing and recycling. This will be one of the major challenges for manufacturers, beside other issues around policies and profitability (European Commission, 2015; see also World Economic Forum, 2016; Ellen MacArthur Foundation, 2013) to a more sustainable way of doing business.

"The next big opportunity is bringing the consumer in. Without consumers, the circular economy can't work: We need people not only to buy, but to bring back."

Rebecca Early (2016)

To overcome global challenges (World Economic Forum, 2016) it will be inevitable to rethink the way our economy functions today. Systems have to be designed around people – not products. Therefore, the shift to a circular economy might only happen if we redesign the system by following a human centric approach.

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Major Project

M.A. Service Experience Design & Innovation

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