

Thesis-project

Interaction Design Master at K3, Malmö University, Sweden

Design for obsolete devices.

*Exploring the marginalization of users of obsolete devices
regarding the Swedish public services' digitalization.*

Design for obsolete devices.

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Abstract

This thesis project addresses the obsolescence of technology through the lens of accessibility to public services. It explores the processes by which electronic devices age in regards to a technological normativity that marginalizes owners of obsolete devices. My research focuses on two main questions:

How might we enable owners of non-smart phones to have access to public services that have been digitalized?

How might we design public services' infrastructure in a way that challenges the obsolescence processes of technological devices?

The research is based upon a critical analysis of the term 'obsolescence', low-tech approaches and studies that examine the accessibility of technology. This work is based on the study of the digitalization of public services in Sweden, with specific attention to public transportation and to the electronic identification technology which enables access

to various essential public services. I present the exploration of these services through the lens of obsolescence and encounter with users of obsolete devices. This leads to the design of two prototypes that propose ways of integrating obsolete devices' users in the existing digitalized Swedish infrastructures, followed by their analysis.

The designs seek to take a critical stand on technological progress as it is understood in the technology industry and propose ways of reimagining the digitalization of public services while taking into account the obsolescence processes they foster.

Overall, I argue for design for obsolete devices as a way of caring for groups that are put aside during technological innovation processes. I propose ways of 'circuit bending' public services' infrastructures in a way that is more hospitable to obsolete devices.

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INTRODUCTION

General grounding

This thesis project explores obsolete digital devices as being an essential but hidden part of our technological landscape. Indeed, most devices' users do not own last-generation devices, and sometimes don't even have fully functioning devices. Through this acknowledgement, I intend to consider obsolete technology's users, who are generally not targeted by the innovation industry. The unequal access to new technologies causes disparities in access to public services, democratic life, education or social life. In developed countries, the mainstream technological environment has become hostile to people who can't afford last generation devices or don't know how to use them. This thesis explores ways of reintegrating these obsolete devices' users in services used daily that now rely on the omnipresent need for internet connection. It will specifically focus on a case study: the digitalization of public services in Sweden, as owning recent electronic devices is preferable for accessing easily healthcare, administration or public transportation. In some way, the technological environment has transformed in a way that is not thought anymore for humans only, but rather for bodies enhanced with a permanent internet connection.

Nonetheless, the ambition of this thesis goes beyond accessibility, since technological development has an impact on ecosystems and societies in general, the materiality of digital technologies through their impacts on ecosystems is addressed. It is based on the assumption that design is generally meant for last-generation devices. The thesis will explore the tendency of technological innovation to be oriented design towards 'new markets and uses' (Roussilhe, 2020) rather than sustainable ways of designing our technological environment as a primary goal. There are different dynamics of obsolescence of technological devices, that Matteo Zallio and Damon Berry (2017) call 'premature ageing' that can be explained with hardware malfunctions (for example the accelerated ageing of batteries), but also by a consumerist society which would lead to a premature replacement of well-working products. For example, the two years phone contracts have a very significant impact on the frequency at which people change their phones, generally when renewing a new contract (Huang and Truong, 2008). This environment that normalizes on one side the exponential consumption and production of technologies, and on the other side isolates marginal and discriminated populations is to be explored in this thesis.

I will argue for a design for obsolete devices as a critique to a design for last-generation products which on one side accelerates the need for replacing devices and on the other marginalizes people who can't procure last-generation devices.

Contribution to IxD

This work seeks to contribute in the first place to studies for alternative

ways of designing, producing and consuming hardware devices (eg. maintenance and repair studies (Denis and Pontille, 2019; Jackson, 2014) and low-techs studies (Roussilhe, 2020).

It also contributes to the body of work around the accessibility of technologies such as the ICT4D (Information and Communication Technology for Development) community which focuses on the access of new technologies for rural and underserved areas of the world. On a more specific level, it contributes to public service design.

This work will also contribute to studies inquiring about the place and impact of humans on ecosystems such as sustainable interaction design (Blevis, 2007), Lo-TEKs (Watson, 2020), nonanthropocentrism (DiSalvo and Lukens, 2011) or the LIMITS community (Nardi et.al). It will also relate to techno-critical approaches to IxD and innovation such as value-sensitive design (Friedman & Khan, 2008) or critical and speculative design (Dunne & Raby, 2013, 2001) by proposing alternative visions of technological infrastructures.

This transdisciplinary approach will contribute to the existing discussions in IxD about the ethical responsibility of the designer and the design industry towards living ecosystems. On a more general level, this thesis project aims to support existing practices that situate themselves outside the dominant model of the use of technology.

Research question

This research is framed around exploring approaches to obsolete technologies and devices. The main orientation taken is the coexistence of older digital technologies with last-generation devices and services. It specifically focuses on the use of smartphones compared to older phones with no internet access as it is a technology that is evolving rapidly, and the devices become obsolete particularly fast because of the market dynamics, but also the fragility of the materials employed in the conception. Owning a smartphone has now become a norm, and not owning one could be considered as incapacitating for being integrated in an occidental society.

This thesis explores ways of designing while taking into account the responsibility of public services to produce obsolescence by causing exclusion for outdated devices' users. I will especially focus on one case study: the digitalization of public services in Sweden, and the disparities of access that result from it.

Through my design process, I address the following questions:

How might we enable owners of non-smart phones to have access to public services that have been digitalized?

How might we design public services' infrastructure in a way that challenges the obsolescence processes of technological devices?

THEORY OVERVIEW

Obsolescence

Background of the term 'obsolescence'

The history of the term 'obsolescence' starts with the concept of 'planned obsolescence', first described by the real estate broker Bernard London in 1932 in his article "Ending the Depression Through Planned Obsolescence" where he argues for planned obsolescence as a way of fostering economical growth by making the society produce and consume more products in the context of the Great Depression.

"I would have the Government assign a lease of life to shoes and homes and machines, to all products of manufacture, mining and agriculture, when they are first created, and they would be sold and used within the term of their existence definitely known by the consumer. After the allotted time had expired, these things would be legally "dead" and would be controlled by the duly appointed governmental agency and destroyed if there is widespread unemployment. New products would constantly be pouring forth from the factories and marketplaces, to take the place of the obsolete, and the wheels of industry would be kept going and employment regularized and assured for the masses." (London, 1932, p.2)

This idea of obsolescence as the normal course of things (commercial goods are ageing and therefore become too old and should be replaced) is very related to the way of envisioning the consumption of goods and services in a capitalist society. Kristoffer Gansing (2013) describes in his thesis dissertation technological evolution as being based on the production of obsolescence. He relates this linear vision of the development and with time the replacement of technologies to the Schumpeterian concept of creative destruction, seeing replacement of old technologies by new ones as a persistent process under capitalism that is called 'radical innovation'. In reaction to this linear conception of technological progress, Gansing argues for a network view grounded on the cultural aspect of how technology is practiced and performed at a given time. The normativity of technological evolution is therefore challenged with what he calls "heretic counter-practices and strategies" (p.79). Nonetheless, this linear vision of progress is still dominant, and the constant making of obsolescence has become normative.

Socio-cultural aspects of obsolescence

Consumer behaviour is generally presented as a major way of impacting obsolescence (Cooper, 2010) by making people keep objects for longer for the reason that they could be seen as responsible for discarding functional products for better ones. If users have the power in choosing which technology they want to use or not, it is restricted by their social, cultural and economical environment. Therefore, factors such as the cost of good quality products, access to public services mainly available through a smartphone or the social networks used by their relatives to communicate will have an impact on the

life span of a phone according to which functions they can fulfil and what are its owner needs and aspirations. In a qualitative study on the lifespan of phones, Elaine Huang and Khai Truong had already identified in 2008 reasons for replacing devices that were still functioning properly. The main reason for the participants of the study to replace their phones was economical (a discount, or the renewal of their contract), the second one was the desire for more features and functionalities. Then only came the replacement of phones because of a breakdown or dysfunction. This example illustrates very significantly the impact of the context over the breakdown of the object as a motive of replacement.

These external reasons that push users into changing their devices can be related to the notion of ‘premature ageing’ coined by the design activist Matteo Zallio and HCI researcher Damon Berry in 2017 which relates to hardware malfunctions (for example the accelerated ageing of batteries), but also by a consumerist society which would lead to a premature replacement of well-working products. This aspect relates particularly to Huang and Truong’s research outcome about the significant impact of two years phones contracts on the frequency at which people change their phones, generally when renewing a new contract.

‘Premature ageing’ is thus relating obsolescence to a process drawn by external causes and not by a predefined life cycle of the object. Therefore, describing the different forces that produce obsolescence in a given context would be an indivisible aspect of the properties of the device itself. In other words, and to recontextualize this to the scope of this thesis, electronic devices are becoming obsolete because of the technological, social and cultural environment around them. Aspects such as the choice of a state to restrain the access to public services to latter devices will play a role in the obsolescence process of older devices that are not supported anymore by the service.

Design approaches to systemic obsolescence

In design, approaches have been taken to respond to the normalized obsolescence production. Various angles on the end life of digital products have been documented from different parts of objects lifespan: from the object’s conception to the extension of the object’s life. There is also another level that goes beyond the object itself and related to an individual and societal scale: prevention.

In an ethnographic study of hackerspaces, fablabs and repair shops¹, Nicolas Nova argues that all these places could be compared to laboratories, where situated knowledge about the technology manipulated is produced. This informs on other ways of caring for electronic devices and rethinking end-of-life scenarios while taking into account existing systems and skills that already exist to make changes in the perception of the obsolete: repairing an electronic device means taking the risk to spend money in an object that might not be compatible with essential services in the next months or years.

This attention to infrastructures underlying disruptions in the the conven-



¹ Dr Smartphone, Nova Repair shops ethnographic study (Nova) <https://www.hesge.ch/head/projet/mobile-repair-cultures-reparation-informelle-innovation-silencieuse-cas-des-smartphones>

tional life-cycle of an object in a consumerist society (purchase, use, discard) were tackled by Steven J. Jackson (2014), in which he coined the term 'Broken world thinking', a perspective on the fragility of the world we live in and how it is being constantly creatively restored. It is a critical vision of technological innovation, as it focuses on the constant maintenance efforts rather than on an idea of linear progress. Nonetheless, it has been criticized in Linda Hilfing Ritasdatter's thesis dissertation (2019, pp.159-174) as being a western-centered vision of the world enounced in the 'broken world thinking' expression.

Isn't the "world" of "broken-world thinking" tightly connected to a specifically Western understanding of "world" as un-broken, that is, a flow of flawlessly running systems and processes? Albeit one where the one engaging in "broken-world thinking" realizes that this stability is not ontological to the systems, but rather continuously enacted through invisible repair and maintenance. (Ritasdatter, pp.173-174)

Her critique is interrogating the fluidity of occidental lives, and how what might be considered hidden or invisible comes actually from the privileged position one can speak from. This highlights the importance for practitioners of being clear on the perspective they adopt on a topic. In the case of Obsolescence, a simple opposition between the normative up-to-date world pushed by the industry and obsolete world made of old objects would be reducing the view on the topic to a privileged gaze. Instead, we should acknowledge that different realities exist when we take the world as a scope, and that pushing a vision of obsolete technologies being completely forgotten would mask the areas of the world where the use of these same technologies would be a norm. The direction I am taking for my work is going towards an understanding of technology as vernacular to subvert the hegemonic vision of it.

Approaches questioning the end life of objects in more unconventional ways have also been of great inspiration for this thesis as they come to the point of challenging the mediums for designing.

This is particularly explicit in Hertz and Parikka's work when they propose 'Zombie Media' (2012) as opposed to 'dead media' to critique planned obsolescence of technological objects. This approach consists in repurposing and diverting obsolete devices by reactivating them in creative ways. They propose 'circuit bending', a practice invented by the artist Reed Ghazala, which consists in modifying the electronic circuit of everyday objects in order to give them new behaviours. Nonetheless, the finality of the design is to carry a critique of the forces that create 'dead media', rather than actual possibilities for these 'zombies' to find their place again in people's lives other than in museums.

What I am aiming for is more pragmatic propositions for facing obsolescence. Will Odom (2009) proposes to design 'objects that improve over time' as a way of changing the temporality by which we built or relation to digital objects. This approach is closely related to the emotional bonds that we create with objects and explores ways for technologies to subsist in time. Here, rather than being only a discourse, the causes of obsolescence are taken in consideration in the design of objects with the intent of re-thinking the consumption of

objects outside the scope of trends.

With the same aim of embedding in the designs seeds for long-term connection with the user, Cristiano Storni (2014) suggests to empower the user by keeping visible the traces of construction of the devices to make it easier for the users to appropriate them. The emphasis here is not anymore on an emotional motivation to keep an object, but on education to the technologies we own which would be an opportunity for emancipating from technological objects that can't be understood, repaired or maintained because they are designed as black boxes. This critique meets the argument of the Austrian philosopher Ivan Illich (1973) when he presents convivial tools as allowing (among other dimensions) for autonomy from the one who uses it.

Miles Park (2010, p.77) proposes different ways for 'defying obsolescence' that are drawn upon examples of products, behaviours and societal factors. He mostly talks from a product designer point of view, which therefore includes digital devices but does not confine to them as the article explores a wider spectrum of electronic devices. Two of the approaches presented in the article were particularly relevant to my project as the focus on older technologies that become obsolete not for dysfunctional reasons, but because of other emerging technologies and uses that surround them.

'Ageing gracefully' (Park, p.83) is related to the robustness of the materials employed in the conception of the product. To me though, it could go beyond this by taking into consideration the external causes of obsolescence, such as the socio-cultural environment that impact the ageing of products whether or not they are robust. 'Piggybacking' (Park, p.87) is a way of adding another device to the existing one that cannot fulfil its function anymore to sustain its use for a longer time². This last example is particularly interesting because it takes in consideration connections with other devices and actors from different generations. One object on its own will difficultly challenge obsolescence processes simply because obsolescence is not just about individual object, technologies and devices, but embedded in complex systems. The orientation taken in this thesis is therefore not to design objects that would last longer, but to rethink the environment of the objects that provoke obsolescence.

² The example taken by the author is 'set-top boxes' for analog television sets in order to extend the potential uses one can make of them by enabling the access to digital broadcasting services.

Synthesis

This section aimed to unpack the term 'obsolescence' when related to digital devices. If the obsolescence of an object depends on a socio-cultural context, the question is therefore who or what is defining certain technologies as obsolete. Describing certain technologies as obsolete is not wrong but it requires to be contextualized in order to be meaningful. I propose for this thesis to use the terms 'obsolete' and 'obsolescence' from the dominant point of view which sees technological progress as linear and aligned to the production of the most powerful electronic industries.

Impacts of 'new' technologies

The thesis is aligned with theories that are critical to the exponential production and consumption of technological products. The LIMITS movement (Nardi et al) is an example of the design community around the “exponential growth” that does not acknowledge the limits of the world we live especially in terms of resources. The concept of “cornucopian paradigm” is also employed by different communities of researchers (Nardi et al; Widdicks & Pargman, 2019; Priest et.al, 2019). If it seems to be generally associated with the environmental footprint of the internet (datacenters and households energy consumption related to internet use), the definition given by Nardi et al applies to a larger scope of impacts as they describe the cornucopian paradigm as referring to “where the design of new services stimulates demand, which drives growth of increased infrastructure capacity, which then cycles back to enable the design of new services in a self-perpetuating cycle” (p.88).

Because digital technologies have a material impact on the ecosystems (Kallis, 2011), alternative movements to the current practices of technological innovation are growing.

Another view on technological innovation

Low-techs

Low-technology approaches are a way of questioning technology and what exactly is “high”-technology, and what is its cost. According to Gauthier Roussilhe (2020):

“low-tech” tries to give its place to technical knowledge, modern or not, in a limited world but also to reveal, once again, the material conditions of production of the systems that surround us. (Roussilhe, 2020)

Lo-TEK

Lo-TEK is an extension of this term proposed by the anthropologist Julia Watson (2020) as a way of rethinking innovation by taking inspiration from indigenous knowledge and practices and creating a new “mythology of technology” that would recognize and be critical to the coexistence of humans, living species and non-living things³. Aligned with nonanthropocentric perspectives, both of these visions argue for taking in consideration the larger context around technologies, wider than human societies.

³ Her definition of the term “Lo-TEK” she coined : “a design movement to rebuild an understanding of indigenous philosophy and vernacular architecture that generates sustainable, climate-resilient infrastructure.”(p.21)

Situated digital technologies

Nicolas Nova and Gauthier Roussilhe (2020) argue that the term low-tech has semantic ambiguities especially due to the binary vision of technology as ‘high’ or ‘low’. They argue that the distinction between what is ‘high’ and ‘low’ is based on changing criteria, and that the binarity should be seen more as a continuum. This is why they propose “situated digital technology” as an

alternative way of rethinking design practices when dealing with technological stakes in relation to the environmental crisis. They recommend to tackle the issue at several scale, the smallest one being the materiality of the device and its infrastructure, the intermediate one being the localization of the device and its infrastructure on earth, and the last one being the global impact of the existence of the device on earth.

Synthesis

Low-tech approaches should not elude the reality that we all live and interact with low-techs on a daily basis. Nonetheless, because they are often partly or entirely not supported anymore by services and infrastructures, they tend to be replaced when another alternative is presented.

Designing with the awareness of obsolescence processes and the role that we might play means having another view on technological innovation that is not incompatible with design, but should rather be tackled as it represents challenges of sustainability, but also of accessibility.

The distribution of obsolescence: global digital divide and accessibility

The approaches described in the previous section aim to recognize the relation between technologies and their environment. This results in strong arguments for leaning towards low, obsolete, old technologies as a mean of preventing eco-systems from being damaged and criticizing mainstream technological innovation. Nonetheless, another challenge remains for the coexistence of technologies from diverse generations. Accessibility to technology is a criterion to be part of society at different levels. Those owning devices considered obsolete face particular situations of exclusions that should not be overlooked when arguing for a design for obsolete devices. Otherwise, the risk would be to present a glamorized vision of lives deprived of services relying on recent technologies that are sometimes essential.

The unequal distribution of technology

Age, disabilities, race, economic situation and other socioeconomic factors can exclude certain populations from an environment that requires a constant internet connection.

The coronavirus pandemic made obvious the requirement for citizens to have enough internet access and enough devices to support homeschooling and remote work for all the members of a household. In situations where those conditions were not met, this resulted in an exclusion of students from being able to follow their classes as few other alternatives were possible. A

study from the UNESCO conducted in May 2020 (Giannini, S., 15 May 2020) on countries relying on online learning platforms for education demonstrates that significant shares of the global population do not have an internet connection in the household. The disparities of access are significantly different according to the area of the world. If 14% of students from Western Europe did not have access to internet at home during this period, 49% of students are concerned in Pacific Asia, and 80% in Sub-Saharan Africa with a global average of 47% of student not being able to access the online education implemented in their country during the pandemic.

If this example could be perceived as an exceptional situation as the pandemic will hopefully ultimately end, some aspects of this improvised digitalization might appear convenient and be maintained as a perennial part of education systems.

Internet access being central to most recent technological innovations, it is still not available to all the population even in countries that could be considered as leaders in the development of new technologies. For example the United States count 7% of adults who cannot access internet. A survey from the Pew research Center (2021) on a representative sample of 1,502 US citizens exposes the profiles of offline US citizens. The main incidence is the age, with 25% of the +65 years old who are offline, against less than 5% for the other shares of the sample. Other factors such as the income amount, the educational attainment or the isolation from urban environments show significant variations (from 13 to 5% of the sample) in the internet access.

These differences of excluded profiles reproduce existing discriminatory traits that can be observed in the society. As Fang et al (2018) suggests, this can be explained by the existing structures and systems that are “designed by and for persons in more advantageous social positions”, which leads to disparities in the digital resources distribution.

The global digital divide

As mentioned previously with the example of online education, inequalities regarding the access to technology exist at the scale of a country, but also at a worldwide scale. The infrastructures like the network coverage or the access to hardware makes communities from underprivileged areas of the world unable to access the same quality level for digital services as in other countries.

“The world has a digital divide that represents differences among countries in technology utilization, technology accessibility, economic level, and government support”. (Pick et al, 2012)

These disparities of access of technology impact the way they are perceived in regards to their context of use. The life cycle of smartphones is an applicable example of this, as they are in priority distributed to populations from developed countries⁴, where once discarded, find a second life in developing countries such as Uganda (Houston, 2017), where they are being repaired,

⁴ The global digital divide is generally associated to the categorization of developed and developing countries, even though such classification and terminology can be criticized.

repurposed or recycled. Eventually, the repaired phones will be bought by local population.

The definition of progress and what efficiency, usefulness or novelty means is highly dependent on the context. Depending on which perspective we take (where do we speak from? for whom do we speak for?), telling which technology is the latest or the best would be fluctuating. Nonetheless, standards are imposed by the countries where the leading technology companies are, and having another vision of technological progress would potentially lead to a political, economical and cultural disadvantage regarding the rest of the world. This bridges with Donna Haraway's (1988) position on the hegemony of knowledge, which she argues is instead situated, and plural: 'situated knowledges'. Thus, the norm of technology promoted by the technology industry could be understood as what she calls 'positioned rationality' and a 'view from above' (p.590). This understanding of the contemporary state of technology is embedded in top-down dynamics that make the vision of the world of the most privileged more legitimate.

Synthesis

How we value a technology over another is related to how we value their users. If we forget to design for a certain type of technology, then we also forget to design for their users.

Labelling a technology or an object as obsolete could suggest that it does not exist any more, or shouldn't because it is outdated. However, regardless of potential arguments for the disparition of the said obsolete element, the people who use it are well alive and deserve being taken into consideration. Instead, it is important to have a close look at how the said obsolete objects are being in use in a world that is not willing to make efforts to support their use.

The politics behind the disparities of access to newer technologies and desires for equality are not incompatible with the ambitions of environmental sustainability introduced in the previous section. A low-tech approach to obsolescence does not mean a regression in terms of access to digital services if we consider the fact that technological innovation has already left behind and marginalized populations.

CASE STUDY

The digitalization of public services in Sweden

Sweden is an interesting example when talking about technological innovation. The Swedish social innovation that is generally cited as an exemplar worldwide relies on technological progress and computerization of public infrastructures. Programs like ‘Smart city Sweden’⁵ aim to fulfil the environmental goals of the city through the use of data and technological progress. This type of tendency could be recontextualized in a general trend towards digitalization of public services. Christine Legner et.al (2017) define digitalization as a process by which digital technologies transform the society at different scales:

“The term digitalization has been coined to describe the manifold sociotechnical phenomena and processes of adopting and using these [digital] technologies in broader individual, organizational, and societal contexts.”

Alston (2020) argues that the emerging “digital welfare states” and the digital transformation of public services raise concerns from the perspective of human rights in matters of surveillance, privacy or discrimination. On the other side, he highlights the potential benefits of digitalization to “create huge savings for citizens, governments, and businesses by reducing transaction costs, increasing efficiency, and driving innovation in service delivery, particularly to the poorest and most disadvantaged groups in society”. Blix and Jeansson (2019) when presenting the potential benefits of the digitalization of healthcare services in Sweden highlight a contrast between an initial ambition of the implementation of telemedicine to make healthcare ‘more democratic’, and the lack of data about the population who actually benefit from this digitalization:

“A relevant question in regard to the future of telemedicine is whether the previous figures are evidence of socioeconomic segregation, with high-income earners from the capital being the main beneficiaries of telemedicine, while other regions benefit less.”

This question connects with more general concerns from the field of Participatory Design and Information Technologies, where scholars raise the issue of marginalization caused by ‘top-down digitalization’ (Saad-Sulonen et.al, 2020, p.77) of public services, which therefore do not fulfill democratic access to them.

In the following section, I will present a study of three Swedish public services: healthcare (Vårdcentral and 1177.se), tax agency (Skatteverket) and public transportation (Skånetrafiken). They are analysed from the perspective of the potential exclusion that the digitalization of these public services can foster towards obsolete devices’ users.

The details of the empirical inquiry I conducted (through interviews, phone calls to the services and observation) can be found in the methodology and design process sections.

⁵ “Smart City Sweden is a state-funded export platform that initiates cooperation between Sweden and other countries within smart & sustainable city solutions.”

<https://smartcitysweden.com/about/>

Analysis of three digitalized Swedish public services

BankID: an electronic identification system for Swedish public healthcare and tax agency

Owning a BankID when living in Sweden is often described as being essential for accessing certain public services but also private services widely used by Swedish citizens such as the mobile payment app “Swish” which also relies on this identification system. Nonetheless, a significant share of the Swedish population still doesn’t own a BankID in 2021, which is clustered in older and underaged Swedish population⁶.

The BankID allows one to prove their identity and therefore to access digital services for booking medical appointments, paying taxes or signing official documents. The most spreaded version of BankID is the Mobile Version, which requires the ownership of a smartphone to download an app which supports it. The ownership of a recent smartphone is required as for example the iOS 12 will be required from June 2021 for being able to use the service. This means that older versions of iPhones that cannot support this system update will become obsolete from the perspective of this service.

Other possibilities for supporting a bankID are available for people who own a computer:

- ‘Bank-id on file’ which relies on a software installed on one’s computer and combined to a password that only the user knows. It is important to note that recent system version are required for the software to be used⁷.
- ‘Bank-id on card’ which requires a device that is to be connected to a computer to read the card when an identification is required. It relies on the same security software as ‘BankID on file’.

The Swedish public services propose alternatives for identification for people who do not have access to a BankID. Nonetheless, it relies mostly on calling the said services on hotlines that are generally crowded. Generally, the first interactions on the line will be with an interactive voice response system (IVR), which consists in vocal menus and pre-recorded information.

An example of the struggle of getting a medical appointment with a doctor without a BankID was given by a foreign student living in Sweden on a blog⁸. On the next page, I mapped the experience⁹ depicted by the author with the different services shes has been in contact with. It is interesting to note that she was not able to take an appointment, and chose to wait a few hours and go to a physical drop-in appointment instead.

⁶ 67,1% of the 13-20 years old, 66,4% of the 71-80 years old and 37,9% of the 81+ years old had a Bank ID in 2020 in Sweden against above 98% for the 21-50 years old. It is not mentioned whether or not immigrants who do not have the Swedish citizenship were taken in consideration.

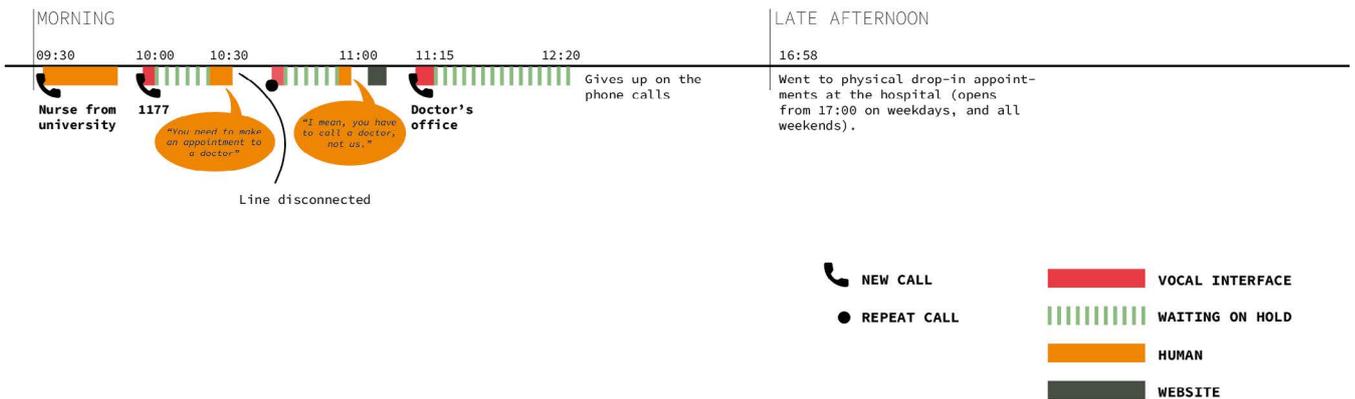
<https://www.statista.com/statistics/828739/share-of-population-with-a-bankid-sweden/>

⁷ <https://support.bankid.com/sv/felavhjalpning/systemkrav>

⁸ <https://studyinsweden.se/blogs/2016/11/07/doctor-without-personal-number/>

Getting an appointment to the doctor when you feel sick

Approximative times



⁹ Sketch of the process of getting a doctor appointment in Sweden

Skånetrafiken

Skånetrafiken is the public transportation company in the region of Malmö, called Skåne. It is also the name of a smartphone application from which key functionalities are accessible: finding an itinerary, buying a monthly subscription, buying a single ticket or getting information on potential delays in real-time. Just like the BankID technology, using public transportation in Skåne is possible without the application, but is made more difficult in several regards.

The ticket purchase is the most constraining aspect of not owning the application, as the other purchase options (transportation card, payment with credit card, ticket terminals) tend to be more expensive and less flexible. On the side of finding a route and making connections between different transportations, the necessary information is not always displayed at the stops as users are expected to have the app with them. It is specifically an issue for bus transportation as tickets terminals and information about lines and routes can be found almost systematically at train stations.

RELATED WORK

This section presents related work separated in two categories. A first one presents works explicitly from the design field, that related in most cases to experimentation and conceptual research in relation to obsolete technologies.

The second section presents services that are or used to be available and supported the use of obsolete devices.

Design experimentations with obsolete technologies

Several approaches to design focus on obsolete technologies, while other could be considered as design with obsolete technologies from an occidental countries, but could be considered as technological innovation from other points of view.

MinitelSe¹⁰ is an open source operating system from the internet of dead things institute that enable the use of old Minitels (french computers from the 80's) in new ways. It is an example of playful diverted use of an obsolete technology. It enables creating a closed network between different Minitels for people to browse internet and exchange information. This repurposing of technologies, adapted to new ways of communicating is a dynamic that is interesting to reflect upon when designing for technologies that are no longer used in the context for which they were designed.

The Cuban 'paquete' (nova, rousshile) is a digital contents physical delivery service which consists in a person who is physically transporting hard drives containing movies, music, and other contents that were not possible to be shared in other ways because of an inexistant or too weak internet network in Cuba in the 80's.

It connects to the project "dead drops"¹¹ by Aram Bartholl consists in USB ports embedded in the city's walls. They become public platforms for sharing files with the other inhabitants of the city. Nonetheless, the Cuban paquete is different in the way that it came up from the necessity of sharing contents in a context that couldn't support the sharing infrastructures that can be used when internet is accessible. Bartholl's work in comparison is more conceptual, and could appear almost absurd in the context it is placed.

The Internet Phone¹² presents a screen-less interface which enables to read internet pages through the use of a rotary phone. Internet pages are accessed by dialing numbers that correspond to urls, found in a book registry provided with the phone. If this project is presented as a critical design, the idea could be taken further from the perspective of access to services, and therefore to be able to make actions on it, to exchange data with an internet page instead of passively "reading" it.



¹⁰ Minitel SE, <http://www.theinternetofdeadthings.com/>



¹¹ Dead drops, Adam Bartholl, 2010 <https://arambartholl.com/dead-drops/>



¹² Internet phone, Isak Frostå, Sebastian Hunkeler, Jens Obel, James Zhou, <https://sbhklr.com/projects/The-Internet-Phone/>

Offline internet services

Google offline

Google, had suppressed in 2015 a service ¹³ which enabled to make google searches through text messages, this service having no purpose anymore for their target users living in majority in developed countries. Nonetheless, this disappearance was detrimental to certain developing countries, where access to such service would be beneficial.

¹³ <https://techcrunch.com/2013/05/12/google-kills-sms-search/?guccounter=1>

Similar services emerged at the time in India, but then migrated to several African and Asian countries when Indian population started being equipped with smartphones.

Offline Internet

Deepak Ravindran in 2013 released a service that responds to the specific context in India where at the time 700 millions of phones in India didn't have internet reception ¹⁴. He proposed the service "offline internet"¹⁵, which enabled to browse the web through text-messages. One year later, the service was no longer needed in India because cheap smartphones penetrated massively the market. The service was then exported to different other countries in southern Asia and in Africa (Pakistan, Sri Lanka, the Philippines, Thailand, Indonesia, Nigeria and Kenya). This service was used as a way to accelerate the internet access to populations that don't have the necessary infrastructure. It is interesting to note how the service was replaced in India as soon as smartphones become accessible to the bigger part of the population. This service is mostly seen as a temporary alternative, and becomes itself obsolete when the country "catches up" with the international norm of technological progress.

¹⁴ <https://www.wired.co.uk/article/offline-internet-is-open-source-innoz>

¹⁵ <https://www.offline-internet.org/>

4884, texting public transportation

The Belgian¹⁶ transportation company delijn proposes to the inhabitants of Brussels to pay their bus or tram tickets by texting 4884 with their phones. The price of the ticket is then added to their phone bill at the end of the month. This functionality is a good example of how a service can be available phones from different generation without distinctions.

¹⁶ <https://www.delijn.be/en/vervoerbewijzen/tickets/>

METHODOLOGY

Approach and methods

Critical approach

My approach to research through design (RtD) in this thesis draws on a critical understanding of the design discipline, and aims to propose alternative views on hegemonic practices, tendencies and understandings of technology. I specifically relied on Daniela Rosner's critical fabulations, which she presents as "ways of telling stories that open new avenues for design by awakening alternative histories" in her book.

In the introduction paragraph of her fourth chapter, she describes further her approach that intends to bring alternatives to dominant ways of conceiving life and technology.

"I explore how scholars might open different possibilities for practice by drawing on the lives, locales, and lineages that contemporary design traditions regularly overlook, a process of critical fabulation."

In this design process, I am particularly interested in challenging universalism and solutionism. The tactics she proposes in that regard: interferences and extensions aim for the first one to recognize the experience of marginalized ones and the second to repurpose design processes as not intending to stop at the design of a prototype that would be the perfect solution to a given situation. In that line, the prototypes produced in this thesis will especially rely on Bardzell et al.'s definition (2015) of design artifacts' capacity to embody the knowledge that has influenced their conception, but also on their capacity to embody critiques to their current state.

Design process

The design process was structured in three parts, which are presented in a chronological order in this thesis manuscript for clarity reasons, but were actually entangled at some levels.

1. The first part was fieldwork and aimed to collect qualitative data such as testimonies and observations on the experience of living with obsolete devices. One angle focused on semi-structured interviews and design probes, given to people who experience or have experienced living with a technology that is not optimal regarding their environment. Another angle focused on the digitalization of public services in Sweden, and involved observation, photo-documentation and user-journey mapping.
2. The second part is prototyping and consisted in two orientations from the case study which explored two aspects of Swedish public services's digitalization: the authentication processes in the public institutions with a focus on public healthcare, and the access to public transportation in cities.

3. The last part is presented in this thesis in the discussion chapter, and corresponds to the analytical perspective on the topic that the design process brought. It is presented as the reflections that occurred, and presents potential contributions to the IxD discipline.

Ethical and societal concerns

In regards to ensuring the respect of the privacy of participants and the compliance to GDPR (General Data Protection Regulation), they all have been informed about what personal information is being used in my project, to whom it might be available, and for how long. The consent of the participants was explicitly voiced, and can be withdrawn at any moment.

I aimed to collect the fewest personal information possible, restricting it to the necessary data. The personal data notes and transcripts from the interviews locally stored on my computer will be deleted on the 05/06/2021.

This project taking place in the context of the coronavirus pandemic, the physical workshops and interviews were conducted only with people who share my household, with the opportunity for digital or outdoors interviews.

DESIGN PROCESS

Fieldwork part 1: Life with obsolete devices

Interviews with dysfunctional devices' users

I conducted semi-structured interviews with people who own dysfunctional objects. Dysfunctional devices were investigated here rather than obsolete ones because the understanding of obsolescence can be very subjective, and it was therefore more meaningful at that stage to explore the decreased functionalities of devices, which are also associated to obsolescence.

Methodology

The interview was structured by but not limited to the following questions:

- What is/was the dysfunction?
- Since when is it dysfunctioning? (or for how long did you use your device while it was dysfunctioning?)
- How is/was it impacting your daily life and the way you use your device?
- Can you give one or several example(s) of difficult situations that your dysfunctioning device had put you in?
- What did you do to adapt to the dysfunction?
- Did people around you (family, friends...) have to adapt as well in some ways?
- Do you / did you want to repair it? Why?
- Did you wait before buying a new one or repairing it? For how long? Why?
- Did you find any beneficial outcome for this experience?

The participants were encouraged to detail their lived experiences precisely through contextual questions. The overall exchange was meant to be dynamic and similar to a conversation.

Practicalities

The interviewees were students from Malmö University, all living in the same student accommodation. The interviews were held in a short time frame (from 10 to 15 minutes), digitally, indoors or outdoors depending on the preference of the interviewee.

Results

I interviewed six participants who have or had various dysfunctions on one or several of the digital devices they own. The different situations were:

- P1: An Ipad that had stopped holding a charge and therefore had to stay plugged for being used, but without reaching 100% of battery. A lot of online services are not functioning anymore as well.
- P2: A laptop that dies when the participant moves it because of the battery. The computer also spontaneously deletes random documents saved on the computer.
- P3: A smartphone with a broken touchscreen that made parts of the screen unaccessible. The battery was also defective. She also lived without a phone for two months because she broke it.
- P4: Lived without any phone for six months in London
- P5: Had a phone on which she couldn't download any applications for one year. As a result, she was never taking the phone with her.
- P6: Her phone broke for a few months when she arrived in Sweden. She also traveled without the possibility to charge her phone.

Living with a dysfunctional device was described as an experience that varied a lot according to the purpose of the initial device.

All participants mentioned having an additional device to fulfil functions that the dysfunctional one couldn't do anymore. For example, P3 uses a burner phone when she is going for a hike in nature because *"it is more robust"*. P1 uses his computer and smartphone instead of his tablet to go on social media, which is bothering him because he used to have a special device for these leisure activities so they do not parasite his daily life. P2 bought a tablet and a keyboard to be able to work in the library as her laptop has become a desktop computer staying in her room.

The economical difficulties of P2 and P3 pushed them into keeping a dysfunctional device and not replacing or repairing it directly. P1 is planning on repairing his tablet but is waiting to get back to his home country to do so. P4 did not want to put the priority on buying a new phone and would rather pay for immediate and mandatory needs as he *"would have had to spend like half of [his] rent on it"*.

P2 and P3 described situations in which they had to use their friend's devices for accessing digital services. P3 for example used google maps through a friend's voice on her burner phone when she was lost in the countryside. P2 only uses her Netflix account on her friend's computers. P3 described that because of being unsure about whether or not she could rely on her phone for the day, she had to make plans with her friends and her family much more in advance. The main inconvenient she found in this experience was being unreachable because *"people expect you to be accessible"*, or as P4 put it, phones tend to be *"so integrated in our life nowadays"*. Nonetheless, she appreciated having a break from social media when she broke her phone, and she didn't really miss it at the time. P5 and P6 as well appreciated this rupture from social media and notifications. P4 stated that he need his phone because it was often

not convenient not to be able to check up information on internet on the spot, P6 said that she would like to live without a smartphone, but she feels like it is not possible because people require her to be available to communicate.

My main takeaway from these interviews of young adults apart from their accounted experiences of living without a last generation device is that they produced tactics and made efforts to readapt to their surroundings. Even though they expressed benefits (mental health, time saving) to the disruption cause by the dysfunction, the necessity of certain fonctionnalités and digital services became more obvious to them because of their disparition. It was also interesting to note that the economical factor was a reoccurring reason of their situation.

Interview with a deliberate obsolete phone user

I interviewed a young adult who has been living without a phone in Sweden for the last four months. Before this, he was owning a burner phone (that he refers to as 'Nokia phone') that got stolen. He was chosen for a short interview as he has an intentional counter-practice of technology in Sweden.

Methodology

The semi-structured interview was focusing on how he manages to live his daily life surrounded by people who own a smartphone and in an environment that requires one.

The interview was framed as a discussion that addressed these different topics:

- The reasons why he doesn't have a smartphone.
- How did he adapt his life compared to when he had a smartphone.
- How are his friends and relatives adapting to the situation.
- What are the main benefits and inconvenients of not having a smartphone in Sweden.
- I suggest him my initial design idea: an access to basic internet services (itineraries, finding information, booking bus tickets) on non-smart phones through text-messages.

Results

The reason why he doesn't have a smartphone is related to addiction issues with technology. He also has blockers on his computer to prevent him from accessing social media. He expressed his satisfaction regarding his life without a smartphone. He is communicating with his friends on Facebook Messenger, and his family through Skype. He is used to plan everything before leaving his home, and he feels like now he and people around him are used to life without phone, his life is not so much more complicated. Nonetheless, he expressed that everything is made for smartphone users, but "*you always find a way*", even

if it is generally *“a bit more complicated and expensive”*. Instead of his phone, he uses external resources, such as computers from public libraries, people in the street for finding his way, or book for being entertained during long trips. He used to have internet on his ‘Nokia phone’, but a very limited amount. He used the browser to find torrent to transfer to his computer, where the blocker he installed doesn’t allow him for downloading such files.

When presented the idea of an internet access through text-messages, he found it very useful, and would definitely use such service as it is not mobilizing attention as much as the way of browsing web on a computer. He specified that he misses having access to Google maps when being out of his home, and would make use of this kind of alternative.

Analysis

The interviewee has made the choice of living without a smartphone and has found different ways for adapting to disadvantaging situations due to this life choice. According to him, the improvements on his mental health worth the complication of his daily life. However, he observed that he faces additional difficulties due to his specific situation in Sweden.

Probes

Description of the experiment

This experiment aimed to explore the process of adaptation when one switches from their contemporary device to an obsolete one. This probe aims to make obvious the change of habits, reconfigurations of the social circle, and new tactics that one can develop when switching to an older device.

The phone

This phone ¹⁷ used to be mine for one year. It is one of the most precious things I own. The participant were aware of this special bond between me and this object, which might have fostered a form of care that might not be occurring with cheap and old devices like this one.

Another important aspect about this phone is its aesthetic qualities¹⁸. It is a flip phone, which when it is closed is shaped like a red sports car. On the car’s front window is equipped with LED’s that display the hour when a back wheel is pressed, or during an incoming call. The sound design is also very flamboyant, as the non-adjustable speaker is emitting sounds of a car starting up, car keys and car motor for most of the interactions that are required to use the phone.

This exuberant phone is regularly taken in picture, filmed by people. More than just a phone, it sparks discussions between the owner and other people.

Methodology

Both participants were interviewed before the beginning of the experiment about their habits concerning their phones, they were also interviewed



¹⁷ The flip phone given to participant 2 for the experiment

¹⁸ Similar models were exposed in an exhibition that intended to valorize the audacity of such designs over the monotonous conventional design of touch-screen smartphones. <http://disnovation.org/shanzhai.php>

during the experiment on a daily basis to track the different changes that occurred in their lives. A final interview was conducted when they were given their phones back. During the first days of the experiments, I was in observation with them and documented this phase with contextual photographs ^{19, 20, 21, 22, 23, 23, 25, 26, 27}.

The participants were chosen according to their important smartphone use for online activities.

P1: The participant was chosen for the following reasons:

- She has a significant phone and internet consumption: according to her phone's data, she spends approximately 4 hours a day on her phone. All her activities on her phone are internet related.
- She is very social, and therefore the fact that she might not be answering to messages directly might have an impact on her social circle.
- Her phone contract includes 10 text messages and one hour of calls per month.

She preferred not having any phone than being given a burner phone because *"if there is no internet on it, I am not going to use it anyways"*. She agreed on taking the experiment for 4 days, but finally extended the experiment for two more days on the third day of the experiment.

P2: She volunteered for doing this experiment when she heard from the experiment with P1. She initially liked the aesthetical qualities of the burner phone, and agreed on living with it for a week. Her main motivation here in this experiment was to experience a disconnection from her social media. She saw it like a challenge to herself. She relies mainly on whatsapp for communicating with her friends, but also uses instagram and snapchat frequently (several times a day). She had an physical appointment to make during the week, which was challenging to her as it was the first time she would go to the location.



²² P2 took 41 pictures with the flip phones during the week of the experiment. She was used to take pictures with her smartphone to help her remember what she has done with her day later.

Results

Both of the participants seen this experience as a digital detox. They both



¹⁹ Another person (from an older generation) helps participant 2 to figure out how to add contacts in the phone.

P2: *"Now it is older people who are explaining to me how to use a phone"*



²⁰ A friend of P2 taking a photo of the flip phone's screen with his smartphone in order to capture a photo of himself that was taken with the phone.



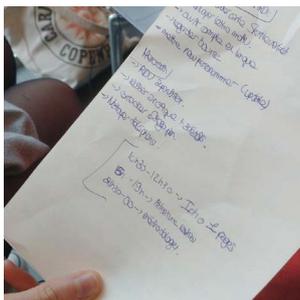
²¹ Participant 2 entering her contacts in the flip phone. It took her about half an hour to enter 10 contacts.

want to continue not using their phones at some moments in their days (“*keeping it in my room when I’m in the kitchen*”, “*going to the library without it*”). Both of them wanted to take distance from Instagram in particular.

At the beginning of the experiment, they realized how addicted they were of their phones (reflexes of checking their phone constantly, feeling of loss, boredom).

During the experiment, they both expressed the fear of missing out something from what their friends would be doing or saying of group messages. P2 had issues at the supermarket, where she couldn’t look up for the translation of an aliment that she was looking for as Swedish is not her native language. She finally decided to ask a person who was next to her at the supermarket for using google translate on their phone. P2 also had an issue when going back from an appointment. It started snowing a lot while she was in her meeting, and when she had to go back home she couldn’t take a bus for going back home because the timetables are not displayed at the bus stops.

Both changed their way of planning before leaving their home. They wrote lists and maps on paper, they planned beforehand calls they had to make, and most generally they tried not to be alone to much if they were going outside, especially P1 who didn’t have any phone.



²⁷ On the left: P1 makes TODO lists on paper so she doesn't forget what she has to do.

On the right: P1 making a grocery list on a piece of paper.



²³ Translation: “Anaëlle, can I borrow your phone to make a call??”

P1 sent me this message because she had an important call to make.



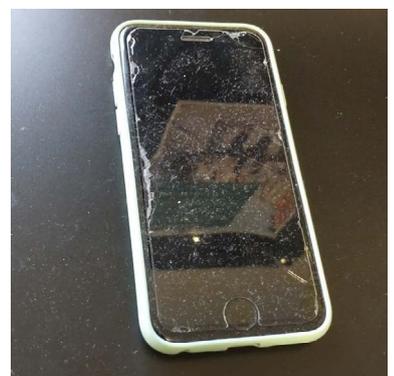
²⁴ P1 playing the game Snake on P2's phone because she was bored from not having her phone to distract her.



²⁵ Similarly, P1 was trying to keep her hands busy by any means, here by playing with a lighter.

Analysis

The results of this experiment should be replaced in their context: living one week without a smartphone will only get them experience a glimpse of what living without a smartphone is. They both arranged their week so they wouldn’t be in uncomfortable situations, postponed social activities and important calls and meetings. This reconfiguration on their daily life informs us about the mandatory aspect of smartphones in young adult’s lives. This experience was lived as a playful challenge by the participants, while on a longer period the results might not have been the same.



²⁶ P2's phone at the end of the experiment, covered with dust.

Synthesis on fieldwork part 1

Similarities emerged from the three interviews and the probe experiment presented. The first one is the profiles of the participants: all were young adults and foreign students. Therefore, they fall out of the statistics previously described in the case study chapter. Nonetheless, elements correlate with factors that could lead to marginalization:

- About the half of the interviewees who own a dysfunctional device mentioned economic reasons for postponing the purchase of a new device.
- The interviewee who lives without a phone explains having adapted to the situation, but sees it as a tradeoff because of the benefit he perceives from not having a smartphone. In other terms, if he was not trying to solve addiction issues, maybe paying more for bus tickets life would bother him more.
- The participants from the probe experiment reorganized their life so they would not have to make important activities (important appointments, meetings) the week of the experiment.

The interviewees and the participants generally had the privilege of perceiving the experience of not having a smartphone as a 'digital detox'. However, except for the interviewee who chose to live his life without a smartphone, they made the choice to buy a new device as soon as they could because of the constraints that their life without the device implied.

This led me to the concern of people who would not have the choice of living with an obsolete electronic device, and therefore being affected by the constraints of an environment thought for others and not for them without having the possibility to take action on it.

For that reason, I shifted the orientation of my project towards the democratic access to technology in Sweden, taking as a foundation the constraining situations observed during this first part of fieldwork.

I am aware of the fact that the publics I encountered during this fieldwork are much different from the actual marginalized groups I would be designing for. Further research would be required in close collaboration with such publics in order to sharpen the services proposed and get a precise understanding about the practices of the various profiles included in the vast designation of 'marginalized groups'.

Fieldwork : Skåne's public services

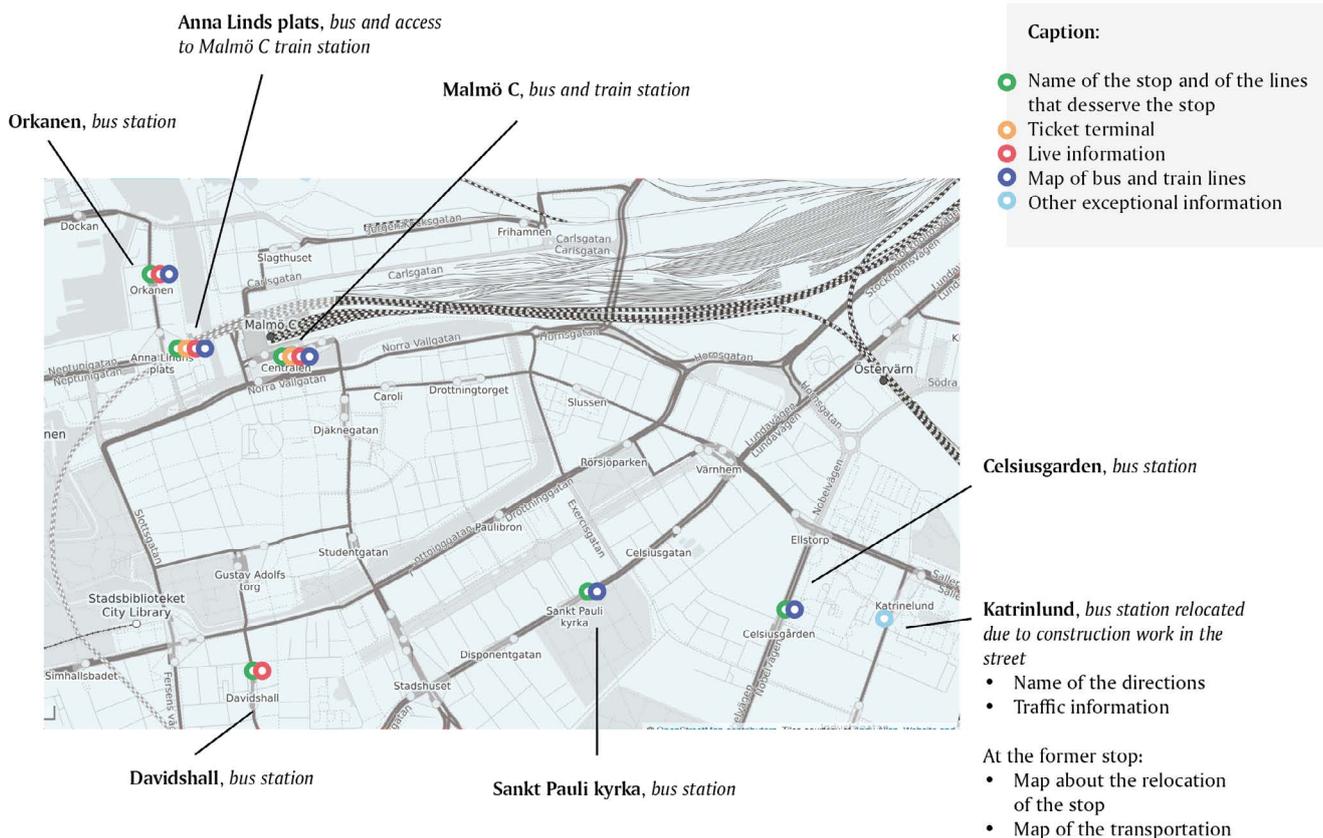
The context of the coronavirus pandemic is a way to project more computerization of public services. Less in-person interactions, relying more on online services.

Observation, photo documentary: Skånetrafiken Malmö

In order to observe the existing infrastructure of public transportation, in Malmö, I chose to take a trip in the city to observe which information was available for users who don't have a phone with internet access.

I visited five bus stations and one train station where a terminal for buying tickets was located ²⁸.

I present in the next section the different information accessible at bus stops, through contextual pictures taken during the field observation, as well as a map for contextualizing the observations.



²⁸ Mapping of the distribution of the accessible information at bus stops in Malmö

The different information observed:

1. Name of station and lines accessible at the stop²⁹

This information combined with a map is relevant for a person to find connection with other lines, and to build more complex routes. The information about the lines also shows the direction of the buses, which gives an orientation to the map as well. It is also important to know which stop to take when there is no map around.



²⁹ Two different bus stops pannels in Malmö

2. Ticket terminals

Tickets terminals are found at train stations. See appendix 1 for the pictures of the screen interface where it is possible to purchase tickets and refill the transportation card.

3. Live data about the next buses stopping at the station³⁰

The live traffic data has two types of display. One is more analogue and consists of a list of the next buses that will deserve the stop. The waiting time and direction of the buses are displayed. The other display is a screen and contains a data visualisation of the waiting time before the next bus.



³⁰ Live schedules display terminals in Malmö

4. Map of transportation ³¹

The map of transportation was the same at all stops. It presents all the lines of buses and trains that go through the city and its suburbs.



³¹ The map of transportation is the same at every stop of the city.

5. Other exceptional information ³²

One stop was subject to construction works and therefore did not have the line numbers written at the stop. The original stop was located twenty meters away, and would contain this information as well as a map of the street showing the new location of the stop.



³² Temporary sign at a station in construction works

Results

The main observation is that the information is inconsistent. The information found at each stop is generally different, and becomes less detailed as we get far from the city center, except for big stops near for example a shopping centre.

I didn't find any bus schedules at the stops in order to know the planning of each line (they can be found online).

Calling experiment: Sweden without BankID

This experiment aimed to explore the journey that one person who cannot use a bankID has to go through when trying to accomplish common tasks in

two different Swedish public services: the Swedish tax agency and the health care system.

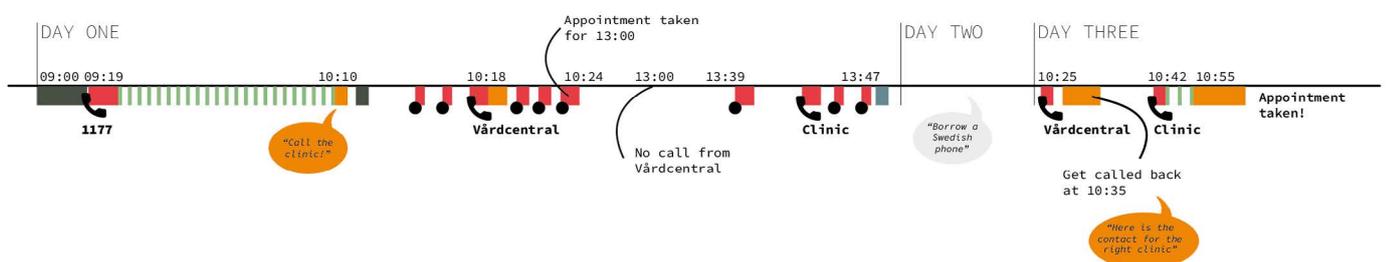
Being a foreigner in Sweden, I didn't have a bankID at the time of this experiment, and therefore, I chose to try to accomplish two tasks that I had been postponing until I would get a mobile bankID (which in my case took months). One of these tasks would get me confronted to the healthcare system, as I needed to get a blood sampling appointment. The other task was to contact Skatteverket to get very specific information on an administrative formality that I was completing at the time.

To get through the different steps, I mostly relied on information available on official websites, but also the empirical knowledge of my Swedish and international friends who know the best practices to deal with the tricky situation that being a foreigner in Sweden represents.

Health care: Getting an appointment for blood sampling

This journey was very challenging³³ because I had to make an appointment, but also to know where I had to make it. It took me three days in total. I talked to three different interlocutors from 1177, Vårdcentral and a clinic. Nonetheless, when I was stuck because I couldn't reach any service, a friend gave me the advice to borrow a phone from a Swedish friend to be able to get called back by Vårdcentral.

Getting an appointment for blood sampling



³³ Mapping of my journey for getting an appointment for blood sampling

Tax agency: Getting information about the status of my Swedish ID card order

I made this call about one week after the ones for the healthcare. After 10 minutes on the IVR, I understood that I would exceed my phone contact's limits and decided to give up on the call³⁴. Another option for me would have been to call at different times of the day when the waiting time is shorter.

I didn't put as much energy into it as in the first one because I preferred having someone who was going to the office physically to ask the question for me.

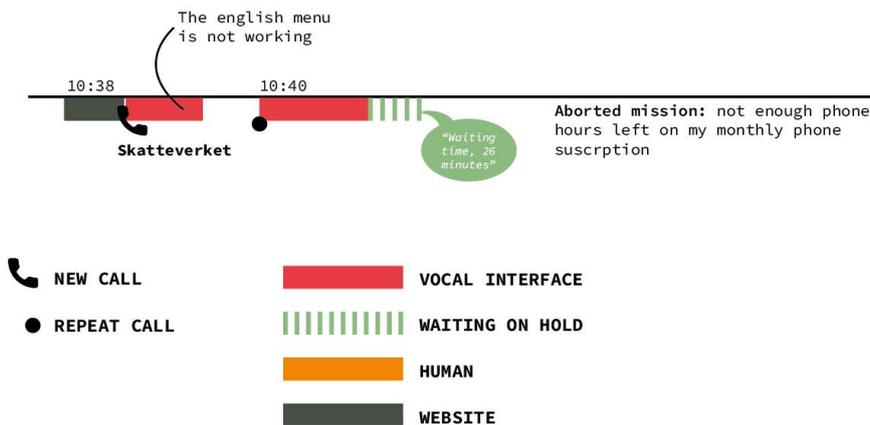
Results

The experiment revealed that getting in contact with public services without owning a BankID relies on interacting mainly with IVR's (Interactive Voice response). The choice of this technology can be questionable, as it is mostly used in the industry for customer service as a way of reducing costs for the companies by trying to get the customers to get their answers by themselves

when they call for help. The Swedish public services' IVRs have some specific functionalities that make the experience more enjoyable, which I would recognize here as good designs.

They propose phone appointments. When I called my local Vårdcentral, the waiting time was few hours long, and waiting on hold is unpleasant. Getting a time slot and getting called back is a good way of not making the person feel like they are wasting their time.

Getting information about the status of my Swedish ID card order



³⁴ Mapping of my journey for getting information from Skatteverket

The menus that list the different options are quite clear, and not too long.

Another very interesting option is that you are asked to fill in your personal information like your personnummer directly on the phone. It made me feel like I was actually making something useful and saving some time for when I would reach a human.

Nonetheless, I could experience several disappointments that in the end, made me give up on one task.

First, being confronted with artificial voice only means that if your case is very specific and doesn't fit into the pre-established frame, it becomes impossible to access the service. This is a real issue here because phone calls are supposed to be the last resort solution for people with particular situations (not having a bankID, but also not having a personnummer, or being a foreigner who doesn't understand Swedish). For example, I could not get called back by Vårdcentral because my phone number was not Swedish.

I mentioned before the call-back system that can be very convenient, but waiting on hold is used on 1177, and the waiting time can be quite long (for me 40 minutes). During this time, a voice is repeating that the operators are doing everything they can to make the waiting time shorter, and updated me about my position in the queue. If this is obviously inconvenient as it is not possible to get our full attention on something else during that time, I realized that this system could become very problematic for people who have a limited amount of phone calls in their phone contract. Indeed, a lot of phone contracts propose a limited amount of call time. This was the case of P1 in the

probe experiment, but also mine during this fieldwork experiment. As I waited 40 minutes on hold for the 1177 number, I couldn't wait for 26 minutes for getting to talk to someone at Skatteverket, as I am limited to 1 hour of calls per month by my phone operator.

I also had to call several times the same numbers, and it was frustrating to have to go through the entire menu every time while I remembered the full combination of numbers that got me to the right menu.

Finally, the biggest problem that I identified with the healthcare services and that correlates with the experience of the blogger described in the case study section is that once I managed to reach a service, I was redirected to another one (which was not always the good one). Finding my way through the different options and numbers was not easy, and I never knew if the time I was spending on hold or exploring the IVR's menus was worth it.

Prototyping

To explore different approaches of design of public services for obsolete devices' users, I prototyped two proposals that rely on the observations made during my fieldwork with the following Swedish public services:

- Access to Swedish healthcare system

A specific scenario for this prototype is making an appointment when the person doesn't have access to a BankID.

- Access to public transportation

A specific scenario for this prototype looking up for an itinerary

Access to public transportation: Text-message-based city transportation service

I sketched two design proposals that aim to support offline phone users in their daily life. Both rely on the same technology: accessing online contents through text messages.

1. Malmö assistant

The first prototype focuses on access to situated public services requiring an internet connection. The prototype is based on two situations identified during the fieldwork:

- In Malmö, the schedule and public transportation map is not available at every station. This results in difficulties to find which transportation to take to go somewhere with autonomy.
- Physical maps in the city are very rare, resulting in more difficulties in finding directions without external help.

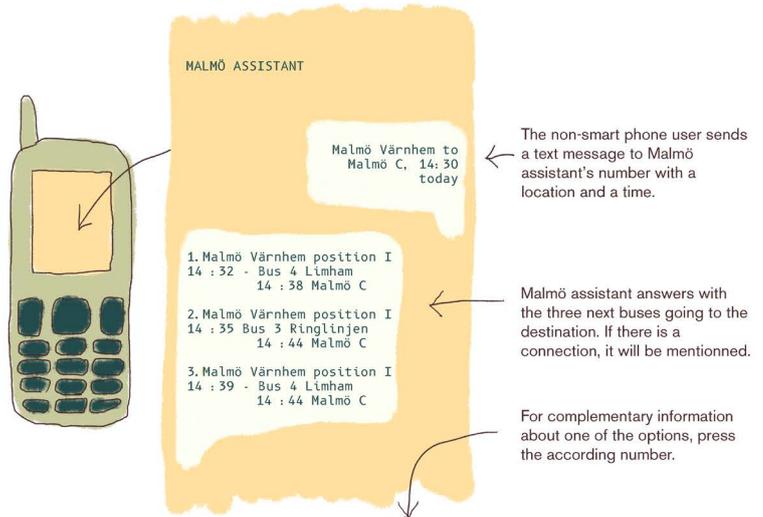
The first design proposed could be related to a public service offered by

the city of Malmö. It consists in a conversational interface accessed via text messages. The user can search and find real-time information by sending a text message to a specific number associated with the city's service here called 'Malmö assistant'. When a request is sent via text, it is transferred to a server that browses a data bank. The content is then organized into a text-message and sent back to the user. The two scenarios³⁵ were sketched in the same format: an initial situation where a required information is not accessible without internet access is illustrated on the left side of the sketch, and an example of a conversation with 'Malmö assistant' is sketched on the right.

MALMÖ ASSISTANT

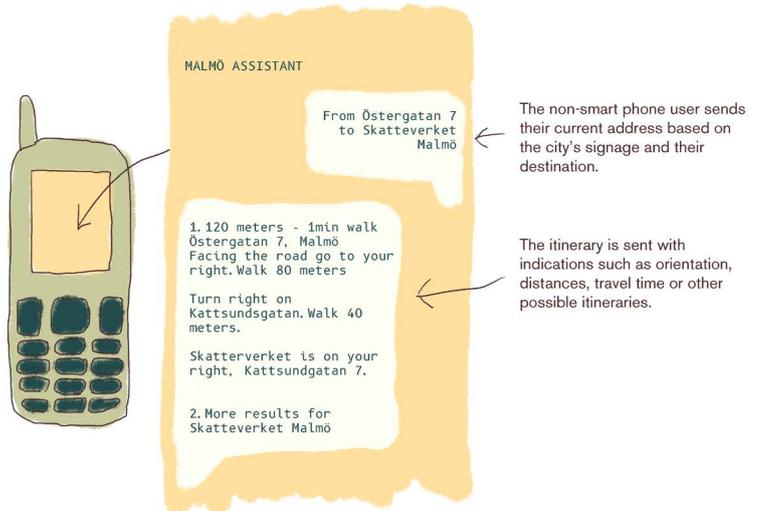
Situation one

No schedule at the bus stop



Situation two

No physical map



³⁵ Two scenarios of use with Malmö assistant

2. Planning receipt

The second prototype focuses on the outcome of the interviews and probes, bringing to light a specific organization required to spend a day without a smartphone when the social environment expects everyone to have internet access.

It consists in an interface enabling to plan different aspects of daily life, and to centralize handy information in one place. The information was divided in three categories:

- ‘Permanent information’ relates to information that might be useful every day to the person. Examples of this could be: contact information (phone number and address) of close friends, relatives and colleagues or frequently visited locations addresses and phone contacts.
- ‘Meetings and appointments’ stand for the different persons and establishments that are supposed to be visited during the day.
- ‘Locations and itineraries’ are the information related to places that should be visited during the day, and the itineraries that would be taken.

Once this information completed on the computer-based interface, a ‘receipt’ is sent via text message to the user. It is folded into different categories that can be accessed by typing in numbers associated with different entries in order to access more precise content.

The sketch is structured in two parts³⁶. The left part is a low-fidelity wire-frame of the computer interface, with an example of the type of information that could be entered during the planning session. The right part is an example of text messages that could be exchanged between the user and the service during the day.

PLANNING RECEIPT

Planning interface

Collecting and organizing the different information required for the day without needing internet

Meetings and appointments

Meetings Import from contacts

Steve +46
Address

Vanessa +46
Address

NEW MEETING

Appointments Import from calendar

Vardcentral +46
14h30
Address Send location

Swedbank +46
09046
Address Send location

Lisa +46
51830
Address Send location

NEW APPOINTMENT

Locations and itineraries

Locations

ADD A LOCATION

Swedbank +46
Address

Malmö University +46
Address

Vardcentral +46
Address

Itineraries

15 minutes, Biking
From Home
Ostergatan 7, Malmö
Facing the road go to your right. Walk 60 meters
To Swedbank
Turn right on Kattsundsgatan. Walk 40 meters.
Skattenverket is on your right, Kattsundsgatan 7.

NEW ITINERARY

SEND PREVIEW

Permanent information

SMS receipt

A synthesis of all the selected information is sent by text message.

PLANNING RECEIPT

Planning receipt 12/04/21

1. Permanent information

Today's meetings:

2. Steve

3. Vanessa

Today's appointments:

4. Vardcentral

5. Swedbank

[...]

Vardcentral
14h30
+46*****
Address

4

³⁶ Sketch of the planning receipt

Analysis

These two examples present advantages over situated static information (in situ maps and schedules) as they can provide real-time data, and tailored itineraries. Nonetheless, the city should be accessible also to people with no phone at all as they exist as well. It is important to acknowledge the diversity of publics instead of reducing services to one category of users.

Iterations

I pushed my prototyping in two directions, corresponding to two challenges regarding technological evolution disparities in Sweden: the access to public transportation.

Text-message-based Skånetrafiken

Based on my observation of the public transportation infrastructure in Malmö, I chose to dive into ways for citizens who don't have access to Skånetrafiken application to be able to:

- Find their way in the city, and be able to make meaningful choices regarding their mode of transportation.
- Being able to buy a ticket on the spot, without necessarily having to plan their trip beforehand.

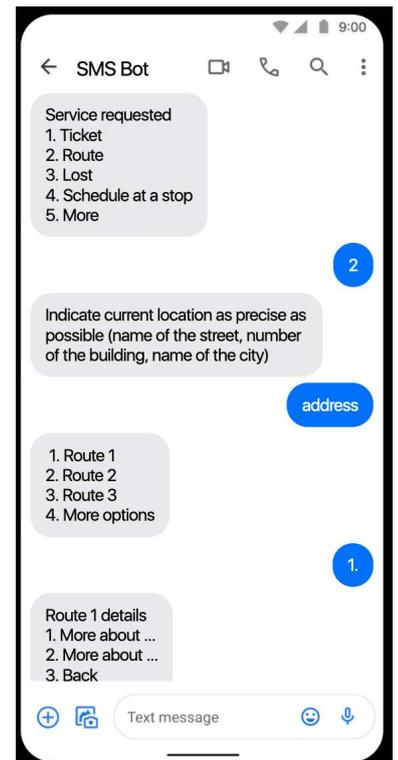
I am specifically focusing on the city buses infrastructure, as there is often a lack of information there that could allow the users to choose a route.

First prototype on Botsociety

I prototyped a first outline of the service, based on conventional text-message interactions on Botsociety³⁷, a conversational interfaces tool that allows to create paths of written conversations and preview them on a message interface.

The initial goal was to guide the user through the different services available, and then propose concise answers that can be detailed on request. This allows keeping messages short, and therefore making the experience quicker. Indeed, it was not possible to expect users to type a lot of characters because some of them might not have a convenient keyboard. I voluntarily avoided bringing an Artificial Intelligence in the service because if it could have allowed for more functionalities, it could have made the service heavier, slower and potentially less clear. Nonetheless, an IA might be necessary for the address recognition, especially if there are typos.

I based the design of the conversation on my analysis of a typical user journey on the Skånetrafiken website (the analysis can be found in appendix 2).



³⁷ Screenshot of the animated interface prototyped on Botsociety

Testing

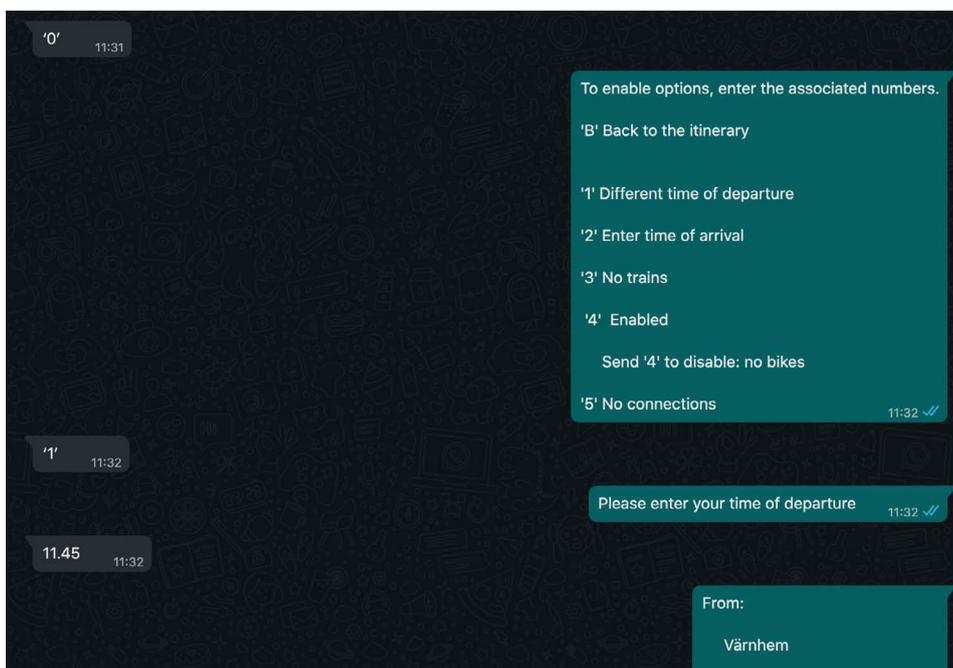
This animated prototype was shown to two participants, who were quickly interviewed about the clarity of the conversation they could observe. Both of them found the general system clear, and the purpose of the service relevant. Some iterations were implemented based on their remarks such as making the numbers look like options and not like a numbered list, or ordering information in different ways. Both of them wondered about how precise the service would be to orient them for walking to a stop, and wondered which level of precision the service would give.

Wizard of Oz testing

I have conducted a test experiment in which I proposed a text-message-based Skånetrafiken service to a participant living in Malmö. In this experiment, we communicated through Whatsapp because it was more convenient for her, and the primary goal of it was to test the clarity of the conversation ³⁸.

The prototype was not technically functioning, as no server was involved in the experiment. I was in some sort the server during the conversation we had together through the message application.

I used the tree-structure presented in Appendix 3 as a template to fill in the information corresponding to the participant's route. At the end of the experiment, I asked the participant to text me a short feedback about how she felt about the experiment, and what was laborious or unuseful about it.



³⁸ Screenshot of the Wizard of Oz experiment with the participant.

Results

You will find the entire conversation in Appendix 4.

Globally, the interaction was fluid, even when I made a mistake as a server (I didn't pick the route from the time she indicated me at the beginning), she asked for another route with the appropriate command.

Some particularly interesting comments from her were:

- *“With this service I don't know why I'm getting this specific route. Is it the fastest? Is it the first available bus?”*

By default, the route given is the next route available, but it was not made clear for users.

- *“Is it a service from A to B (could be anything) or from station to station?”*
She was unsure about if she could use the service for itineraries that do not involve public transportation (by foot or bike).
- She thought that the options were pretty unclear, and wished that she would have been more aware of them so she could really customize her trip according to her preferences.
- She also wanted an option to be updated about her journey if the bus is late for example.

Layout and challenges

The conversational part of the service works quite well, and was easy to understand by the participants as it is already known by them. Restructurations would have to happen on the different options and functionalities proposed by the service to enable the customization of the route.

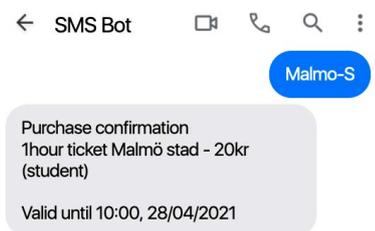
A major challenge is the compromise between the detail level of information and the size of the screen of some phones that might make long texts hard to read³⁹.

Shortcuts⁴⁰ are inspired by the practices of texting concisely with small keyboards. The intent is to provide users with a meaningful combination of characters to make themselves understood from the service.

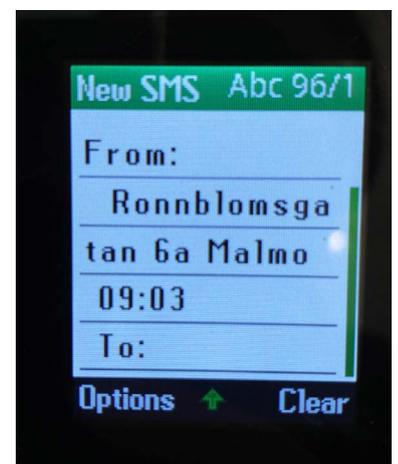
The constraints inherent to obsolete technologies mean having less ability to type long texts and therefore as people used to adapt to it with new orthograph, we could imagine new practices in the use of obsolete devices in such infrastructure.

Sketch of the infrastructure

I mapped on the next page the different actors and exchanges that the service would foster⁴¹.



³⁹ *Shortcut for a ticket purchase via the service.*

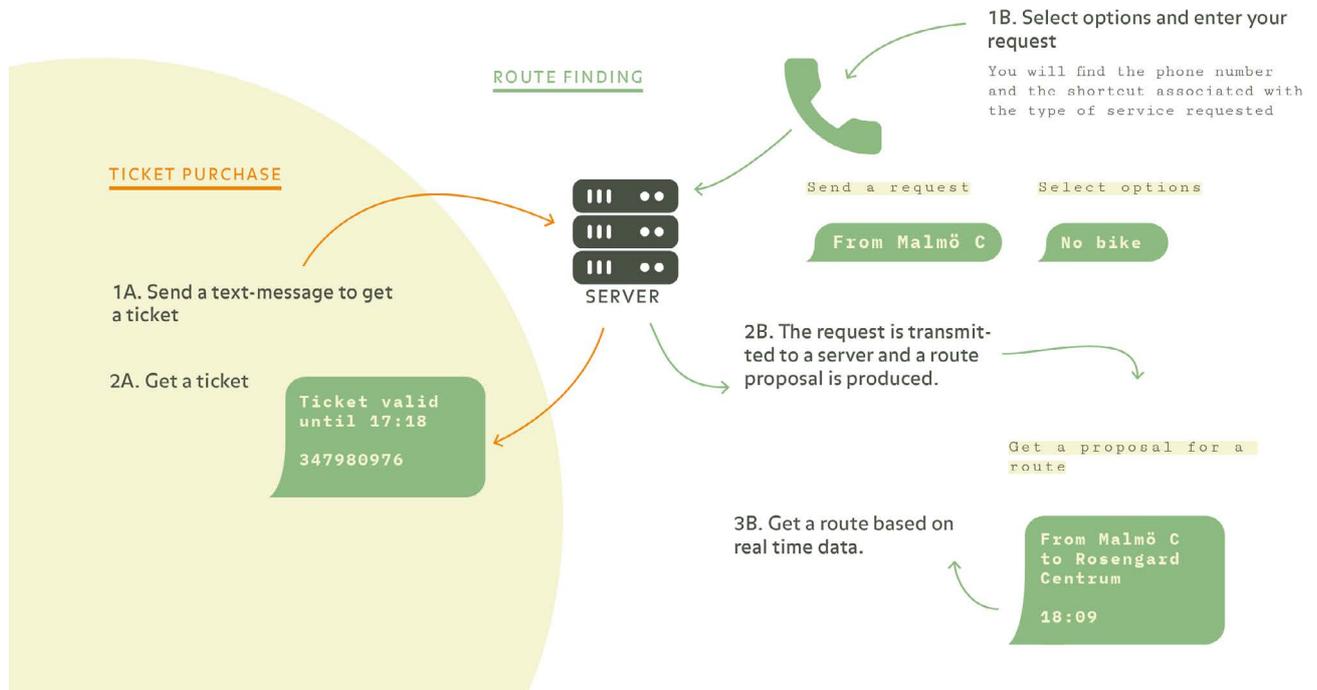


⁴⁰ *Test on a small screen to have a glimpse of how many characters can be displayed on one screen.*

Public transportation service

GENERAL MENU

Get oriented through a conversation-based interface, or get directly the information by writing a shortcut.



⁴¹ Mapping of the infrastructure of the text-message-based transportation service

Access to Swedish healthcare system: an authentication system for patients without BankID

I came up during my fieldwork with several constraints which I tried to overcome. The biggest challenge concerning the user experience was the time spent on the service and the frustration that comes with communicating with an artificial voice.

Another important aspect of the prototyping will be reflecting upon authentication processes. Indeed, the BankID technology enables one to prove their identity remotely in a secure way. When dealing with personal and medical information, the question of privacy and security is important.

Redesigning the user journey with the IVR

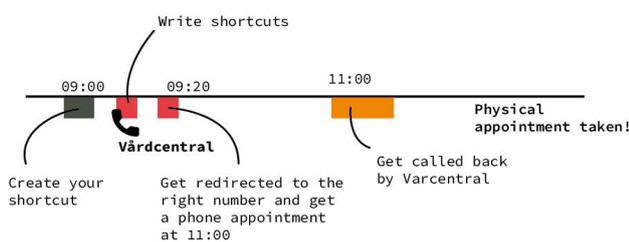
From the three sketches^{9, 33, 34} made from the current experience that one can have from being in contact with trying to make an appointment or getting information from the Swedish healthcare system, I proposed new user journeys that would make the experience with calling for making appointments in the Swedish healthcare shorter and easier⁴².

Some existing functionalities in the vocal interfaces have been reused, such as the ability to be called back when the waiting time is long.

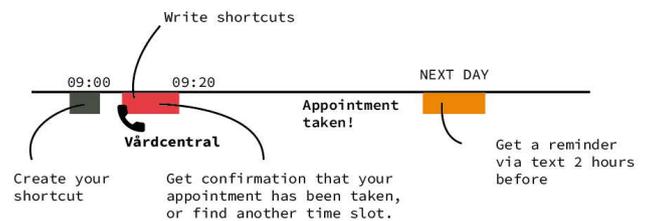
I sketched three different user journeys based on different tasks:

1. Making a phone appointment: getting called back by a nurse or an agent to get information or book an appointment.
2. Being directed to the right service and therefore avoid calling several numbers until getting at the right service.
3. Booking a physical appointment at a healthcare facility without having to wait to talk to someone.

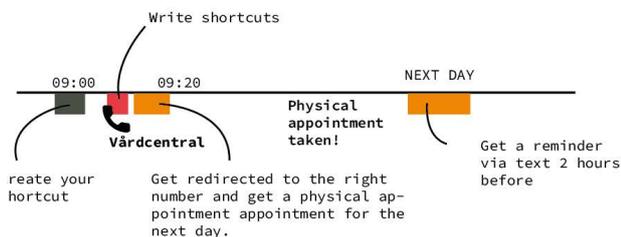
Getting a phone appointment



Making an appointment on your own



Getting redirected to the right service



⁴² Ideal user journey - "happy paths"

A new functionality that was added is the possibility to create 'shortcuts', which are a combination of numbers that one can type on their phone to access directly the right submenu or functionality without having to listen to all the options on the IVR.

The idea here is that to reduce the time spend on the vocal interface.

The information structure of the service

I divided the shortcut's construction according to three different types of information:

1. **Personal information.** This relates to identification numbers, but also to languages spoken or the phone number to get called back.

2. **Service requested.** This relates to the orientation of the person through the different healthcare services available. The gravity of symptoms or the type of health facility requested could be criteria that would orient the patient in the different services.
3. **Type of action.** This related to what the person wants to do when in contact with the said service. Possibilities could be talking to someone to get advice or book an appointment.

The sketch below⁴³ illustrates the different layers of information that are requested during a classic call to healthcare services in Malmö. The three categories will be reused as a structure for my prototype. The elements with a black contour are options that could be added to the existing service. The different information proposed in the “service requested” category could fluctuate according to the different healthcare services proposed to the population.

⁴³ Categorization of the different layers of information requested when calling Sweden healthcare

The shortcut would correspond to a code that summarizes the different information selected.

The phonebook

The phonebook⁴⁴ is a registry of shortcuts delivered to new inhabitants of the city when they move in, but can also be found at the different offices of public services. It would contain the different phone numbers that could be useful for anyone living in the city.

More than a phone numbers repository, it would give access to different functionalities that will help them navigate through the different services. It also provides an access to booking appointment securely without needing a BankID, and therefore without encryption that requires owning a computer or a mobile phone.

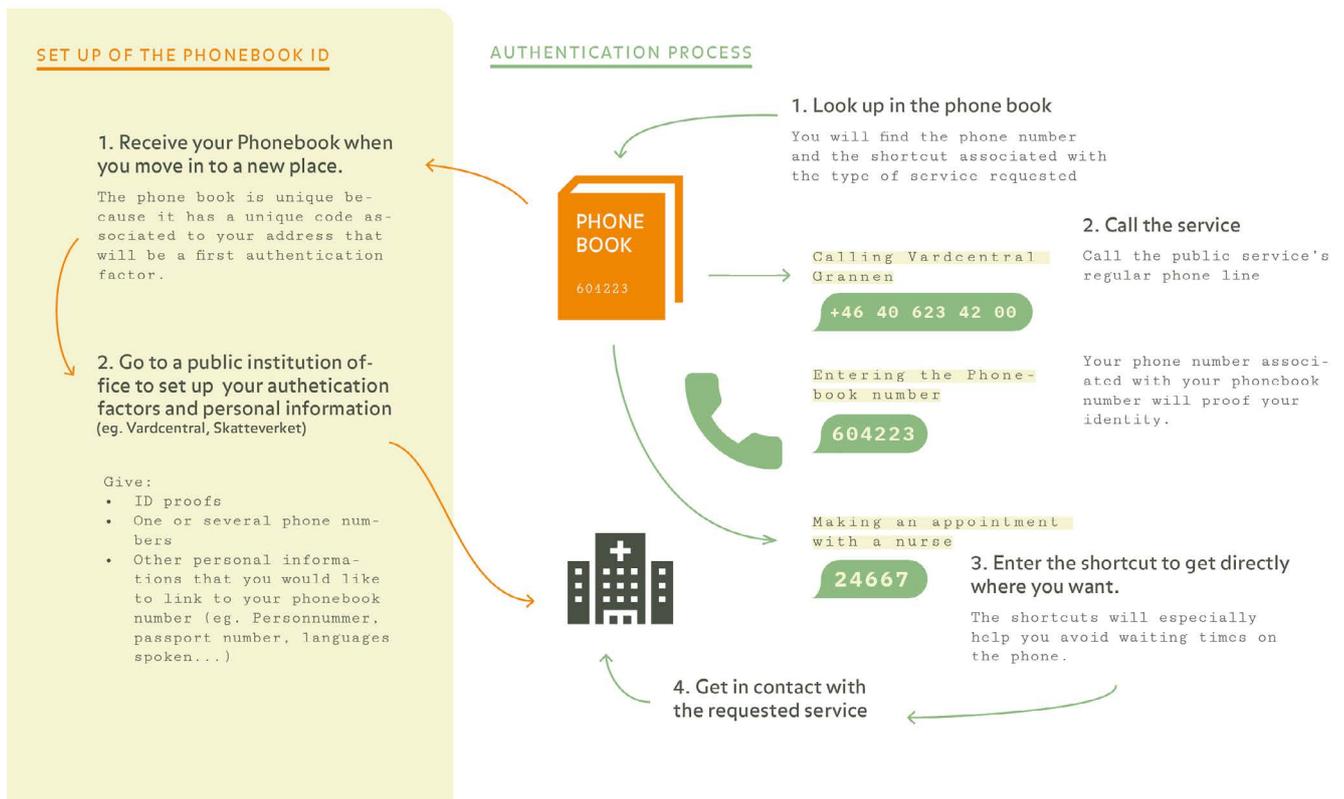


⁴⁴ Mockup of a potential design of the phonebook's frontpage

Sketch of the infrastructure of the service

The encryption process is described on the sketch below ⁴⁵.

Authentication process with the Phonebook



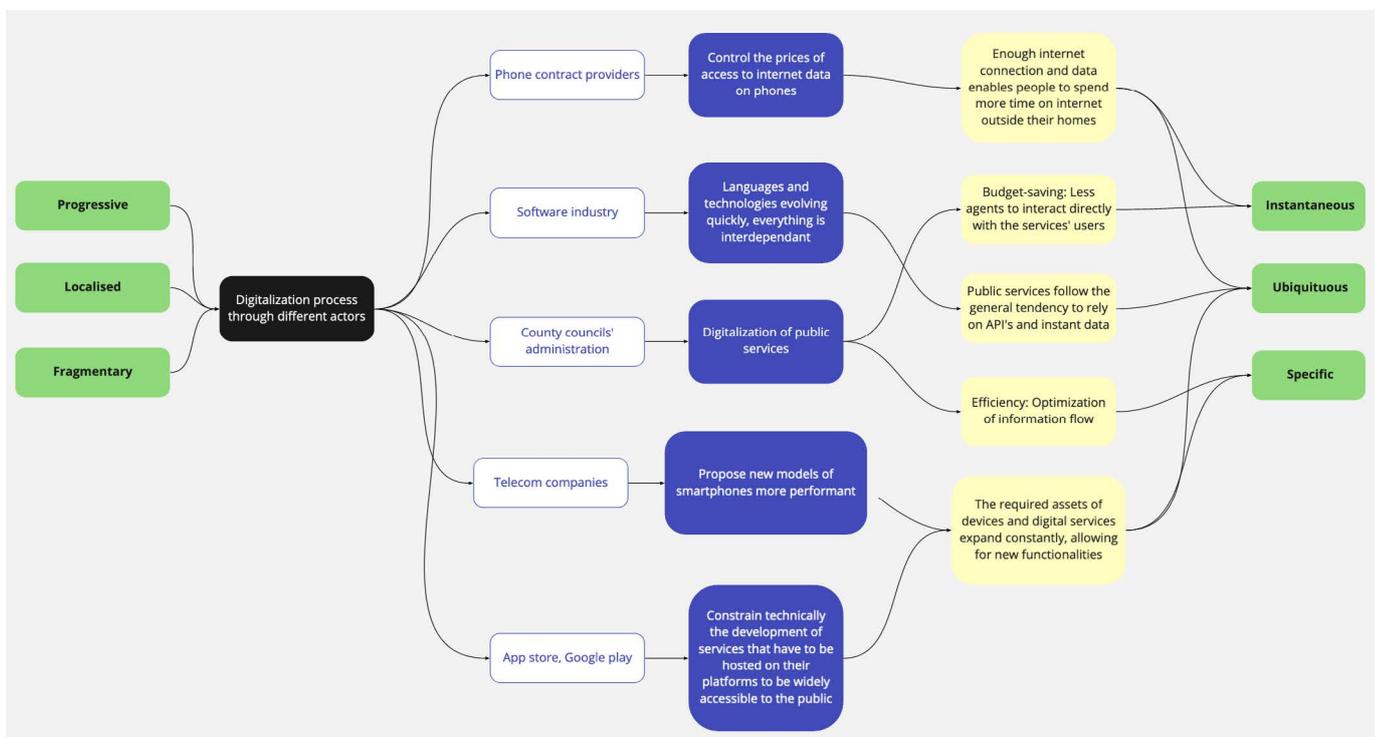
⁴⁵ Sketch of the authentication process with the Phonebook.

DISCUSSION

The process of obsolescence

The two prototypes inform on the complexity of the network of actors that contribute to the ageing of devices, technologies or practices. It is important to acknowledge them, as designing for obsolete devices doesn't mean reproducing what used to be in the past. The context around public services and the different actors is central to understand how obsolescence is produced in public services.

I mapped my analysis into a diagram⁴⁶ of the digitalization process of the two examples from my case study: Skånetrafiken public transportation service and BankID as an authentication secure system used in public healthcare and tax agency.



⁴⁶ Mapping of three different trajectories of digitalization

I propose 3 trajectories that represent the evolution of the experience of public services through their digitalization process. The categories are based on Scott McQuire's (2020) trajectories (ubiquity, positionality, real-time) of how the new media impacts public spaces and culture. I rephrased the positionality and real-time trajectories into specific and instantaneous because they made more sense regarding my prototypes. I also added a second word for each of the trajectories in order to give an idea of interactions with public services before their digitalization, compared to what tendencies are emerging now.

- From Progressive to Instantaneous

The trajectory taken here is going towards less time and efforts required to make an action, and the availability of the service all the time (eg. Skånetrafik-

en proposes live data about the delays of the transportation system, and offer to visualize the current position of buses and trains in the lines).

- From Localized to Ubiquitous

The trajectory taken is going towards the availability of the service everywhere, as opposed to having to go to a specific location to accomplish tasks (eg. buying a ticket). It also related to the necessity of having access to the service for different contexts (eg. BankID allows access to health care but also to other administrative tasks).

- From Fragmentary to Specific

The trajectory taken here is the accumulation of information collected and distributed. The data provided by a service like Skånetrafiken is richer, and the data centralized with BankIDs allows for very specific identification of individuals.

This global view on the different actors impacting and impacted by digitalization reveal other potential design opportunities. Future work for engaging with obsolescence on a systemic level could be to tackle the computerization of jobs induced by the implementation of such applications.

Strategies for designing for obsolete devices' users

The two prototypes aim to explore ways of integrating obsolete technologies' users in public services which in their process of digitalization tend to marginalize groups of citizens. It is also a critique of the alignment of public services on the innovation standards that emerge from the technology industry. The design of public services at the era of their computerization faces several challenges such as accessibility, national sovereignty, privacy or public budget.

The two public services studied show well the obsolescence processes from which they depend, but also on which they actively impact.

The angle taken in this work was to propose ways for different generations of devices to coexist by integrating older devices to more recent services. It is a logic of inclusion that tries to adapt the new services to this lack of accessibility.

The information display and exchange is a big part of the two prototypes, as the navigation through contents and functions had to be adapted to the constraints of other technologies: small phone screen, a limited number of characters, voice interface.

The prototypes also propose advanced features for the most expert users who have used the service several times. 'Shortcuts' were proposed in both prototypes as ways to fluidify the navigation through the different steps of a service; for accessing a right menu or for the configuration of an itinerary.

The downfall of implementing an add-on to existing public services could

be that the plurality of options might complexify the structure of the services, which would complicate the access to them.

Agency of public institutions over obsolescence

The designs presented in this thesis recontextualise obsolete devices regarding public services. Through the prototypes, I propose that the accelerating obsolescence can be tackled by the public services, in the way the infrastructures are designed. Choosing to support older devices and other system versions goes beyond a design choice: it is a political choice that will impact at a wider scale in the society: Who will be employed? Who will struggle to access the service and who won't? Who will have to make significant financial or cognitive efforts to be able to access the service?

Public institutions have the power to normalize uses at a big scale because they somehow impose ways of doing to citizens: unlike private services, you have to get in contact with your public institutions at some point, you can't just choose another service that works better for you.

The Swedish state-funded platform 'Smart city Sweden' states clearly a preoccupation for the accessibility to digitalized public services, manifested more explicitly as a matter of user-centeredness⁴⁷ rather than questioning the digitalization itself. Such discourse could be pushed further by the Swedish public institutions in integrating obsolete technologies as an inherent part of digitalization, as the digitalized services will produce obsolescence. Proposing a better service for all as opposed to for the many could be a judicious political position to defend.

⁴⁷ "The digital services under development are to be user-friendly so that they do not risk increasing inequality for different groups in society."

<https://smartcitysweden.com/global-goals/industry-innovation-infrastructure/>

Another take on technological innovation

This thesis argues for re-placement instead of replacement of objects that seem not to be useful anymore. It is an apprehension that contrasts with the usual tendency of innovation to go towards "the new". The main argument of this thesis lies in the compatibility of the services designed with older devices, but the topic could be enlarged to the perspective of compatibility with practices or knowledges that could be considered obsolete.

To be sustainable, innovation cannot seek to replace existing technological devices and practices, as this achievement would be an illusion, but also because of the impacts of radical innovation on communities and the environment.

Designing with the obsolete

Design is about making new things, having ideas, it is strongly related to innovation. Interaction design specifically is very attached to exploring the potentials of emerging technologies. However, designers could challenge the assessment from the technology industry of what is up-to-date and what is too old to be used by being mindful of the reality of the life experienced by people

who might definitely not be 'up-to-date' from the perspective of the devices they own.

Designing with obsolescence processes in mind means designing with the wider concerns that a project encompasses. Future work in this direction could explore further the obsolescence processes in different fields where design has agency.

CONCLUSION

This thesis presented the development of two prototypes that embody ways of integrating better obsolete devices in Swedish public services. These prototypes bring a critical light on how public services are being designed and which dynamics are impacting their development. Rather than finished prototypes that would be ready to implement, they aim to initiate directions for future implementations that would take in consideration so considered “obsolete” devices as being still in use by citizens, and having a deeper reflection on digitalization processes proceeding in public institutions.

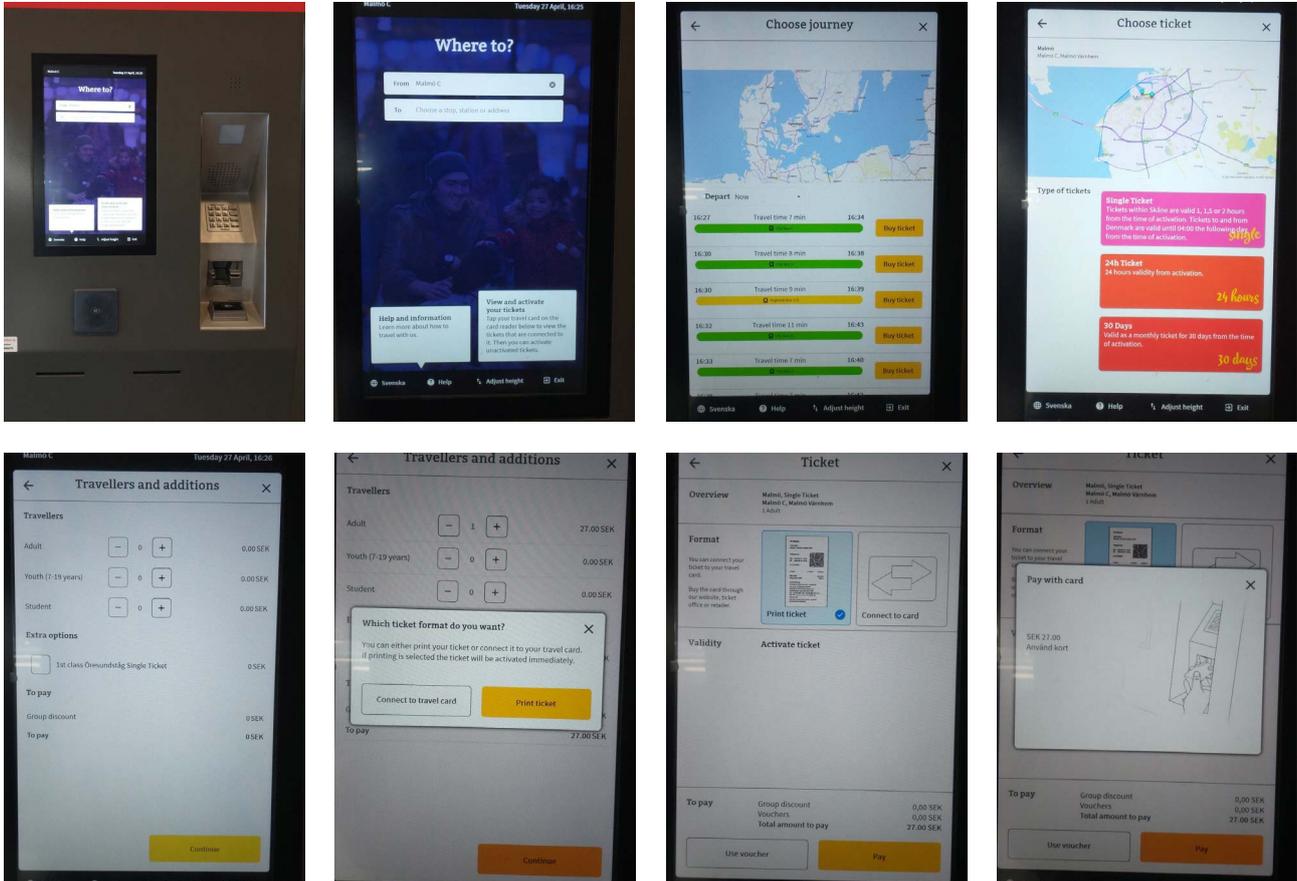
The prototypes propose subtle modifications to the existing public infrastructures that the shift to more inclusiveness smoother. This re-wiring of public services echoes ‘circuit-bending’ practices, this time used as a practice for adapting digitalized services to older devices instead of adapting obsolete technologies to their contemporary environment.

My designs propose new directions for the design of public services that would rely on another understanding of the lifespan of objects, but also on the acknowledgement of the difficulties that digitalization can cause for marginalized groups.

This work opens out the spectrum of fully functional devices and “dead devices”. It nuances the ideal vision of objects that is marketed by the industry by acknowledging the dysfunctionalities that are part of the life of products.

APPENDIX

Appendix 1: Ticket purchase interface on the terminal at Malmö C



The pictures above represent the different steps and screens that one has to go through when purchasing a transportation ticket. It is very similar to the application on mobile phones. The difference is that it is possible to print the ticket or to charge it on a transportation card.

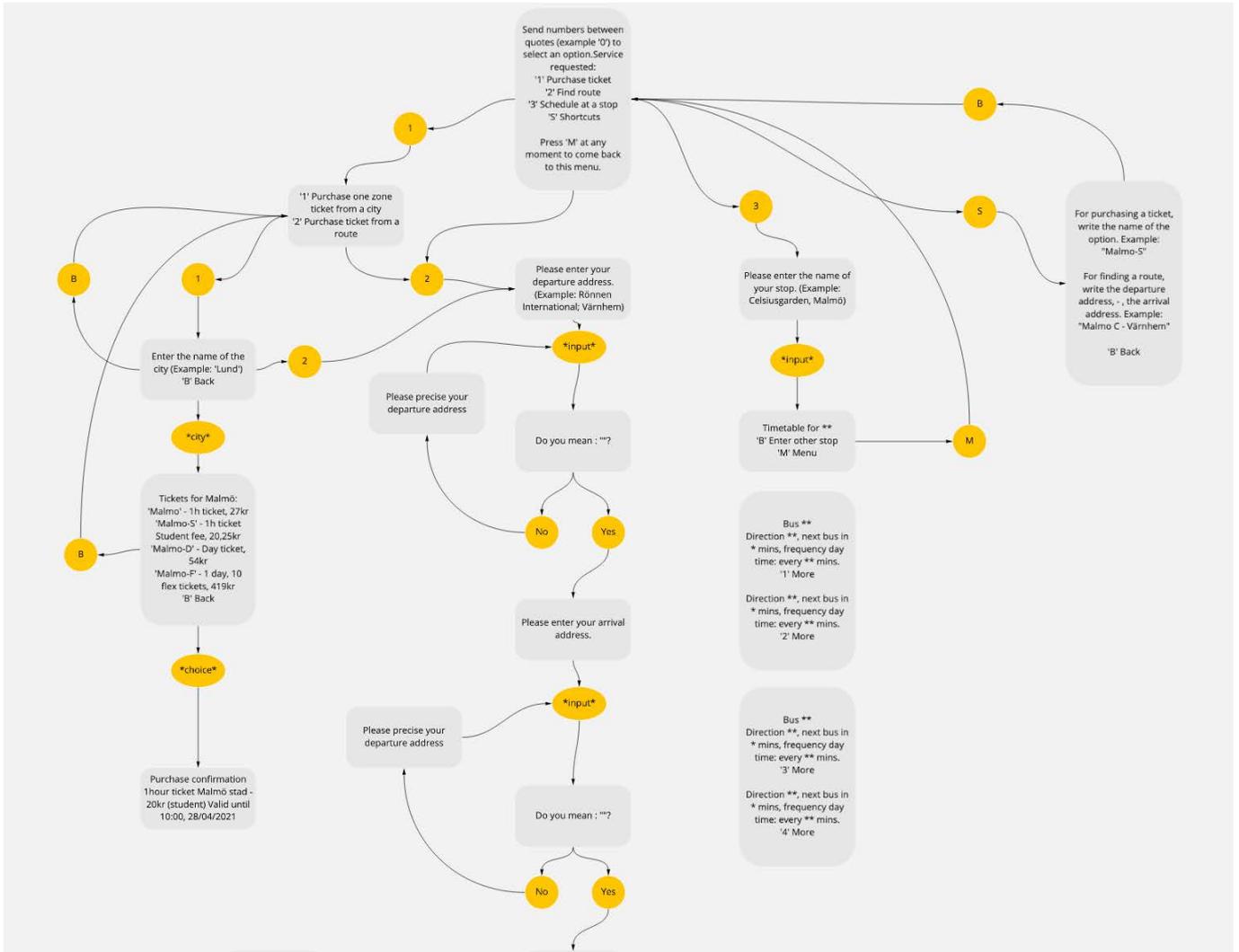
Appendix 2: User journey for finding a route on Skantrafiken's website

I analysed the different information available at different steps of building an itinerary on Skantrafiken's website. I organized it in three main steps in a table.

| | | |
|---|--|--|
| | | |
| <p>1. Type information in</p> <ul style="list-style-type: none"> - where you leave - Where you want to arrive - When | <p>2. Get the next routes available</p> <ul style="list-style-type: none"> - ranked by departure time - Time of departure and arrival - duration of the trip - Option for more information - Number of connections | <p>3. Get route details</p> <ul style="list-style-type: none"> - number of meters from A to B point - Name of the different stops, lines taken, directions. - Times at each step - Price of a ticket |
| <p>Insights</p> <ul style="list-style-type: none"> - The "when" could be in option, by default, the user will get the soonest option | <p>Insights</p> <ul style="list-style-type: none"> - No need for duration if you have the time of departure and arrival - Connections could be written only if there is one. - Include 2 mins more for the person to finish interacting with the service before leaving - Need the name of the buses taken | <p>Insights</p> <ul style="list-style-type: none"> - A map or itinerary for going to the stop is missing - Be able to buy a ticket from there - |

Appendix 3: Tree structure of the paths for the text-message-based public transportation service

After a few iterations based on the feedback of two users who were shown the animated version of the Botsociety prototype. The different messages were thought so the answers would be as short as possible, and the number of messages to get the right information would be as few as possible.



Appendix 4: User feedback from the Wizard of Oz testing on Whatsapp

Here is the totality of the feedback received from the participant:

"- The first menu is very clear, there aren't a lot of options at this stage and it's nice to think "oh hey I can work with this". But during the first time using the service, I don't know what options 'shortcuts' would give me, or why I should need that option (In hindsight, I should have asked you)

- About the arrival address: I tried to be pretty specific, but I didn't know much was needed. It asks for the address, but could that be any address or would a specific bus station be better? So the question is: Is it a service from A to B (could be anything) or from station to station?

- If it is a service from A to B and I want to go to specific address, usually there are multiple options and depending on what I prefer at that moment, I would choose something. So on a rainy day I would maybe look for a route with the least amount of walking (doesn't matter if the total journey takes much longer), if I'm in a hurry then I just want the fastest, if I feel like walking a bit more then I would go for that option, etc. Also if I go from A to B and it's not just a super short journey, you usually have to take multiple buses. For example, it takes 45 minutes but I have to get on 3 different busses. If there is also an option to only take 1 bus, but it will take 55 minutes in total, then my needs that day decide which option I would take.

With this service I don't know why I'm getting this specific route. Is it the fastest? Is it the first available bus? Is it one with the least amount of buses? So I would love know why I'm getting that route. Why was that route 'the best'? And can I choose a different route based on a different need? On the other hand, it's nice to not having to choose a lot all the time. So what I think I would like is insight in the 'default' option. For example that it says that this is the fastest route. And then when I think 'hey no actually I don't want the fastest one today, I prefer one that involves the least amount of buses and waiting time in between', THEN I would select 'R' Find a different route.

- Right now I am not tempted to go to '0' for more options because I am not aware of what those options might be because it's the first time I'm using it. Now I know that actually the option '5' No connections is under '0', but I wouldn't know that otherwise. It would be nice to have those options before I get my itinerary. Maybe an extra message between my arrival address and the 'understood, please wait...' message or something? Like a confirmation of what I entered and then the option to confirm that or to select more options.

- (this is again if it's a from A to B thing and not station to station): I didn't get insights into how far I had to walk. I choose Värnhem as my departure station and if it's a bigger station like that, sometimes the 'position' the bus leaves from is a bit further away. For example, if you have to go from the middle of the station to Position I, it might take you 3 minutes or more (depending on the traffic and if you have to cross the street

etc.). And from the arrival station to the actual location also takes a little bit.

- There is a general schedule the buses follow, but in reality sometimes buses are late, early (hate that haha) or they don't come at all. I would love an option to keep updated on my selected journey! So that I get a message if for example suddenly that bus isn't coming anymore.

- I think in general the messages itself are also very clear! The only time it was less easy to read was the one for the tickets. It would have been easier if the different options were all listed under each other, instead of on the same line. I had to look carefully to see which price was connected to which ticket. I also see that I just said Day ticket instead of 'Malmo-D'."

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