Share Economy 2.0: Libraries of Things as a new form of sharing

Najine Ameli

Abstract

The sharing of consumer goods can reduce the consumption of resources and grey energy - the energy used to manufacture things - and counteract social inequality. In addition, a significant proportion of citizens in consumer societies is willing to share consumer products collaborativly with others. However, they hardly actually do this in practice. There seems to be a gap between the willingness and practice of sharing here - and it is the reason why the share economy has so far achieved a breakthrough in only three areas - mobility, streaming of music and videos, and housing. It is demonstrated that the reason for this is the lack of an accessible service that simplifies sharing. A service that can close this gap are tool libraries and libraries of things. They have been spreading in North America and Europe since 2010 and basically work like traditional libraries, although they don't have books in their inventory, but rather a different or broader range of objects. The presented results summarize a quantitative and qualitative research of tool libraries and libraries of things. They support the hypothesis that both can spur the share economy and initiate a change in consumer culture.

Introduction and Research Questions

In the last decade, the share economy has gained increasing importance in academic research, becoming "the first new economic paradigm since the emergence of capitalism and socialism in the early 19th century that can actually take root" (Rifkin 2014: 9). In the sociological debate, also the Share Economy was „broadly and commonly envisaged as a new socio-economic model based on collaboration, access to, and the socialization of, value production, facilitated by digital technologies" (**Arcidiacono et al. 2018:** 276). The historian Trentmann mentions the Share Economy at the end of his book about 500 years of consumer history as a new development and possibly omen "of the final phase of the dominance of things. The question, however, is whether such initiatives are part of a broader development and will spread far enough to reduce the extent of the dominance of things and their legacy" (Trentmann 2017, 919). The question of whether and how this development can become more comprehensive is the analytical question that will be examined here. It matters because the share economy is also regarded as an indispensable component of a sustainable economy. Since it focuses on the collaborative use of everyday objects, the expenditure of energy and raw materials for the production of a confusingly large number of things can be reduced. For the less resources are shared, the less the individual and social ecological footprint can be reduced. Using Rifkin's argumentation, one can now indeed argue that the share economy is a new economic paradigm that contains elements of capitalism and socialism, but at the same time goes beyond both. Against Rifkin, however, it must be stated that this economic system has so

far been divided into a capitalist (Sundarajan 2016) and a counter-cultural movement (John 2017, Botsman & Rogers 2010) and has also been able to gain a foothold in only a few sectors - mobility, tourism, streaming of music and video files. The hypothesis postulated here is that tool libraries and libraries of things (both are also used as synonyms in the text) lead to the implementation and expansion of the share economy in the area of everyday objects. They function in principle like a classical library, although they have no books in their inventory, but a wide range of objects of daily use. These items can be borrowed for a pre-determined period of time, but sometimes they can also be used on site. In order to get access, an annual, usually small, membership fee is due. In this way, they contribute to the fact that less of these items have to be consumed and produced individually and less energy and resources have to be used for their production. Seen in this light, they are the antonym of the consumer society. One of the surveyed users commented this way: "I remember when I first heard about it, I thought it was a great idea. You wouldn't have to buy the stuff. You wouldn't have to store the stuff. And you wouldn't have everybody buying the separate little piece of whatever tool. I just thought that was a great idea." (Toronto 001) (Ameli 2020).

The question that now arises is why the Libraries of Things have not yet been able to spread all over the world.

Gap 1

Various surveys in recent years have shown that the willingness to share objects is high. According to a study done by Nielsen at the time of the survey, 68% of the participants worldwide (30,000 respondents from 60 countries) were willing to rent or share their personal property for a fee. Almost as many respondents were willing to use other people's products or services in a sharing community (Nielsen 2014). The evaluation of a PwC study on the Share Economy (4,500 respondents from 6 European countries) states:

„Indeed all consumers are excited about the personal benefits of participating in the sharing economy. […] Young People in particular pay higher attention to an improved quality of life instead of accumulating wealth and material property as status symbols. For them it is more important to live intensively by using resources effectively than only to work instead of experience merely to chase values. Owing things is perceived as emotional baggage that keeps you from living – sharing means being free to do whatever you want." (PwC 2018, 9). The willingness to share is also very pronounced among consumers in Germany, as a further study showed (1,009 respondents aged 18 and over): around two thirds could imagine using sharing services at the time of the survey (Verbraucherzentrale 2015). These numbers are in line with the results of the Nielsen survey. Another representative survey conducted in Germany in 2016 showed that a third of respondents would generally buy fewer things in the future if there was a so-called pay-per-use alternative (i.e. borrowing as needed for a one-off fee). 20% even said in the survey that they no longer wanted to buy any products at all if there was a permanent option of occasional use against payment (Hajek 2016). Depending on the age group, 30-50% of the respondents could even imagine using sharing offers and reducing their own property at the same time (representative survey by BMBF 2016). This statement is supported by a further survey of over 3,000 US citizens, which revealed that two-thirds of

respondents assumed that sharing could lead to the same level of user satisfaction as ownership (Accenture 2016).

What are the consumer reasons for this high willingness to share? In general, the lower price is cited as the most important factor (Balck & Cracau 2015, Finley 2013, Loose 2010). In addition, it is important for users that their own stock of "property" and the associated responsibility can be reduced by borrowing (Balck & Cracau 2015). In a survey, almost 35% of Germans polled said that property could be a "real burden" when it comes to obligations (e.g. repair, maintenance) (Hajek 2016).

Despite this widespread willingness to share, the share economy has so far only been able to establish itself in a few sectors. Paradoxically, a high level of acceptance meets a comparatively low degree of sharing practice. There must therefore be factors that prevent the willingness to share from becoming a reality in everyday life.

Surveys confirm this gap between willingness and practice: a survey in 13 European countries (12,800 respondents, approx. 1,000 respondents per country) showed that on average 35% of respondents could imagine borrowing various everyday goods. However, in the last twelve months only a good 4% of those surveyed have implemented this (INGDiba 2015). In Germany, 63% of the respondents stated that sharing offers are not very attractive for the majority of the population (BMBF 2016). In Switzerland, according to a survey by Deloitte (1,400 respondents), 55% of respondents expressed their willingness to participate in the Share Economy. However, only 18% of the respondents participated in sharing offers. Similar figures were obtained for the USA: 45% of respondents would like to participate in the Share Economy, but only 21% have already done so (Deloitte 2015: 8). In the PwC poll already mentioned, almost all respondents were convinced of the advantages of sharing, but only 44% (39% in Germany) used at least one of their services last year - and the majority did so for the media and entertainment sector (PwC 2018, 9, 18). Although the figures differ in individual cases, it is true that, according to these surveys, many people are willing to share things with others, but do so comparatively rarely in everyday practice - except for audio and video files, cars, bicycles and homes.

Reasons for Gap 1

If the acceptance of a share economy and the principle willingness to share things is high, but in practice only comparatively few things are shared, and if things are shared primarily because of economic motives, it can be concluded first of all that the existing sharing offers burden potential users with excessive costs, e.g. in the form of time or organisational effort, and are therefore impractical for everyday use. In Germany, for example, only 14% of respondents are interested in sharing or exchanging platforms; only 9% were still active there a few years ago (GfK 2015). Kessler also notes that "most of these platforms soon discovered a discomforting incongruity between enthusiasm for the concept and actual use" (Kessler, 2015). It is difficult to acquire new users for these sharing platforms, although a large number of people would share and borrow things.

On these platforms, people offer items for rent that others can borrow. To do this, however, a handover location and time must be agreed upon, which is not always easy for those involved. In addition the ways to the lender can be very long and thus time-

consuming. According to Pelz, a critical mass of things is also necessary to ensure the success of mutual lending. However, if the process is cumbersome, only a few people get into it. As a consequence, demand is low and supply too small (Pelz 2012). There are other reasons for the latter: The German sharing app "Why-Own-it" - where users could network to borrow things from each other - failed because many users wanted to borrow things, but hardly anyone wanted to make their own things available for rent. The offer was individual for each user, since the size and type of the offer available to each user correlated with the number of participating friends and their willingness to offer things. As a result, people with only a few friends did not find an attractive range of borrowable items. This led to a discrepancy between supply and demand (Glöckler 2018).

Other studies confirm this experience: In Germany, only 30% of respondents could imagine lending their own property at the time of the survey (BMBF 2016). An important reason for this discrepancy was identified as a lack of trust in strangers (Veridu 2016, 7): There is concern that strangers might not be careful with other people's borrowed property and damage or pollute it. Also mentioned was the unpleasant feeling of lack of security that stems from the fact that there are no binding standards or guidelines that can be invoked in the event of a problem (Ozcan et al. 2018, 12; Satama, 2014).

Finally, the question of who is responsible for the loss or damage of borrowed items is not formally regulated. For example, a study on the disadvantages of share economy offers revealed that 46% of the respondents felt that the lack of responsibility for problems was an obstacle to participation (Statista 2016a). 62% of users in Germany "prefer to share things when a company is involved as a facilitator because the process seems more reliable and trustworthy than dealing just with another private person" (Verbraucherzentrale 2015).

After all, there are three barriers that form the gap between the willingness to share and the practice of sharing:

1. Transaction costs: the time and organisational effort required for a lending transaction is usually considered to be too high. It therefore prevents the direct satisfaction of needs that consumers are accustomed to if they own things and can use them at any time. In addition, not only one single item is often needed, but several simultaneously. This would therefore require several ways to collect and return them, which is considered impractical in everyday life. The relevance of this barrier is reflected by a representative survey of UK population, which was conducted in 2017: For more than 70% of sharing users, convenience/availability and saving/making money are top motivations to engage in the sharing economy. However, only 5.7% of them use weekly sharing services and this can be interpreted to mean that many sharing services are too inconvenient or too expensive (Ozcan et al. 2018, 6, 13).
2. c P2P platforms, in particular, which merely act as intermediaries between private providers and users, consider it a major barrier to lend one's own things to strangers. Since no claim for damages can be asserted in the event of damage, the lack of trust is accompanied by fear of loss. To lend something from others is less critically felt by most asked ones against it. If, however, users of such sharing

platforms primarily want to borrow things, the supply of lendable things is therefore small. Since P2P platforms only become attractive to users when a variety of items are available in the rental pool (since there is a high probability that you will find what you need), demand remains correspondingly low.

3. A lack of confidence in the quality of the products: The lack of trust described above leads to a further lack of trust. If, due to a widespread distrust, no high-quality and usually expensive products are lent, a) only a few and b) often qualitatively deficient items are available. Such products, which tend to be inferior in quality, do not satisfy the demands of many users. In addition, a general lack of confidence in the quality of the offer ultimately develops.

Research Design to answer the research questions

In order to investigate the LoT as comprehensively as possible, both a quantitative and a qualitative approach were chosen. Quantitatively, an acceptance analysis of non-users was conducted in advance. These findings were contrasted with a first qualitative survey of active initiatives (51 initiatives written to, 21 of them responded).

Within the framework of five case studies (this number is within the appropriate range according to Eisenhardt (1989)) further qualitative data was collected, using semi-structured interviews with operators and semi-structured questionnaires for users. The qualitative approach allows a more flexible data collection appropriate to the dynamic research subject (see Guest et al. 2012). The heterogeneity of the case studies (Edinburgh, Ottawa, Toronto with three locations) improves the subsequent generalizability, whereas the homogeneity increases the internal validity (Yin 1994). In order to generate insights that are representative of the content (Lamnek 2005), the interview partners were selected in such a way that they could answer the questions in a well-founded way based on their experience and familiarity (Misoch 2015:186). The insights gained were finally backed up with the evaluation of quantitative data sets from 34 other locations, so that a total of 39 locations were analysed with regard to rental statistics. Based on the insights gained from the case studies, the quantitative data could be interpreted.

Introductory, in order to determine the acceptance of a library of things, an explorative online survey was first conducted in Germany between 27.07.2016 and 10.08.2016 (Milk, 2016). It involved 423 persons (with 390 complete data sets). The survey revealed the following insights: 87% of the respondents stated that they had already taken note of the Share Economy. Mobility and accommodation providers are, as in other surveys, the best known representatives. With 51%, half of all respondents had already made use of such an offer - mainly in the fields of mobility, accommodation and media & entertainment. 93% of respondents could imagine using a library of things after the concept was explained to them. The rest justified their rejection with hygiene concerns, lack of safety, poor quality, high transaction costs and the fear of becoming dependent on others. It was important to the respondents that such a facility is centrally located, has long opening hours and a wide range of goods on offer, that the lending process is as simple as in a library and that the availability of things can be viewed online.

Overcoming the Gaps with LoTs / Spreading LOTs

Through libraries of things that, like classical libraries, could be institutionalized in all cities or neighborhoods, the share economy could expand and give further impetus to the culture of sharing. 89% of UK non-users of sharing services indicate that they could use help and training in order to participate in the sharing economy. Since it is generally known how libraries work, libraries of things can also overcome this barrier (Ozcan et al. 2018, 6, 13). If the further main problems of the share economy are that the lending process is cumbersome and citizens do not want to lend objects to strangers because of lack of trust, a library of things can bridge the existing gap between desired sharing and actual sharing by making a large and qualitatively serious range of commodities easily and cheaply accessible.

As will be seen in the following chapters, these are not trivial and easy to fulfil conditions. Basic Pro- and Con-arguments can be compared as follows:

Transaction costs

Libraries of Things can reduce the transaction costs of traditional P2P offerings. First, all items are stored in one place, which minimizes transportation. Second, this centralized storage eliminates the need for arrangements. Regulated opening hours and openly visible lending and usage conditions make the service even more user-friendly. „A library in that case, where you have all the things in one place is more convenient." (Toronto, Ryan)

„This concept is against consumerism and it's convenient." (Danforth 09)

Most users didn't initially expect the ease of complication with which they could access the items in the assortment and share items with others. The fact that the Tool Library as an institution organizes shared use is also appreciated: "Actually, I could also borrow from my neighbor who specifically offered me this. But since we just moved in, I don't want to get into the situation of breaking her things. So I prefer to borrow the things I need right here." (Ottawa Tool Library – 03)

Lacking willingness to borrow things to strangers

With a library of things that takes care of all the organisational work (including the maintenance and repair of equipment), borrowing items is no longer perceived as borrowing from strangers.

The lack of trust in strangers is thus bridged and the library of things gains in obligation and reliability. Moreover, in most cases, members do not have to bring their own items into the inventory if they want to become members of the Library of Things. Finally, there are clear rules on who is liable in the event of loss or damage. Moreover, the shared good is a 'common good' and not the private property of a single person. In the case of damage, a factual discussion will therefore be easier. The Tool Library simplifies the process of shared use and this is also a major advantage over P2P sharing. „In my experience, if you break something on accident and tell them they won't charge you" (Seattle, Camila).

Lack of confidence in the quality of the products

The maintenance of the products in the loan pool, carried out by the staff of the new libraries, will ensure the provision of functional products. The concern that an item will not work is therefore unfounded and can be remedied, if necessary, by replacing the product with an equivalent one.

The first of these new types of libraries were created in 1976 as non-profit "tool libraries" in Boulder (Colorado) and Columbus (Ohio) in the United States, in 1977 in Seattle (Washington) and for the first time as part of a public library in Berkeley (California). At the same time, the first Toy Libraries were created in Australia, and in the following decades they became so widespread there that they have since organized themselves into a network.

While traditional libraries are increasingly affected by closure as a result of the digitisation of books, Libraries of Things are on the rise internationally. Although it would be obvious for libraries to expand their holdings from books to other commodities, few Libraries of Things have become part of existing public libraries. In contrast, most of the Libraries of Things currently in existence have been established as bottom-up initiatives, i.e. from citizens' initiatives or from already existing non-profit organizations as another sub-project. Especially since 2010, the number of new Libraries of Things has increased rapidly.

Total number of Lending Libraries _ Current status: June 2018
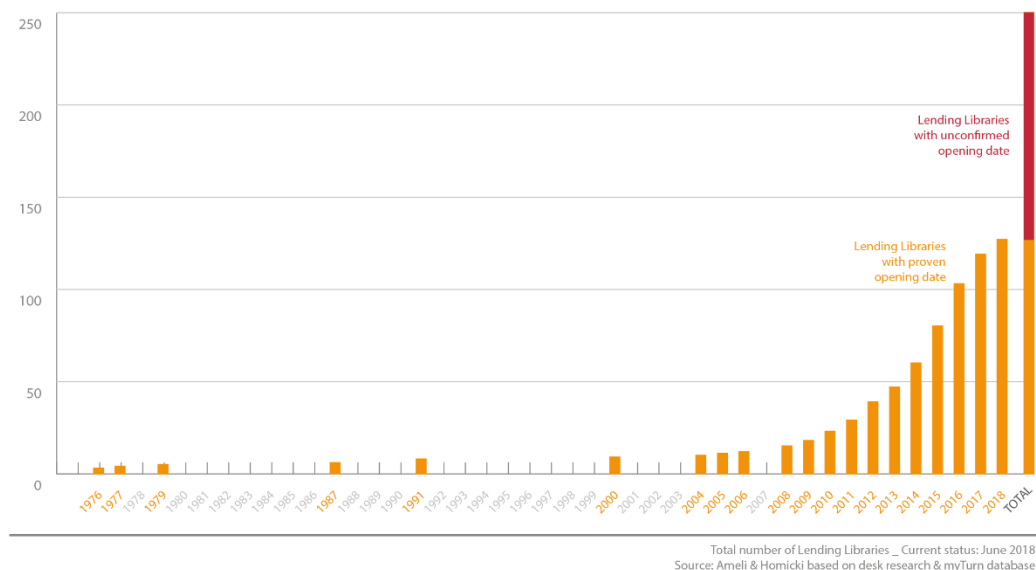Source: Ameli & Homicki based on desk research & myTurn database

Fig. 1: Number of libraries of things worldwide. Own representation.

This trend is continuing and has now also reached Europe. 33 of the 249 Libraries of Things worldwide are currently located in Europe, most of them in the UK (10) and Germany (9). Most of the new libraries are currently tool libraries (137 out of 248), making them a special case of a general Library of Things. This is because, in addition to tools, it has a wide range of items in its inventory, ranging from toys and games, sports equipment, musical instruments, items for extra-curricular activities (e.g. camping

equipment for holidays) and items for everyday activities (e.g. kitchen utensils). SCHOR 2019

Most items are added to the inventory through donations from 'strangers'. On the one hand, the items are collected before the opening, on the other hand, most initiatives still accept donations at any later date. Because the inventory of a Library of Things is not only fed by donations from members, but also by donations from other stakeholders, it is more diverse and extensive than most P2P offerings. It should be noted that the quality of the products can only be as good as the willingness of the donors to donate to the Library of Things. The inventory therefore depends on the means and possibilities of the donors. In the worst case this can lead to the disposal of cheap products at the Library of Things. However, if the budget is available, products made available for loan can also be purchased new.

Impacts of Libraries of things

The study of 39 lending libraries showed that they have not only ecological but also social, economic and cultural effects that make them an important element of sustainable development. The ecological effects initially have a relieving effect on the environment, but in the long term also on society. While social and economic effects are directly noticeable for the users, ecological effects usually remain impersonal, abstract and possibly affect other continents. For this reason, and because they are primarily economically motivated, users rarely discuss ecological effects in interviews, while social and economic effects are relatively rare.

Ecological Effects

Ecological effects are not directly perceived by the members, but are sometimes suspected: „This concept confronts consumerism in a great way. Reusability of objects is made practicable. That's good for the environment and for the community, cause people are coming together." (Danforth 01)

„I think NESTL [Northeast Seattle Tool Library] has saved me a few hundred on tool purchases, plus the environmental benefits of reducing consumption" (Seattle, Bill).

Savings of grey energy & resources

The amount of raw materials and so-called grey energy (= energy that has to be used for the production and transport of the items) saved by a library of items can only be determined directly and accurately if it is known exactly how much energy and material is used for the production of the lent items. As a rule, however, the manufacturers do not have this data at their disposal, which is partly due to the fact that many parts are manufactured by different suppliers - and how they work is often unknown or at least not sufficiently known to the seller of the end product. So if the amount of material and energy saved cannot be determined directly in most cases, an attempt must be made to indicate it indirectly and approximately: Conclusions on ecological relief effects can nevertheless be drawn by determining the number of those products that did not have to

be bought new because they were borrowed from a thing library. This number was demonstrated in a case study for the Edinburgh Tool Library:

20% of the surveyed users would have bought new items without access to ETL. Another 20% of respondents would have bought new items if they had not been able to borrow the required item from a friend. Assuming that half of the second category can borrow items from friends and the other half cannot, another 10% can add to the new buyers.

For the approximately 2,000 first time loans (repeated loans of the same user borrowing the same item don't count) of ETL, this would result in 30% or 600 avoided new purchases per year (Ameli 2019).

a) In general, the greater the selection of items on loan, the greater the likelihood that users will find what they need in the library. The larger the number of users and the number of loans per item, the fewer items of daily use need to be purchased, as they can be borrowed or repaired. The fewer items are consumed and used collaboratively instead, the greater the savings in grey energy and raw materials. The greater the number of intact donated items in the inventory of a Library of Things, the fewer items needed to be purchased for collaborative use. In addition, the longer and more often the items offered are loaned, the better the environmental impact of the inventory available in a Library of Things. This implies that their environmental performance improves when damaged items are repaired, as long as the repair is not too costly. And the higher the lending frequency of an item, the less idle time it has to stand around unused. Consequently, its resource efficiency increases.

b) In addition, the amount of grey energy and raw materials can be saved that would have been necessary for the production packaging of the otherwise newly purchased products. Conversely, the energy and resource efficiency of a packaged product increases with its lending frequency in the library. Both these factors result in ecological relief (Muthu 2016, Jindal 2010).

c) The location of a Library of Things may have a positive or negative impact on the environmental impact: If it is centrally located and/or easily accessible by public transport, on foot or by bicycle, the distance can be covered without a car, provided that the borrowed item is not too bulky or heavy for transport. Conversely, if an item is picked up and/or returned specifically by car, the environmental impact of the rental transaction is reduced. It does not deteriorate if the user would have driven past the library in his car (on the way to or from work) anyway.

(d) The potential savings can be further reduced if users use the money saved by not making a new purchase to spend on other energy and resource-consuming activities or purchases that they would not otherwise have made. That would be a rebound effect. But even if one were to take into account an empirically robust rebound effect of around 30%, which has been demonstrated for energy efficiency measures, the net savings effect or efficiency gain would still be significant (Gillingham 2013, Sorrell 2007). However, in countries with high social inequality, such as Germany, where more than 40% of households have almost no assets (Grabka/Halbmeier2019), the economic rebound effect cannot be assumed to be large, as at least part of the money saved is used to build up a financial reserve that has so far been absent or hardly available.

e) If libraries of things become socially established, the demand for cheap products of diminished quality is likely to shrink. Since similar products of high quality are available for a relatively low annual rental fee, there is no incentive to buy the inferior pedants.

And if demand falls, so does supply. Since especially products of inferior quality deteriorate rapidly and are then thrown away, both the energy and resources required for the production of junk products and the amount of waste are reduced:

"But if all those people borrowed stuff instead of buying cheap things, then the market for producing all this pricepoint garbage just dries up completely. They wouldn't have any reasons to make it. So, think about all the junky tools that are made and distributed by WalMart and whatever. They wouldn't sell anymore. So, they wouldn't be making them. And if you look at the entire supply chain of all these tools that are made. It's about the resources, the plastic, to source the metals to design it to produce, to have all the labour, to ship it accross the seas, millions of numbers. And then these tools just sit around idle!" (Toronto, Kevin)

However, ecological effects are not the only ones that make it worthwhile to think about the institutionalization of thing libraries. Social and economic effects can also be identified.

Social Effects

Quality of Life

The subjectively perceived quality of life of citizens can be enhanced by various effects that result from having a library of things within their reach - for example, simply by helping a person to save money or by giving them the opportunity to offer workshops, repair things, and thus creating meaning.

A neighbourhood can be considered more liveable because it has a library of things. For example, one user wrote about the Southeast Seattle Tool Library that it was "a great service to the community" (Seattle, Trevor). A Library of Things can improve social cohesion because it increases the subjective benefit of the members through the other members: The more members bring usable items to the library and make them available to everyone, the less there is to consume, the more workshops can be offered and new contacts made, and the more the individual benefits from the roommates in his or her neighborhood. In this way, an indirect P2P cooperation is created that can ultimately benefit everyone.

The Tool Libraries in Toronto, Ottawa and Baltimore are described as places that facilitate and strengthen a sense of community. Conversely, the concept diffuses more easily into a neighborhood if it is already a functioning community. „If it's a small community it could work. If it's already a community. These tend to work best, I have found. St. Claire we only opened two months ago [...] and it's going great. Really well, almost as good as the other locations, and we just started it, which is unbelievable! [...] We didn't create that it was already there." (Toronto, Ryan)

„ It's a great community hub. Even though we don't have space that people come and spend a lot of time, you get to know people and it's very friendly. And beside from environmental sustainability issues it helps address and builds social capital almost." (Toronto, Ria)

„And then I think after that what they [die Nutzer der Baltimore Tool Library] discover is that we have a really awesome friendly community there and it is really vibrant and it's just a kind of place that feels good to be in." (Baltimore, Piper)

atmosphere of the place is also described in an appreciative manner: „Everything is full of respect!" (Ottawa – love&hate letter)

„Everyone is spectacularly friendly and helpful!" (Ottawa – love&hate letter)

„This place is like dynamite – there is nothing you could want more!" (Ottawa Tool Library – 07)

The friendly atmosphere was described as very pleasant and special. The neighbourhood becomes more tangible through this place, where interaction can be experienced directly. „You promote the 'small town mentality' of helping your neighbour." (Ottawa – love&hate letter)

„And ever since we started the shop [the Tool Library in Baltimore] and we have an open shop night twice a week for the members. A lot of friendships are forged there. Cause members are definitely helping each other out." (Baltimore, Piper)

A library of things can offer people who did not know each other beforehand a place where they can approach each other and benefit from each other. Users said that they felt good when they came to this place. For this reason it was not a problem for most of them if they had to wait their turn. This is a fact that is usually reluctant to accept in ordinary shops. Through their membership, users also felt the good feeling of being part of a larger social movement.

Empowerment of individuals

Respondent users repeatedly commented that a Library of Things enables people to do things that would not have been possible without the provision of access. Many of the users mentioned the wide choice and the resulting increased subjective scope for action. According to many users, this room for manoeuvre is additionally expanded by consulting services and the support of staff: „It allows you to learn and try out different items. [...] I really appreciate the advice I get." (Danforth 010)

„They always lead me into the right direction. [...] I appreciate the advice on how to handle every single item correctly. " (Parkdale, 004)

"The Tool Library opens my eyes to what is possible!" [Ottawa Tool Library - 001]

"that even people you never expected to use tools to make things happen." (Ottawa Tool Library, 013)

Independence and personal resilience, resulting from almost unconditional access to things and knowledge, were highly valued. By imparting knowledge, people were empowered to do by themselves things they would not have considered before, either because they did not have the resources or because they did not feel confident enough to do the "project". In addition to the personal change, the respondents also registered changes in other people who now had access to a wide range of items. With regard to the empowerment of the individual to be able to do something, the awareness of growing autonomy, i.e. being able to determine for oneself what one can and cannot do, was emphasised as significant. This is also reflected in the next statement:

„But you can tell a visible difference in people. We hold their hands essentially and guide them how to use a mitre saw or a drill press and those are a lot scarier than some of the regular tools in the library. And it's almost as if they stand a little more straight afterwards. They smile a little bit bigger afterwards. They seem different leaving. […] we have countless individual stories about that." (Baltimore, Piper)

Only through unrestricted access has it become possible for users to better develop their potential and fulfil their wishes "barrier-free", without having to consider the respective economic means.

„Then they start to become more imaginative of what then can do." (Toronto, Arthur)

„People come in and they see all the other things they weren't even thinking about. And they are saying: Holy, I have access to all these things now! And suddenly other projects, other ideas come into their mind that they could do." (Toronto, Kevin)

„Once they are there and members, they start seeing the possibilities. There are many instances where people come in here for just one thing. And then they realize that they are a member and they can pretty much get anything else they want for free. So they start having confidence to then take on more renovations, more projects, develop a hobby. [...] It expands their horizons, that access." (Toronto, Ryan)

Economical Effects

The primary reason for many who use the services of a Library of Things is not to unburden the environment, but to unburden themselves by saving costs: "We had no idea it was gonna grow into this. We really just wanted to lend tools and we thought it's gonna stay small. But Baltimore is a pretty rough place. There is just a very small percentage of the population that is actually stable (income wise) and it's pretty dire in some circumstances." (Baltimore, Piper)

 "So for money saving and space saving reasons that's why people join initially. And then I think after that what they discover is that we have a really awesome friendly community there and it is really vibrant and it's just a kind of place that it feels good to be in" (Baltimore, Piper).

" I think usually it's because they are looking for something specific what they don't have. And they don't want to pay for it. Especially for the very expensive tools that's the most common reason why people come in for them. It's actually often cheaper to buy the annual membership than to buy the specific tool they are looking for. And then they get access to so much." (Toronto, Ria)

„Giving access for low income people. People who need to access and kind of make their lifes. To rebuild their homes very cheap. I think these are all very valid reasons." (Toronto, Lawrence).

In addition, a Library of Things supports its members not only by reducing the amount of money they have to spend on the purchase of many new items, but also by helping to save living space for the permanent storage of these items. This is not an insignificant benefit, because the inhabitants of many cities today do not have as much living space available to them as they did one or two generations ago.

„There is a generation – most of our members are between 20-40 I would say – if we look at the generation that they grew up in, with their parents being hyper consumers. Just buying everything. And now these people have to either deal with their parents downsizing or their parents passing away and happen to deal with all that stuff. Maybe realizing that they can't afford such a large space as their parents did. And even if they wanted to have all that stuff they couldn't fit it, they don't have the option to have it. So

it's out of necessity that they come to a place like us sometimes. Cause there is no other way of practically getting access to things." (Toronto, Ryan)

„So for money saving and space saving reasons that's why people join initially." (Baltimore, Piper)

This is an urban phenomenon that will affect more people around the world in the future as urbanization continues and coincides with rising rents. In the medium term, most members of the younger generations have little choice but to look for alternative consumption practices if they too wish to have access to many and/or larger consumer goods. „In the end of the day it makes just raw economic sense for an individual person to do this. And that's why it makes change. You know it appeals to everyone of any background of any income level. It just makes sense. It's just a better way to get access to things." (Toronto, Kevin)

In addition, Libraries of Things also stand for a new interpretation of the modern idea of equality: while in liberal societies the idea of equality of opportunity was elevated above all, Libraries of Things supplement this guiding idea with equality of access, which is necessary because there is hardly any real equality of opportunity: someone who grew up in a family with little cultural, social or economic capital does not have the same opportunities for advancement as an individual born in more favourable conditions (Bourdieu 1984). Nor do those who were socialised as children and young people in neighbourhoods with high crime rates or schools of below-average quality have the same opportunities for a good income and a high material standard of living as those who grew up in opposite circumstances (Stiglitz 2015, 2012, Shipler 2004).

Equal access can at least partially compensate for the weaknesses of equal opportunities by allowing people of all income groups to use things to which they would otherwise not have access due to lack of purchasing power. It also gives all individuals access to things that they cannot or do not want to acquire due to lack of space. Moreover, technological progress in the course of digitisation will in future disrupt entire branches of industry, which is likely to increase the number of unemployed people considerably (Baldwin 2019, Frey 2019, Muro et al. 2019, Winick 2018, Ford 2016, Brynjolfsson/McAfee 2016, Chace 2016). However, the less you have to buy, the less you have to work - which is why libraries of things can increase the resilience of digital societies.

Cultural Effects: Transforming the Consumer Culture

Libraries that offer tools or a wider range of products for lending seem to have a remarkable cultural function: They are an "eye opener". They present a deviation from the standard, a viable alternative to the previous use-by-ownership standard. This standard, hitherto taken for granted, is now being questioned, as it becomes obvious that it is also possible to use things in a different way. In this sense, they seem to have great transformative potential.

"I think that sharing libraries are a gateway drug to talking about a completely new economy. A completely new way of orienting the class. Cause it is so simple, so easy. People see it. And it's also good, because by default, by participating in this project, whether it's for saving money, for decluttering, minimizing or whatever it is, they are by extension fulfilling the larger goal. Which is about the climate, about humans, about civilization of species. Just by default, by participating. And I think there is something

really special about that intersection. About making it very easy to be so good". (Toronto, Lawrence)

"And do you think that sharing places like TL help to establish alternative ownership models in our society?

P: Oh my god yes. Completely. You know tools are easy cause it's something that everybody needs at some point in their lifes. Even if it's like a wrench. Something really odd. I don't want to buy it. O.k. I will go and join the TL and just borrow them. And then all of a sudden. It's like a gateway drug. You see what the possibilities are with your TL membership.

N: You are the second person using the term: TL is a gateway drug.

P: It totally is. It really is the key to the lending model. Especially in the US. Because Americans just don't want to share their shit. And that's a generational thing. My generation and younger is definitely breaking the mold on and starting to understand: Oh, it doesn't have to be that way! And I don't want it to be that way.' So that it's paving the way for things like library of things or baby-stroller shares or kitchen supply shares. It's about the idea that you don't have to own everything." (Baltimore, Piper)

Buying many things is no longer automatically the first option, as it is now recognised that the previous consumer model is not the ideal solution for many things.

"As soon as you introduce this idea to someone, they would say this makes so much sense. Nobody would say or that doesn't make any sense." (Toronto, Kevin)

The new library concept is convincing; users realize how nonsensical the previous convention is, e.g. to buy tools even if they are used relatively rarely. They realize that for the price of one larger tool (i.e. the annual membership fee), one can have access to hundreds of tools - and that this is a huge advantage.

It doesn't seem to be significant whether you enter a tool library or a library of things. Tool libraries can also trigger a rethink among users, which is based on the sharing of everyday items in general: „Do you think you change the user habits of the people? Or even the attitude of some people?" B: "Yes. I would definitely think to some it's a brand-new concept and oh my god, it's brilliant. Oh, and I would have never thought about you could borrow also tools instead of books. So, for them it would definitely be a change of habit and raising awareness for it. But others come because they live a certain lifestyle. You know, very environmentally conscious. I only buy used items. I try to keep my carbon footprint as low as possible. So, I think we help establish alternative ownership models, simply by us being there. This brings awareness to the whole sharing economy and to collaborative consumption." (Bettina, Ottawa Tool Library)

"Do you think that the TL can help to establish alternative ownership models in our society? R: I think so. […] People come in and see this model and think this would be great for instruments. So, I think it has already raised awareness for borrowing economy / sharing economy." (Toronto, Ria)

Tipping Point and Gap 2

Libraries of Things can therefore drive the expansion of the share economy and promote sustainable development. Nevertheless, this potential has so far rarely been realised. This can be seen from the fact that the average usage rate (= number of people in an urban

quarter who are members) of the 34 quantitatively examined Libraries of Things in the period 2017-2019 is on average 9% in the respective urban quarter.

Existing Libraries of Things are per se the appropriate service to close gap 1. In practice, however, they have service deficits. If the answer to the first gap was to identify a specific service, the task now is to identify the service deficits and improve them in order to close the second gap. Only if this second gap is bridged will the first gap be closed. To do this, it is necessary to achieve a usage rate of about 25% in a neighbourhood or city.

Why about 25%? Centolaet et al. (2018) have repeatedly shown in various experiments that within a group of individuals a threshold of about 25% must be reached for an attitude or behaviour to change. This threshold value can thus be described as a "critical mass". As soon as a minority reached this threshold, the group "tipped", the group dynamics changed abruptly and the majority of the group promptly adopted the new norm. In experiments, this was even the case when the rewards for maintaining the established behaviour were increased. Consequently, it can be assumed that social acceptance for libraries of things increases rapidly once the rate of use reaches this level: if about 25% of the inhabitants of a neighbourhood or city use this service, more than half would soon have to do so.

However, to reach this level, a Library of Things must be appropriately user-friendly - and they are not yet.

Reasons for Gap2

So far, Libraries of Things have barely succeeded in making sharing so easy, convenient and attractive that sharing many products becomes the preferred option for a critical mass of consumers. What are the reasons for this? While libraries can overcome the main problems of previous P2P sharing platforms, they also have to deal with new problems that together span the second gap.

1. Possession: Many fellow citizens are materially saturated and therefore have no need to share, as they already have what they need. This is especially true for individuals of the older generations who have followed the benefits-by-possession maxim for decades.

2. Discomfort with the new: In order to be able to explain the non-membership of those who live in the catchment area (= 1 km radius) of a "library" but do not use it, more than half of the respondents stated that many are not (yet) familiar with the concept and are initially sceptical about the unknown. Although the willingness to share is internationally demonstrable and great, consumers must nevertheless go to a library of things for the first time and get to know it and its idea. However, many initially have no confidence in a new institution with an unconventional concept. The concept seems unusual and sometimes there is a lack of imagination to get into a concept that deviates from the usual practice and the previous mainstream.

"So the real challenge is to get them in. To get them across the threshold." (Toronto, Arthur)

„Cause the concept isn't easy to get. The concept is based on trust. And cause some people don't have any imagination they don't get it." (Parkdale 007)

It is also stated that established habits are not easy to break: „Cause they are not familiar with the concept and are used to consumerism." (Parkdale 003)

3. Convenience: On the one hand, libraries offer convenient access to many things, on the other hand, the demand for convenience has increased. The expectations of many users are also significantly influenced by 1-click-to-buy offers and same-day-delivery promises. For some users, the opening hours, transport times, limited choice and the possible non-availability of an item weighs more heavily than the price savings associated with the sharing of items. Consequently, convenience is a reason for not perceiving the offer of a library of things. Online commerce has set a new standard in this respect within a few years:

„And do you know what the problem is [...]? It's convenience. People don't want to go out anymore for something. They need something right away. It has to be instantaneous." (Toronto, Gerald)

Libraries of Things thus should deliver a „Vastly easier to use service" anbieten, „including:24/7 pick up and drop off using things like myTurn's new ‚Self Service Kiosk Mode', Pick up and delivery services, Reserving items across multiple locations with additional pickup and drop off locations" (Gene Homicki)

As much as the special atmosphere in a library of things and the ethos of the concept in general are appreciated, frictions in the course of the service are occasionally perceived as uncomfortable „when it is very crowded once in a while and there is a long line in the library." (Danforth 004). To make the lending process more convenient and to shorten the queue, a delivery and return service and/or more staff and longer opening hours would be needed - but there is a financial barrier here.

4. Money: Due to a limited financial scope, often only small premises can be rented as a location, which are located in less attractive and strategically unfavourable districts. In addition, only a small number of staff can be paid, which manifests itself in reduced opening hours.

"We started off in our garage, cause we couldn't find a space right away." (Ottawa, Bettina)

„Well the big thing is space. If you can find space. Space to operate. Space to move into. Space to expand to. Then you can try out your idea. And the community that you are trying to build needs a space to build that community. And if there is not enough space then your community can't grow into it." (Edinburgh, Chris)

"I am overwhelmed by the amount of work personally. It hasn't always been this way. But these days I feel that we are really short on our staff." (Toronto, Ryan)

"And Frederique and I thought it would be a weekend project. We kind of thought we will open on Saturdays and organize a bit on the weekend. We never envisioned it would be something that big and that time consuming." (Ottawa, Bettina)

„You want us to be open every day? [...] We get requests and we recognize them but we don't have the human power to execute them." (Ottawa, Bettina)

Financial deficits therefore have a negative impact on user-friendliness, including the factor of convenience, since a delivery and return service also generates costs.

Ultimately, it is primarily the money factor that makes it difficult for existing LOTs to reach critical mass.

Discussion

Libraries have been important institutions for thousands of years. With the cheap mass production of books, however, their importance has declined. At the same time, ecological problems have increased with the mass production of goods. How can the consumption of energy and resources in wealthy societies be reduced without endangering material prosperity? Sharing in Libraries of Things has created a new sharing service that overcomes the shortcomings of previous sharing services, but at the same time faces new challenges. If they can be overcome, it is highly probable that the (non-commercial) share economy will expand and consumer culture will change to the extent that the ownership of many things will become less important.
Possibly, municipalities could support Libraries 2.0, provide a suitable space or finance a place, since Libraries of Things is a concept for the urban models of a Sustainable City, Sharing City and last but not least a Smart City, since it enables an intelligent use of raw materials and grey energy and furthermore improves the quality of life of the inhabitants, which is also the concern of a Smart City.

References

Accenture (2016): Is Ownership Obsolete? On: accenture.com

Ameli, N. (2020): Die neue Share Economy: Bibliotheken der Dinge. Gemeinschaftliche Nutzungen für eine nachhaltige Stadtentwicklung. |The new Share Economy: Libraries of Things. Collaborative Bielefeld: transcript (PhD Thesis)

Arcidiacono, D. et al. (2018). Sharing what? The 'sharing economy' in the sociological debate. in: The Sociological Review Monographs, 2, 275-288

Balck, B. / Cracau, D. (2015): Empirical Analysis of Customer Motives in the Shareconomy. A Cross-Sectoral Comparison. Otto-von-Guericke University Magdeburg, Working Paper, on: fww.ovgu.de/fww_media/

Baldwin, R. (2019). The Globotics Upheaval. Oxford University Press

BMBF Bundesministerium für Bildung und Forschung (2016): ZukunftsMonitorII "Tauschen, Teilen, Selbermachen" Ergebnisse. on: bmbf.de

Botsman, R. & Rogers, R. (2010): What's mine is yours. London: Collins

Bourdieu, P. (1984). Distinction. Harvard University Press

Brynjolfsson, E./McAfee, A. (2016): The second machine age. New York: W.W. Norton & Company

Centolaet D. et al. (2018): Experimental evidence for tipping points in social convention. In: Science, 6393, S. 1116-1119.

Chace, C. (2016). The Ecomomic Singularity. Three Cs

Deloitte Research (2006): The Service Revolution in Global Manufac- turing Industries. New York. Online unter: deloitte.com

Finley, K. (2013): Trust in the Sharing Economy: An Exploratory Study. on: warwick.ac.uk

Ford, M. (2016): Rise oft he robots. New York: Basic Books

Frey, C.B. (2019). The Technology Trap. Princeton University Press

GfK Verein (2015): Sharing Economy 2015. GfK Verein

Gillingham, K. (2013): The rebound effect is overplayed. in: Nature, 493, 475 f.

Glöckler, P. (2018): „Wenn eine richtige Rezession kommt, könnte es mit der Sharing
     Economy ganz schnell gehen". Interview in: brandeins, 12.

Grabka, M./ Halbmeier, Ch. (2019): Vermögensungleichheit in Deutschland bleibt trotz
     deutlich steigender Nettovermögen anhaltend hoch. in: DIW-Wochenbericht, 40,
     735-745

Hajek, S. (2016): Deine Waschmaschine, unser Auto, mein iPhone. Wirtschaftswoche.
     on: wiwo.de

INGDiba (2015): Economic Research: "My car is my castle" on: ing-diba.de

Jindal, M.K. (2010): Unpacking the packaging: Environmental Impact of packaging
     wastes. in: Journal of Environmental Research and Development, 4, 1084-1092

John, N. (2017): The Age of Sharing. Cambridge: Polity.

Kessler, S. (2015): The „Sharing Economy" Is Dead, And We Killed It. on:
     fastcompany.com

Loose, W. (2010): The State of European Car-Sharing. Final Report D 2.4 Work Package
     2. Berlin: Bundesverband Car-Sharing e.V.

Milk, A. (2016): Sharing Economy – Die Untersuchung der Akzeptanzbereitschaft aus
     Sicht der Konsumenten anhand des Beispiels einer "Bibliothek der Dinge".
     Masterarbeit: Hochschule Ruhr West.

Muro, M. et al. (2019): Automation and Artificial Intellegence. Brookings, on:
     brookings.edu

Muthu, S.S. (ed) (2016): Environmental Footprints of Packaging. Springer, Singapore

Nielsen (2014): Global Share Community Report. on: Nielsen.com

Ozcan, P. et al. (2018): Who shares and who doesn't? Results of the UK Sharing
     Economy Consumer Survey 2017. on: wrap.warwick.ac.uk/103410

Pelz, N. (2012): The Neighbourhood Workshop: A green design. University of
     Mannheim.

PwC (2018): Share Economy 2017: The new business model. Online unter: pwc.de

Rifkin, J. (2014): Zero Marginal Cost Society. New York: Palgrave Macmillan.

Satama, S. (2014): Consumer Adoption of Access-Based Consumption Services - Case
     AirBnB. on: aaltodoc.aalto.fi/bitstream

Sorrell, S. (2007): The Rebound Effect. UK Energy Research Centre, on: ukerc.ac.uk

Statista (2016a): Was sind die Nachteile von Sharing Economy-Angeboten. Online unter:
     de.statista.com

Sundararajan, A. (2016): The Sharing Economy. Cambridge: MIT Press.

Trentmann, F. (2017): Herrschaft der Dinge. München: Random House.

Verbraucherzentrale (2015): Sharing Economy: Die Sicht der Verbraucherinnen und
     Verbraucher in Deutschland. Ergebnisbericht. TNS Emnid: Verbraucherzentrale

Veridu / The People Who Share (2016): The Sharing Economy Consumer Views Survey.
     Online unter: mynewsdesk.com

Winick, E. (2018): Every study we could find on what automation will do to jobs, in one
     chart. in: MIT Technology Review, on: technologyreview.com