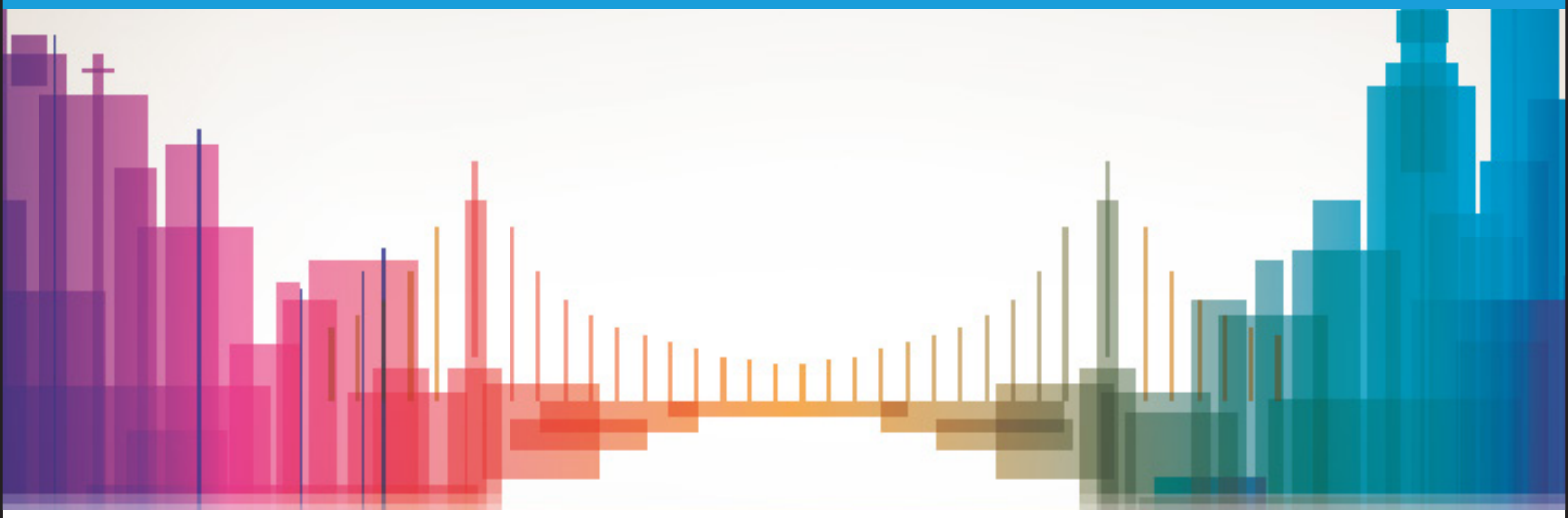
United 4 Smart Sustainable Cities

Re-use of consumer goods and tools loaning

Case study of the U4SSC A guide to circular cities

June 2020



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United Nations ECLAC

Food and Agriculture Organization of the United Nations

ITU

UNDP Empowered lives. Resilient nations.

United Nations Economic Commission for Africa

UNECE

UNESCO United Nations Educational, Scientific and Cultural Organization

UN environment United Nations Environment Programme

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TORONTO

United 4 Smart Sustainable Cities

Case study: Re-use of consumer goods and tools loaning

June 2020

Foreword

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ZERO
WASTE

Case Study 1 – Toronto Tool Library and Sharing Depot

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Reviewer and editor:

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Introduction

Background

Toronto is Canada's largest and most multicultural city. Beyond its diversity, Toronto is also home to one of the largest library systems, with over 100 public library branches. These libraries provide a wide range of services, including the loaning of books, magazines, CDs and DVDs, in addition to free internet, skill-building workshops, public meeting spaces and much more.

Challenge and response

Toronto, like any city in the world, faces the challenge of living within the natural limits of the environment. Economic growth will inevitably collide with the finite natural resources on our planet, and infinite consumption growth based on a finite amount of resources is simply unsustainable. In addition to a growing carbon footprint, income inequality is also a rising concern in Toronto as in most areas of the world. Ensuring that Toronto remains an affordable city is a challenge that needs to be addressed in all areas, from housing and food to access to goods and services, which ensures that the city can sustain its cherished quality of life.

In this regard, in 2013 a small group of passionate individuals launched a project that addressed income inequality and environmental concern. The project was called the Toronto Tool Library and was modelled after the successful Berkeley Tool Library launched in the 1970s in California. The idea was to make a programme that was affordable and took on the problem of consumption by giving people access to a wide range of goods and tools that are typically used only a few times a year. Through an annual membership scheme, the public could access thousands of items instead of buying and storing these items themselves.

In 2016, the Tool Library expanded to include the Sharing Depot, a library for items beyond tools with a focus on children's toys, camping gear, party supplies, sports equipment and board games. Members of the public can purchase membership to either the Tool Library or the Sharing Depot, or get combined access with an upgraded membership.

Promoting circularity

Vision and content

The Toronto Tool Library and Sharing Depot started with the assumption that there are already enough resources available to meet the demand of communities, not only in Toronto but also globally. This statement can broadly apply to food (approximately a third of the world's food production is thrown away), energy and virtually all consumer and industrial goods if they were designed and used in an environmentally responsible manner.

The Tool Library's goal was to provide homeowners, renovators, artists, artisans, community groups and small businesses with the physical tools required to take on their projects. Rather than buying a full set of tools, which can take up a lot of space in a home and cost thousands of dollars, the Tool Library offers an affordable option for clients/members to borrow the tools they need instead of buying them.

The project was launched in 2013 (see below for further details about implementation) and since then has grown to acquire more than 15 000 borrowable items across three locations in different neighbourhoods in the city. Over 99 per cent of the available items were donated by the public (virtually no items came from corporate sponsorship) and a small number of tools were purchased with government grant funds. Later the same year, a makerspace was launched where members can use the tools onsite to complete projects rather than transporting them back and forth to the library. Both programmes, the library and makerspace, generate revenue for the organization and the makerspace also hosts workshops to teach woodworking, electronics and other skills.

Results

Overall, the Toronto Tool Library and Sharing Depot is satisfied with the results of the project at this stage. The project has created a great brand and is recognized amongst the city inhabitants for being an innovative programme that is inclusive and reduces waste. Since launching in 2013, more than 80 000 items have been loaned and this has generated over USD 750 000 in revenues. Each borrowed item had been donated earlier and did not, therefore, end up in a landfill. In addition, the item was not purchased by the user, so generating less waste down the line. Some of the tools have been borrowed over 100 times each, resulting in several million dollars of saving for communities over the lifetime of the project.

At the same time, the Toronto Tool Library and Sharing Depot has stayed true to its values of maximising the lifespan of their resources and supplying this abundance to people. The membership prices are less than the cost of even one of the items (memberships start at USD 55/year while the cost of a power drill can easily exceed USD 100) and Pay-What-You-Can memberships are offered to those who cannot afford the modest fees. Each week, a Free Community Night is hosted at the makerspace where people with all skill levels can learn to use tools under the guidance of expert woodworkers and artisans. This programme did not exist before the project, and the Toronto Tool Library and Sharing Depot is proud to have hosted thousands of people at the Tool Library through this programme alone.

In 2014, the Toronto Tool Library and Sharing Depot was awarded the Live Green Toronto Award as the 'Greenest Group'.

An additional unforeseen benefit has been the significant media coverage garnered since launching the programme. Before opening the doors of the first location, the media found out about the project and newspapers and radio shows began spreading the word about the programme. Over the years, it had over 100 media spots promoting the programme and encouraging other groups around the world to launch their own libraries. There are now well over a hundred libraries similar to Toronto Tool Library and Sharing Depot in the world and in 2017, it hosted a Lending Library Symposium to share best practices with other groups and groups aspiring to make a similar impact.

The social impact includes people's satisfaction and happiness about the programme, which contributes to community spirit and brings people together and allows for the exchange of knowledge and the building of skills.

The economic impact includes an increased disposable income for inhabitants due to reduced expenditures for tools. Other benefits are the avoidance of unnecessary consumption and production due to infrequently used items, and the standardization of tool-related expenditures through a fixed and fair price that is the same for all members who can afford it. It also enables increased disposable income to be diverted to uses that are better for the City's inhabitants.

The environmental impact includes reduced consumption and related production and packaging, which leads to decreased GHG (Green House Gas) emissions; it also reduces waste in the city through sharing and repairing goods.

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Case Study 2 – London: The Library of Things

Author:

- Tony Lee Luen Len

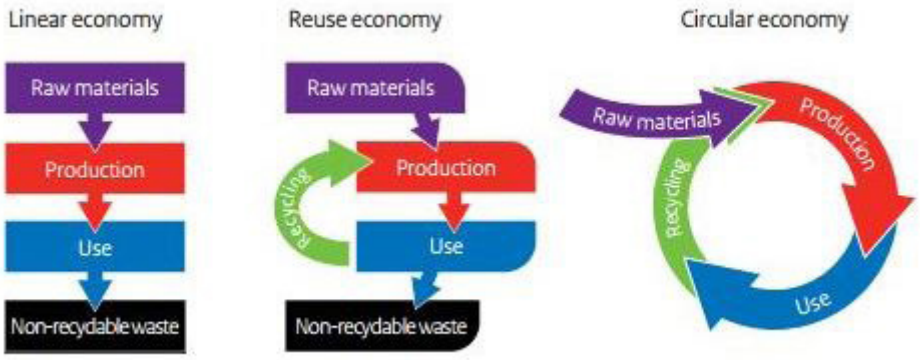
Introduction

Background

London is currently transitioning into one of the world's most resource-efficient cities, with the Mayor of London's pledge to attain a 65 per cent recycling rate by 2030 and to be a zero-carbon city by 2050 (Ogleby, 2017). With the launch of a route map by the London Waste and Recycling Board (LWARB), more than 100 practical actions on the re-using, remanufacture and redistribution of materials have been made available to the city's stakeholders, in order to help them and the city become more resource resilient. Moreover, this comes with a promise of new job creations in five areas of focus, namely textiles, electrical, packaging, the built environment and the food industry (Greater London Authority, 2018).

These measures stem from the city's need to shift to a circular economy, a more holistic alternative to the current linear economy, mimicking the natural ecosystems in order to help decouple economic growth from harmful environmental impacts (Ellen MacArthur Foundation, 2015).

Figure 1: Illustration of different types of economy (Ministry of the Environment, 2016)



London's current waste situation is quite alarming. The local authorities are collecting about 3.7 million tons of waste, which corresponds to 1 500 Olympic-size swimming pools filled to full capacity, while the recycling rates have gone back down to 2010 levels (Cole, 2017). With London's population expected to grow to around 10 to 13 million people over the next 30 years, an additional 1 million tons of waste per year will have to be collected so contributing greatly to the major threats posed by climate change and the rapid depletion of the world's resources.

In order to decrease the amount of waste produced and limit the effects of climate change, there should be a change in consumer spending habits given that around 60- 80 per cent of the environmental impacts on the planet originate from household consumption. According to a new study published in the *Journal of Industrial Ecology*, it was found that population's senseless consumerism contributes 60 per cent of global greenhouse gas emissions, with a total land, material and water use of 50- 80 per cent (Jacobs, 2016). This can be exemplified by the fact that people prefer to buy new items rather than repairing old ones.

This habit is fuelled by companies' profit-making strategies whereby products are made less sturdy in order to having shorter life cycles, as testified by their short warranties. Moreover, in many cases, people find the cost of repair to be higher than the cost of buying a new one. For example, as reported by HomeAdvisor, the repair services for major appliances can charge between USD 100 to USD 250 an hour for labour, excluding the price of spare parts and other service fees and taxes. For smaller appliances such as microwave ovens, the service charge can be around USD 70 an hour, with the addition of the cost of parts. However, most decent models can be purchased for prices ranging from USD 50 to USD 100 (Rox, 2018). Even though it may sound profitable for the consumer, and give an illusion of convenience, over the long term, the amount of money spent on a particular item is far higher as the frequency of replacement and/or repair increases.

Challenge and response

The main external city trends that have influenced the Library of Things are:

- **Degradation of the natural environment and economic losses**

  The economy as it is relies mainly upon inexpensive and readily available natural resources. However, as economic growth increases, natural resources decrease drastically while carbon emissions and the costs of production tend to be on the high side.

- **Regulatory trends**

  More and more policymakers around the world are charging the cost of externalities through environmental taxes. For example, the number of laws on climate change has increased by 66 per cent since 2009, rising from 300 to 500 laws (LWARB, 2015).

- **The change in consumer behaviour**

  As people's mind-sets change, companies are forced to follow, in order to remain competitive. For example, signs of a circular economy can already be seen in London, with people consuming goods in alternative ways such as carpooling, reading e-books rather than hard copies, leasing instead of owning, cloud computing or shopping from flea markets and second-hand stores (Greater London Authority, 2018).

- **The growing movement of the collaborative economy**

  The collaborative economy is growing rapidly. Gross revenue in the EU from collaborative platforms and providers was estimated to be EUR 28 billion in 2015. Growth in recent years has been spectacular, with revenues almost doubling from 2014 to 2015. In 2016, a Eurobarometer poll showed that more than half of all EU citizens know about the collaborative economy, with one

person in six already a user. Almost one third of people who have been on collaborative platforms have already provided a service at least once. That's more than five per cent of the EU population already providing products and services through such platforms. The collaborative economy is sowing the seeds of growth (European Commission, 2016).

The collaborative economy, also known as the sharing economy, includes a new and improved concept of flea markets and second-hand stores, where borrowing is encouraged over buying.

Originating in the United States, the Library of Things concept has been adopted in other countries: examples include the Sharing Depot in Toronto, Canada and Leila in Berlin, Germany. These have consequently inspired cash-strapped university friends, Rebecca Trevalyan, James Tattersfield and Emma Shaw, who were anxious to establish a sharing economy in their local community, to open up a Library of Things at the Upper Norwood Library Hub in Crystal Palace, South London (Library of Things, 2015).

- **Awareness campaigns**

  Initiatives such as the Transition Network, a community-led movement joining together to re-imagine and re-create the world in a more sustainable way, create, deliver and help implement sustainable programmes while connecting the local community. For example, the Crystal Palace Transition Town is helping the local community to reclaim the economy, to spark entrepreneurship and to re-skill themselves by weaving webs of connection and support (Transition Network, 2016).

In response to the trends listed above, the proposed solutions through the Library of Things project are the following:

- **Introducing the borrowing mind-set**

  The Library of Things has an extensive catalogue of carefully selected items in perfect condition that the members can borrow for a small fee, mostly ranging from GBP 1 per day for hand tools and GBP 5 per day for a bread machine to GBP 20 per day for a carpet cleaner, with discounts available for regular borrowers and people who are less able to pay (Purdy, 2018).

- **Competitive prices and quick service**

  To take one example, when people need to borrow a carpet cleaner for an event, they may have several choices: buy a carpet cleaning machine (around GBP 130 upwards); pay for a professional cleaning company (about GBP 40); rent a machine from a private hire firm (around GBP 29 for two days); or borrow one from the Library one for GBP 9 (Balch, 2016). The Library of Things makes a variety of products accessible to everyone.

- **Reducing waste**

  To avoid people dumping almost-new items that have the potential to be refurbished, the Library of Things put at the disposal of the community a space where the locals can bring their broken items, which are then given a second life through the 'repair café'. Furthermore, the repair café offers skill-sharing classes where volunteers share their mending and repairing knowledge to enable people to learn how to repair broken things in their household.

- **Training**

  The Library of Things also provides technical training when an item is borrowed. As illustrated by the co-founder Rebecca Trevalyan, 'If you haven't used tools before then it can boost your confidence in having someone to ask questions from and demonstrate how you use it. You don't get that with Amazon!' By doing so, the library is also performing a social function by saving people money they would otherwise spend on a handyman. The sense of achievement people feel once they've learned how to do something themselves is palpable, Trevalyan said, describing a lady who had never used a drill before as 'beaming' when she returned it, having put her curtain rail up by herself (Early, 2017).

- **Reinforced sense of community for a greater impact**

  As said by Emma Shaw, 'the Library of Things isn't just about things – the ultimate goal is connecting people to each other'. Besides borrowing items, people can attend practical events such as DIY classes or mending meet-ups, where skills are shared and acquired, and the communal spirit is strengthened (Lambeth Life, 2018).

Promoting circularity

Vision and content

The vision of the Crystal Palace Library of Things is to reduce consumerism by changing people's mind-set and behaviour on waste reduction and prevention whilst, reinforcing the sense of community through a circular economy. The latter offers a sustainable alternative to the current linear economy, which is considered to be incredibly wasteful as it relies on the use and disposal of virgin resources. On the other hand, a circular economy is one where resources are kept in use for as long as possible, in order to extract the highest value from them by designing for re-use, remanufacturing and recycling. This sharing economy is one of the most direct ways to cut down consumption and move towards a zero-waste economy, thus sparing the planet the impacts of yet another fondue set, which will inevitably end up in a landfill after years of gathering dust at the back of a cupboard (Vasil, 2016). This project is in alignment with the Circular London programme endorsed by the Mayor of London, which envisioned that by 2050, sharing, leasing, remanufacturing and re-using products will be the norm in London. Consequently, it is predicted that London could achieve a benefit of at least GBP 7 billion per year by 2036 and according to the WRAP's analysis, the city has the potential to create over 12 000 job opportunities in the circular economy sectors by 2030 (London Waste and Recycling Board, 2015).

Furthermore, the Crystal Palace Library of Things was backed by the Transition Town movement to set up camp at the Upper Norwood Library Hub, as this project integrates the Transition Town movement's vision to reduce the community's carbon footprint in a sustainable manner while creating a strong sense of community.

The key features of the Library of Things include the items available to the borrowers. These items, as opposed to other existing models of sharing platforms, are sourced primarily from companies' sponsorships thus enabling the Library of Things to provide higher-quality products than organizations proposing donated second-hand items. The items acquired through this system are catalogued on a

wish list created according to the local community's requirements and preferences, which includes, but is not restricted to, tools, home appliances, board games and sports equipment.

One of their other main characteristics was the desire to enable the clients to enjoy an 'Apple Store-like' experience at the Library of Things, whilst making it as practical as Argos (a British catalogue retailer). The place was designed in this light, and in addition a lot of thought was put into finding the ideal location in which to integrate the Library of Things into the local community. The Upper Norwood Library, having worked in partnership with the Crystal Palace Transition Town, has welcomed the Library of Things as part of its vibrant library hub. Therefore, people can now borrow books, as well as a wide variety of practical items during their trip to the local library.

The membership programme to integrate the Library of Things is very straightforward:

i Join

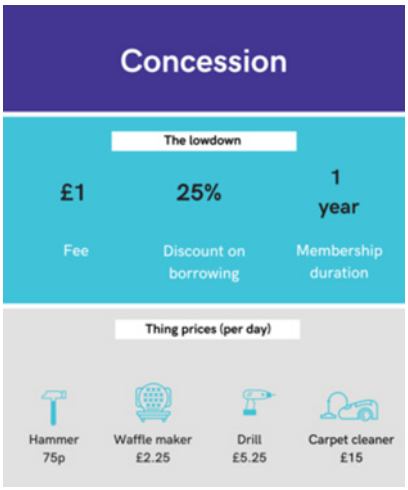
All that is required to join the Library of Things is an email and a bank card. It then takes 30 seconds to create an online account and to confirm your email.

Next, a membership plan is chosen even if it is a pay-as-you-go plan. The following three plans are offered:

Pay-As-You-Go Plan for just £1

Simple Membership at £15 for a 3-month plan

Concession Plan for those with low income or unwaged



ii Reserve

The item needed is chosen and the required date and time of use is selected. A payment by debit or credit card needs to be made to confirm the reservation.

iii Unlock

Present yourself at the local Library of Things at the time of reservation. Enter your details at the borrowing kiosk and the thing requested will be unlocked automatically. A friendly volunteer host will be available to help.

iv Borrow

The item is taken and used by the borrower along with the handy how-to guides and videos. At the end of the allocated time, the item is brought back on time to the Library of Things clean and with all its parts ready for the next borrower.

v Participate

Members can join the practical events based on sewing, making things, planting, up-cycling and repairing or becoming a volunteer host, a thing fixer, a skill sharer or an ambassador for the Library of Things (The Library of Things, 2018).

Additionally, a 'smart lock' system has been developed to enable borrowers to pick up and drop off products when the staff are not around (The Libary of Things, 2018). Along with their ambition of having a network of libraries throughout the country, this technology enables items to be available 24/7 and easily accessible on phones. (Early, 2017).

ICT has had numerous roles in developing and running this project, and these are:

1. Crowdfunding

   For the crowdfunding campaigns, communication through web copy, social media, email and, above all, videos, proved to be vital as people generally decide in a matter of seconds whether to leave or to learn more (Johnson, 2015). The websites used for the crowdfunding campaigns of this project are Indiegogo and Kickstarter.

2. Website

   As the world becomes more digitalized, having an active website is considered to be one of the most important tools for any business. This has allowed the library of things to become known and to remain competitive within the industry. According to a study carried out by Nielsen, 85 per cent of consumers will use internet search engines to find a local business. Without an online presence, the project might not have been as successful (Black, 2018).

3. Membership

   ICT was used in creating a membership programme with online payment. The interested parties can sign up easily from anywhere and pay for their opted membership package instantly. This user-friendly feature renders signing up easier and is, therefore, considered highly encouraging for new members.

4. Online Catalogue

   Members can access the Library of Things' online catalogue around-the-clock, browsing through the available items at their ease and in the comfort of their homes. Once they have decided, they can book the item required online and pick it up on site at the pre-arranged time.

5. Electronic receipts and reminders

   Electronic receipts are highly recommended, along with the printed receipt as the latter is more ephemeral than the former. Moreover, sending electronic reminders is a great tool, especially for lending services, in order to remind members when the borrowed items are due back thus eliminating the need to chase them down. For ease of convenience, the system can be set by default to send out reminders a day before an item's due date to the email listed on the corresponding borrower's file (Share Starter, 2012).

6. Inventory management tools

   Even though a Library of Things can be started without this platform, exceeding a couple of dozens of registered members or items in the inventory can quickly become highly troublesome. For example, keeping track of everything on paper or by manually emailing one by one when items are overdue will be a hassle at best – and impossible at worst. One of the solutions is to join online platforms such as myTurn to help manage the library efficiently (Share Starter, 2012).

7. Social Media

   Marketing through social media is becoming one of the most preferred marketing tools for businesses to reach their target audiences. In fact, according to Statista, it is projected that by 2018, the number of people using social media across the world would be about 2.5 billion, with a great majority of them checking these websites several times a day. Therefore, a presence of social media will significantly help the organization's exposure to the public, as well as attracting more traffic to the official website thus increasing the chance of people signing up for membership (Smith, 2018). The Upper Norwood Library of Things currently has 3 000 followers on Facebook.

Implementation

The project has been implemented in different phases, which are described briefly below.

– **Prototype**

Inspired by similar projects such as Leila in Berlin or the Sharing Depot of Toronto, in 2014 the project founders launched a pilot with used and salvaged items in an unused community room at the West Norwood Library with the help of local volunteers. The venture was considered a success as they welcomed around 1 000 people during the ten-week trial period, having only one open day per week. In total, over 100 people donated some of their belongings, and 1 in 3 returned to borrow an item (Library of Things, 2015)

Figure 2: The initial experiment of the Library of Things

– **Demonstrator**

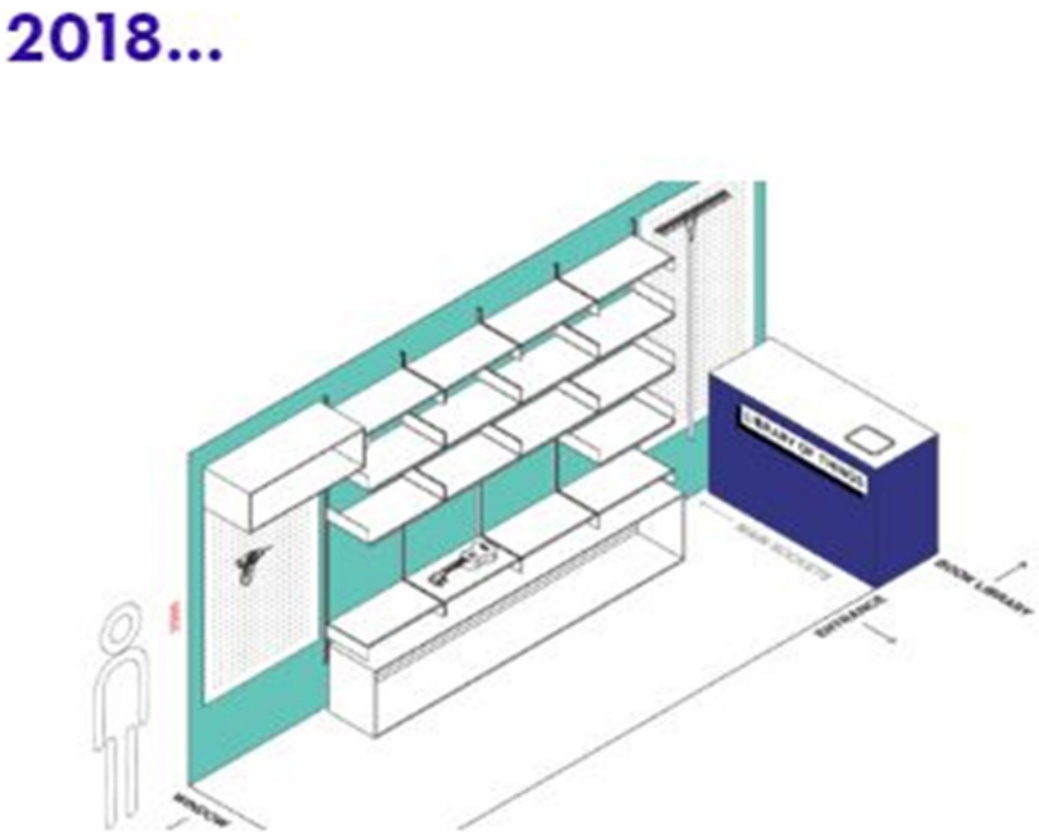
From there, after crowdfunding GBP 15 000 from 250 backers on Kickstarter, the founders progressed to a South London car park where they placed two retrofitted shipping containers meant to be the new venue of the Library of Things for the next 18 months. Three-hundred and fifty items were sourced from companies like Bosch, Kärcher, Berghaus, Patagonia and their local B&Q. These items were priced, catalogued, tagged and photographed before being put at the disposal of the public. Again, the project got a great response, with about 850 people coming to borrow different items to meet their needs.

Figure 3: The demonstrator phase of the Library of Things

– **Operation**

Finally, with the guidance of Joe Duggan, co-chairman of Crystal Palace Transition Town, which is a grassroots network with a track record of building local sustainable projects, the Crystal Palace Library of Things team crowdfunded GBP 9 375 from 291 people and organizations to get started in the community library, Upper Norwood Library Hub.

Figure 4: Smart borrowing kiosk



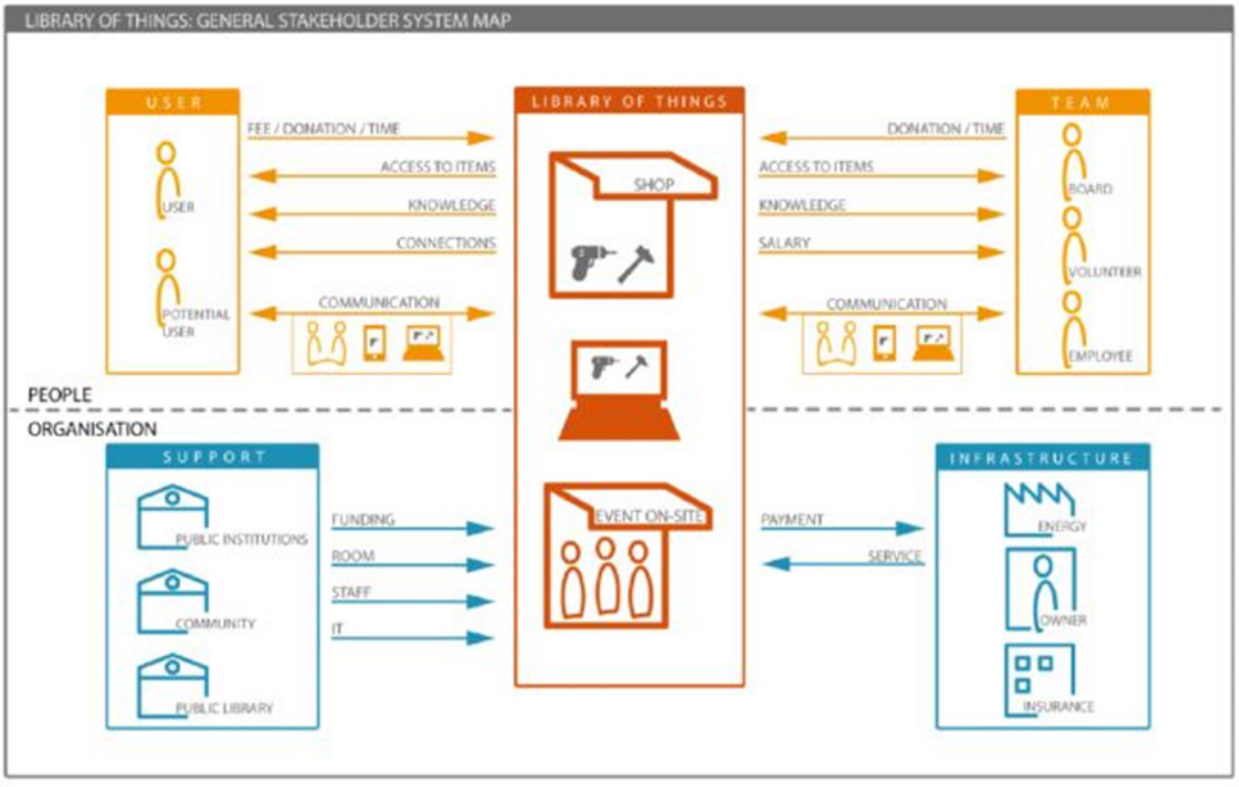
A smart 'borrowing kiosk' displaying all 100 Things available to borrow, installed into existing community spaces like libraries and housing blocks.

– **Scaling up**

The Library of Things team is now looking to expand the new smart borrowing kiosk to nine other earmarked locations around the capital over the next three years, and also to create a social franchise to assist other communities to open up their own Library of Things thus making the sharing economy a reality for everyone (The Library of Things, 2018).

For the successful operation of a Library of Things, several stakeholders need to have a symbiotic involvement, as illustrated by the figure below.

Figure 5: The Library of Things General Stakeholder System Map (Ameli, 2017)



Results

The Library of Things has closed the gap between people's willingness to share and the actual practice of sharing. Based on several surveys, it has been found that existing sharing platforms are either inconvenient for users or require too much effort from the users during the lending process. Moreover, users were found to be reluctant to share their belongings with strangers as this requires another level of trust, especially when operating through online platforms.

However, within the Library of Things, the sharing process is no longer dependent on users' willingness to donate their personal belongings as items are sourced from other means such as companies, so enabling the Library of Things to provide the users with high-quality items.

The user-friendliness of this system has already attracted over 850 members who have already borrowed more than 2 500 items throughout the course of the Library of Things' short life span. With more people using the same things, these things are being used more efficiently and fewer items are being purchased needlessly. This will enable a significant decrease in the ecological impact as products consume a great amount of energy and resources over their life span, i.e. during production, distribution, use and disposal. The Library of Things' business model helps to significantly decrease the impact on the environment, especially for products with high-energy demand during the production phase. Besides the positive environmental impacts, this project also has a strong social impact since it acts as a social hub to the community by bringing people together through practical events such as skill-sharing workshops or mending and repair classes.

Moreover, volunteering at the Library of Things or popping by to borrow something is also a great way of meeting neighbours and expanding a contact network.

This sharing economy system also saves people of all social classes considerable amounts of money by giving them access to high-quality items that they would perhaps not have been able to afford to buy, or would have had to spend a ridiculous amount on money on, in order to own it and use it only once or twice . (Perchard, 2017).

Even though the Library of Things seems to be a working business model, Rebecca Trevalyan has warned that the infrastructure in place to make things easier and lower the operating costs is not sufficiently developed. There are still numerous challenges to tackle, such as creating a feasible revenue model or a good organizational structure. However, the founders of the Library of Things remain confident about their project and are working on a franchise model to create a network of libraries and partners to replicate the Library of Things across the UK.

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Case Study 3 – Delhi: From worn-out /discarded textiles to premium ware

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Introduction

Background

The population of India has been rising at a very fast pace, especially in the cities. Cities like Kolkota, Delhi and Mumbai are very densely populated. Some of the cities in India have larger populations than many countries on other continents (the population of Delhi being 22 million). This is the result of industries and other job avenues being concentrated in these cities.

In recent years, affluence has grown too. Ordinary people have much more disposable income than was the case in the past. All this has resulted in people buying more and discarding more useable textiles. Prosperity has brought with it the burden of disposing of huge amounts of garbage in the form of discarded textile material.

This case study focuses on how this challenge can be mitigated using a revival of some of the traditional art forms and converting domestic textile waste into usable, durable premium ware.

Challenge and response

Disposing of huge amounts of waste is a challenge for any city, and this applies to the cities of India as well. All cities are looking at various means to tackle this. Some try to look at modern technologies to mitigate this challenge, others work on segregation and recycling, and yet other cities are unable to cope with this challenge.

This problem could be reduced in a very smart way by restoring, refurbishing and recycling textiles, which form a huge part of domestic waste. Two traditional Indian crafts, Kantha from West Bengal and Gabba from Kashmir, are brilliant examples of restoring and recycling large pieces of domestic textile waste.

The old fabric pieces like curtains, bed linen, turbans, lungyi, tablecloths, blankets and the like are collected by the company. These are then processed as per their customer's requirements and delivered as beautiful, durable articles ready for use. This is in tune with the Circular Economy and Cities initiative of the U4SSC, the objective of which is to look at the re-use of various resources within the city. In this case we are looking at re-using large pieces of useable/ discarded fabrics from households.

Figure 6: Examples of discarded textiles

Promoting circularity

Vision and content

In the present-day scenario, the preservation of the environment is of primary concern across the globe. Recycling, restoring and re-using are the ways to reduce waste creation. New, usable products can be generated with the resources already available, thus minimising carbon footprints. Restoration, re-using and recycling have been embedded in the Indian culture since the very beginning.

1. **Kantha** is a traditional art of West Bengal in India. During ancient times, the women of Bengal stacked layers of old, used sarees (traditional Indian female dress), and bound them together with simple hand stitches thus creating beautiful, quilts or other usable articles, depending upon the size. Motifs used were taken from the flora and fauna, everyday life and epics. These discarded sarees were thus converted into heirlooms, which were durable and also great pieces of art. Kantha is also called 'Needle Painting'.

Figure 7: Examples of Kantha of West Bengal

2. Gabba

In **Kashmir**, old, worn-out woollen blanket pieces are dyed different colours and attached together and then embroidered with vividly coloured geometric and floral patterns. The embroidery is done with simple tools like hook needles, using woollen yarn. The inspiration for the patterns are the abundant, naturally beautiful surroundings in Kashmir. A cotton lining is attached to back the rug thus created. **Gabba** is the name given to this product. These are floor coverings, throws, wall-hangings, of different sizes and shapes. These rugs could be as large as 12 feet by 8 feet (approx. 3.6 x 2.4 metres) or even more depending on the requirements, as they can be customized. These products are so durable that they last generations.

Figure 8: Gabbas of Kashmir

Both of these arts are practised even today in a contemporized manner with new designs and techniques. The objective of this case study is to highlight these forms of art from a sustainability perspective. Encouraging these traditional art forms in modern cities would save the environment by reducing the quantity of waste being generated, and at the same time preserving the traditional art forms and bringing new employment opportunities.

The surplus products, being premium products, can be sold outside the city, thus giving a boost to the economy of the city. In addition, the products can be marketed online. Some efforts at linking the craftsmen and potential buyers directly through e-platforms are also being made, in order to avoid the middlemen.

Results

Employment is generated at all levels, through the collection of the fabrics, processing, delivering, and so on. It also saves the environment by recycling the enormous amounts of fabric waste and converting it into usable articles which are very durable and aesthetically rich.

Social impact:

1. Kantha has traditionally been a women's craft, where it was practised at the domestic level. Therefore, reviving the traditional arts of Kantha and Gabba will offer new employment opportunities to women. This process of enhanced opportunities for women would lead to meeting SDG 5- Gender Equality.
2. Ancient crafts such as Kantha and Gabba will be preserved and put to use in the present context of Smart Sustainable Cities.

Economic impact:

1. Craftsmen of traditional arts in developing countries usually live in difficult financial conditions. This type of initiative would provide them with more work and enhanced income, and would thus help in the process of reduction of poverty, meeting the SDG 1 and also SDG 8, i.e. Decent Work and Economic Growth.

Environmental impact:

1. Waste disposal is a big challenge to the environment. Through this project, the amount of textile waste generated is reduced considerably, thus working towards environmental sustainability and meeting SDG 11- Sustainable Cities and Communities.

Both of these are appropriate examples of circular economy, covering the social, environmental and economical domains.

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Case Study 4 – Munich: Halle 2 second-hand store as a hotspot of the local circular economy

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Introduction

Background

Munich is a growing city with a prosperous economy. In 2017 Munich had about 1.5 million citizens. The household waste production was 637 593 tonnes per year, of these 326 096 tonnes were collected separately for recycling. The recycling rate was about 51 per cent. Munich has a long history of waste reduction, starting 126 years ago with the aim of avoiding diseases like cholera. More recently, the aim of Munich's Municipal Waste Management Corporation (AWM) has been to forge partnerships for a sustainable lifestyle for all citizens. AWM started with waste-reduction campaigns in the 1990s and implemented a separate waste-collection system in 1994. Besides the collection of paper, organic and residual waste at every building, and 960 kerbside bottle banks – not only for glass but also for metals, plastics and used clothes – Munich citizens also have the opportunity to bring their recyclables to one of the AWM recycling centres located in many districts. Here they are asked to separate their recyclables into 30 different fractions. In 1997 AWM closed a waste incinerator and stopped the landfilling of untreated waste. At the same time, AWM collects used goods via 12 recycling centres, mobile recycling centres and bulky waste collection on demand, and by direct donation.

Knowing that several waste materials can be re-used, in 2011 AWM started the first second-hand store. AWM installed special collection points on the Recycling Centres for items which are still useful, and which can still be used after repair. When this store was demolished, AWM set up a multidisciplinary working group of 15 people to create another store, and established cooperation agreements with local social enterprises, educational and community organizations to create expertise and activities that would encourage people to be more environmentally aware and active.

Challenge and response

The Mayor of Munich, Dieter Reiter, said in 2013, 'A city that grows dynamically faces enormous pressure for change. Mobility, housing space, architecture, nature, social aspects – the city administration is faced with the challenging task of creating conditions that allow the preservation of our city's identity. The cooperation of all city departments and the vigorous participation of citizens are needed to achieve the best outcome for our city and its people. This is why we have Perspective Munich!'[1] Perspective

[1] Munich Future Perspective, 2013 https://www.muenchen.de/rathaus/dam/jcr:ea585d01-a676-4ee2-889b-5345f480d44b/PM_Magazin_en_web.pdf

Munich is an urban development concept established by the City Council in 1998. So far, it has been updated four times.

In order to respond to the city's challenges and support the Perspective Munich!, the Halle 2 project was launched by the city in 2016. The project consisted in setting up a second-hand store to recycle and re-use waste materials.

The project targets are summarized below:

- Sustainable targets: The reduction of the amount of waste by selling still useful items to Munich citizens. Due to information campaigns and stronger cooperation with companies that support recycling, the number of resold items had risen in recent years.
- Social targets: Halle 2 offers Munich citizens cheap used products. Halle 2 is also used as a 're-use-lab'. AWM provides a knowledge platform for re-use ideas. At the same time, AWM tests new ways of arranging awareness-raising campaigns and public relations by installing repair cafes, by contacting stakeholders of the 'sharing economy', by providing space for upcycling workshops, and by organizing exhibitions, music performances, science conferences, lectures, and so on.
- Job perspectives: Halle 2 offers training and qualifications to social enterprises for special target groups like young or long-term unemployed people.

Promoting circularity

Vision and content

Halle 2 combines a circular economy with the idea of sustainable lifestyles in Munich. In fact, by being a second-hand store that sells goods collected in the 12 Munich Recycling Centres, Halle 2 greatly extends the lifetime of everyday items and is also a good example of embracing active, societal responsibility because it is based on strong partnerships between the city and many non-profit organizations.

Halle 2 is more than just a second-hand store; it is a 're-use lab', which means a testbed in which to develop new ways to increase the number of re-used items. Halle 2 is also a communication platform to reach people who are not interested in re-using and recycling. In Halle 2, repair cafes, auctions, information and cultural events, online-marketing activities, and so on are organized routinely. The experiences of this project are shared with other municipalities and are included in the AWM's sustainability report.

In the future, Halle 2 would be combined with the AWM's online flea market platform, the repair guide and the lending guide. The implementation of a 're-use and repair network' with all other local actors in the waste reduction field could be the next step. In the future, it could be possible to reserve goods, and receive an alert if they are collected by AWM.

Results

Halle 2 provides a long list of positive social impacts by extending the life span of the following items:

- Re-usable goods: Goods that are suited for re-use without repairs and upcycling are collected at the recycling centres and sent directly to Halle 2.
- Electronic devices: The city is cooperating with the social companies Weißer Rabe, ConDrops and AnderWerk in order to check the used electronic devices and evaluate if it is possible to repair them. Secondly, they are responsible for the obligatory security checks and documenting of the results. The devices are sent to the repair shops by AWM. All usable electronic devices will be sold afterwards at Halle 2.
- Bicycles: The social company Werkstätte für Zweiradmechanik checks and repairs the bicycles, or takes used spare parts. The company sells the repaired bicycles in its own shop but is obliged to sell a certain number at Halle 2.
- Textiles: The social company Nähwerk is responsible for the re-use of clothes. It is a subsidiary of the Catholic institution Caritas, which has introduced the nationwide label Einzigware. Einzigware is a fashion label that successfully distributes upcycled clothes. Old working clothes from AWM and also from Halle 2 staff are given to Nähwerk. Nähwerk also integrates and employs special target groups of people.

Thanks to cooperation with several social companies through Halle 2, the Munich Department of Labour and Economic Development integrated a network of social companies in its employment and qualification programme. These companies are implementing the local employment initiatives, often supported by European Social Funds and are designed to facilitate the integration of target and vulnerable groups into the local labour market.

In addition, Halle 2 is used as an information and participation platform since it provides space for exhibitions, music performances, science conferences, lectures, and other events. AWM also organizes auctions of second-hand goods every Saturday as a social event. Furthermore, it hosts a functional room which offers opportunities for seminars and other public events. It is used for campaigns, auctions, repair cafes, upcycling activities and other events to promote re-use and recycling ideas, such as:

- Catering: The non-profit organization Regenbogen Arbeit offers beverages and food as a catering service for events in Halle 2. The organization gives work perspectives to the long-term unemployed and to disabled people.
- Repair Cafe: This provides rooms for voluntary activities by Munich citizens. Experts support citizens who, for example, bring their bicycle that is in need of repair and give them advice on how to fix it. This is completely free of charge, but the participants are expected to donate something to one of the Munich social care institutions.
- Upcycling: With its Werkraum, Halle 2 offers a room for upcycling workshops for do-it-yourself amateurs, as well as for artists, and interested and skilled people. Munich vocational training schools cooperate with students of the Social Entrepreneurship Academy.

- Cooperation with educational institutions: Halle 2 offers Munich educational institutions like schools, universities or adult education establishments, various opportunities.
- Schools benefit from Halle 2 as a learning field and test bed for the awareness of re-use. Universities also use Halle 2 as a test bed for research and business cases. Institutions for adult education use Halle 2 as a platform for presentations, lectures, seminars on issues like sustainable lifestyles and problems of over-consumption, as well as for networking in the themes of circular economy and sustainability.
- Room for arts and culture: Halle 2 offers exhibition possibilities for Munich artists working on the re-use of waste. AWM also plans lectures of the second-hand books, poetry slams about waste, second-hand records disco, guided art tours on second-hand art, and so on.

Halle 2 has allowed the city of Munich to implement all the pillars of a successful and sustainable circular economy. Indeed, not only did it became a vital part of the waste prevention activities of the AWM, it also allowed Munich to achieve its strategic targets in reducing the amount of waste, in promoting the re-use of goods, in improving recycling rates and in strengthening a sustainable lifestyle for its citizens.

Halle 2 has become a strong brand as a second-hand store that facilitates cooperation with social companies, in order to make their activities more visible. The success of the project can also be measured by the number of visitors in the shop (3 500 people monthly since the beginning of 2017) and the number of re-used items (almost 15 000 articles sold per month, with an estimated revenue of EUR 50 000 per month).

Halle 2 is a good example of wide-scale collaboration between very different stakeholders and interest groups from different branches, which makes the concept of circular economy even more successful.

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Case Study 5 – Sustainable sharing platform and facility for urban consumers

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Introduction

Background

Finland is a country of 5.5 million people with a high standard of living and level of consumption, which results in a high per capita carbon and material footprint. The situation is manageable due to low population densities, a temperate climate, significant investment in infrastructure and services, as well as the still-powerful welfare state. The situation is even better in the Helsinki region with its 1.5 million inhabitants thanks to its efficient public transport system and a more dynamic economy that can embrace new technologies and business practices faster than other cities. This 'good life' makes it difficult for the government to pursue consumer-driven solutions to sustainability challenges, and for the growing large cities to implement public sustainability objectives when developing new or city districts. The squeeze on public spending is making it difficult to utilize expensive, conventional solutions that require overhauling the existing infrastructure and public services, especially when the consumption patterns change towards online and on-demand.

The traditional Finnish agrarian culture emphasized fair and sustainable sharing within the local village. However, 50 years after people migrated from smaller to larger cities in search of work, they have fully adopted a consumer mindset. The traditionally lively grassroots urban community initiatives, such as recycling, buying local food or local volunteering, are struggling to appeal to the newer generations. It is easier to be active and to contribute through social media than to take part in an organized activity with schedules and responsibilities. But recently even local communities that are self-organizing using social media are facing difficulties as their communications are disrupted by the change of algorithms on the platform.

Challenge and response

In cities, services keep concentrating in malls that are accessible only by car. Consumers would want to move into more sustainable and dense urban residential areas to avoid the need to drive in order to access social services. In rural and suburban areas, services disappear into nearby cities, and the local economy cannot sustain any new development projects except for areas destined to be suburbs for commuters. At the same time, people would like to tell themselves and others that they live sustainably and are good members of the society and the local 'village', even if they do not want to give up the lifestyle of a modern consumer.

CoReorient provides an online platform and a 24/7 physical facility that supports fair and sustainable local sharing by the local community, while accepting and adapting to the very hard constraints of society, public sector and consumer attitudes. The solution is made easy and convenient enough to appeal not just to sustainability-minded citizens, but also to the broader consumer user segments. By starting from a consumer goods rental and borrowing service ('tool library') within walking distance, people can be introduced to the concept and lifestyle changes of sharing and sustainability step by step, and critical support can be secured from stakeholders such as real estate companies. By providing multiple local and sharing economy services on the same platform, it is possible to achieve a critical mass of participants even with relatively low population densities and small geographical areas.

The CoReorient circularity project

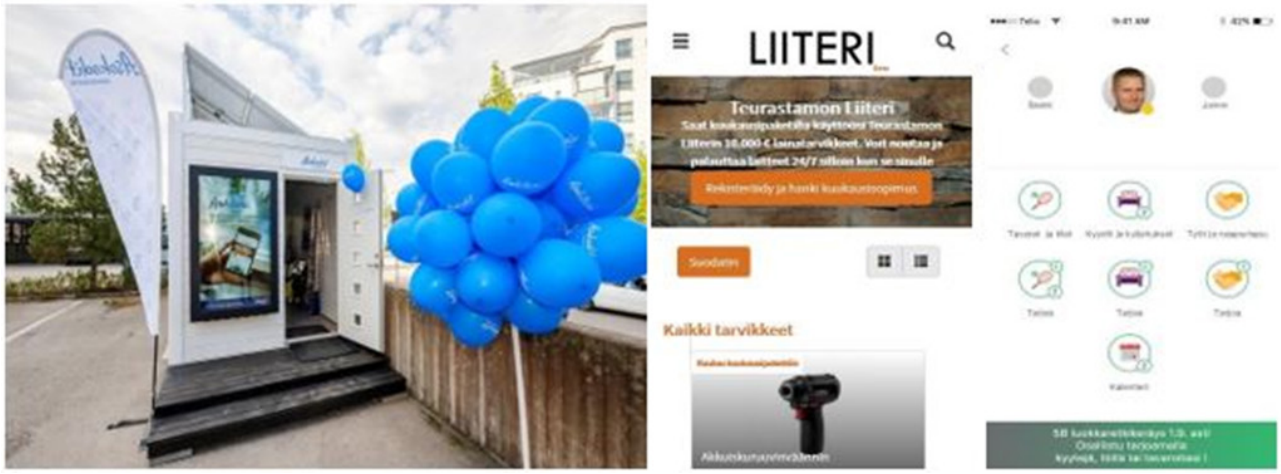
Vision and content

The vision of the project is to improve urban sustainability by rebuilding the traditional local sharing communities with scalable tools and methods that match the demands of modern consumers. This exactly merges with the vision of the two co-founders of CoReorient to make sharing easy enough and fair for everyone in the local community, in order to achieve massive reductions in CO_2 and in the material footprint, while also improving people's everyday life and social well-being. The platform effectively catalyses the transformation of any urban environment and community towards a more sustainable future. This is fully aligned with public sector strategies that emphasize sustainable development and the empowering of local communities. The smart solution mainly provides three services: customized software implementation for companies; smart space and services for sharing tools and accessing local services; and a platform to crowdsource tasks or transport from neighbours or professionals.

The key elements of the solution are:

1. Smart 24/7 physical sharing facility accessible within walking distance of local users.
2. Tool library service to secure stakeholder support and attract broad consumer segments.
3. Full-spectrum sharing platform and services: delivery pick-up point, peer rental, exchange and recycling of consumer goods, ride sharing and social deliveries, sharing of spaces, sourcing of volunteer or compensated help from neighbours, online store and associated storage for local products and services.
4. Service delivery which encourages fair and sustainable behaviour, and community building.

Figure 9: Smart 24/7 sharing facility, tool library service and more comprehensive local sharing platform



The key innovations are:

1. The solution can be accessible in a local community within walking distance.
2. The small containers are provided by a facility that can deliver them anywhere globally.
3. Integration of multiple peer-to-peer sharing economy services on the platform
4. Local businesses can integrate products and services on the platform.
5. The solution includes user experience features such as interactive display, proximity. access control, user data privacy with blockchain, closed-user groups and joint accounts, and authorisations between users.

The whole project was created and evolved thanks to ICT tools (e.g. sharing economy platforms, online store platforms, application frameworks, embedded systems, electronic locks, custom tablets, blockchains).

Results

The positive impacts of a local tool library include reduced material and carbon footprints due to a decreased consumption and selling of goods and tools; a reduced need to drive outside the area to buy them; a reduced need for storage space; and improved maintenance and increased repairs of buildings and others due to a more affordable access to appropriate tools. The impacts of the other sharing services include reduced traffic outside the area due to the local availability of services; providing support to people who need assistance when commuting; encouraging community building; and giving access to services for inhabitants of the town which otherwise would have been unaffordable or unavailable especially to vulnerable groups. In addition to the above, the platform includes other social impacts such as building social cohesion, reducing inequality, and supporting people with reduced financial, or other, means to obtain access those social services that are important to them.

The solution is designed to be sustainable without public support by operating on service revenues. Furthermore, its automation, standardized movable facilities and versatile software platform are designed to make it possible to scale it up even to small local areas. This also makes it sustainable and replicable on a larger scale and in different geographies. The solution improves the efficiency and self-sufficiency of the local ecosystem and, therefore, also increases the resilience of the local area and the surrounding city.

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