RETHINKING LAST MILE PARCEL DELIVERY TO PROMOTE END-CUSTOMER WELL-BEING IN RESIDENTIAL AREAS

Viimase miili pakiveo ümber mõtestamine elamurajooni lõppkliendi heaolu edendamiseks

MASTER THESIS

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Tallinn 2022

(On the reverse side of title page)

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THESIS TASK

Student: Lisett Mitendorf, 204666MADM

Study programme   MADM10/18, Design and Technology Futures

Main speciality: Design

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Thesis topic:

English   Rethinking last mile parcel delivery to promote end-customer well-being in residential areas

Estonian   Viimase miili pakiveo ümber mõtestamine elamurajooni lõppkliendi heaolu edendamiseks

Thesis main objectives:

1. Understand and analyse last mile parcel delivery, human well-being, and their relations.

2. Explore ways to promote customer well-being through last mile parcel delivery.

3. Design a solution that provides last mile parcel delivery while supporting customer well-being.

Thesis tasks and time schedule:

No	Task description	Deadline
1.	Literature review	31.03.22
2.	Analysis and design research	16.04.22
3.	Concept design	30.04.22

Language: English   **Deadline for submission of thesis:** 23.05.2022

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ABSTRACT

E-commerce and the resulting volume of parcel have grown greatly, and as a result, solving last mile parcel logistics has become more relevant. Due to the large volume, the workload of couriers has increased, and the existing solutions are no longer sufficient. The technological solutions being developed help to solve the growing volume and make the last mile parcel logistics service convenient and easy for the customer. With a few clicks, the desired products are ordered and in a few days the goods are delivered behind the door. However, this raises a new issue, people are becoming more stationary and there is no need to go out. As a result, the need for socialization and active lifestyle can be reduced, which can affect human well-being and can make people more closed and passive.

Several design research methods have been used to explore the hypothesis. Interviews have been conducted with potential customers, employees of companies that use the parcel logistics service, and employees of parcel logistics companies. To prepare the solution offer, two co-design workshops have been conducted with the residents of the residential area to gather their input to create a user-centric solution.

The master's thesis offers a design concept that makes last mile parcel logistics a natural part of a social and active lifestyle. The solution includes a physical environment and a digital platform for residential residents. The physical environment is a hub in the middle of a residential area, where residents can spend their leisure time and interact with people from the neighbourhood, and at the same time offers storage for ordered parcels. Residents can send the ordered parcels to the hub and choose a suitable time to pick up the parcel. The digital platform supports the functions of the physical hub, provides access to the hub, and manages the last mile parcel logistics service system. In addition, the digital platform provides communication forums for the residents of the residential area and for wider district, together with the local government, to mediate important information and enable discussions between the residents and the local government. To promote physical well-being, the platform includes monthly personal and community challenges to motivate people to live more active lifestyle.

EESTIKEELNE KOKKUVÕTE

E-kaubandus ning sellest tulenev pakilogistika maht on suuresti kasvanud ning selle tulemusena on muutunud aktuaalsemaks viimase miili pakilogistika lahendamine. Suure mahu tõttu on suurenenud kullerite töökoormus ning olemasolevad lahendused ei ole enam piisavad. Arendatavad tehnoloogilised lahendused aitavad lahendada kasvavat mahtu ning muudavad viimase miili pakilogistika teenuse kliendile mugavamaks ning lihtsamaks. Mõne klikiga on soovitud tooted tellitud ning paari päevaga on tellitud kaup ukse taga. See tõstatab aga uue probleemi, inimesed on muutunud üha paiksemaks ning puudub vajadus kodust välja liikumiseks. Selle tulemusena võib väheneda vajadus sotsialiseerumiseks ning aktiivseks elustiiliks, mis mõjutab inimeste heaolu ning võib muuta inimesed kinnisemaks ja passiivsemaks.

Hüpoteesi uurimiseks on kasutatud mitmeid disaini uurimismeetodeid. Läbi on viidud intervjuusid potentsiaalsete klientidega, ettevõtete töötajatega, kes kasutavad pakilogistika teenust, ning pakilogistika ettevõtete töötajatega. Lahenduspakkumise koostamiseks on viidud läbi kaks töötuba elamurajooni elanikega, et koguda nende sisendit kasutajakeskse lahenduse loomiseks.

Magistritöö pakub lahenduseks disaini kontsepti, mis muudab viimase miili pakilogistika sotsiaalse ning aktiivse elustiili loomulikuks osaks. Lahendus hõlmab endas füüsilist keskkonda ning digitaalset platvormi elamurajooni elanikele. Füüsiline keskkond on keskus elamurajooni keskel, kus elanikel on võimalik vaba aega veeta ja naabruskonna inimestega suhelda ning samal ajal pakub keskus ka tellitud pakkide hoiustamist. Elanikel on võimalik tellitud pakid saata keskusesse ning valida endale sobiv aeg pakile järgi minemiseks. Digitaalne platvorm toetab füüsilise keskuse funktsioone, võimaldab keskusele ligipääsu ning haldab viimase miili pakilogistika teenuse süsteemi. Lisaks sellele on digitaalses platvormis suhtlusfoorumid elamurajooni elanikele ning laiemale kogukonnale koos kohaliku omavalitsusega, et vahendada olulist informatsiooni ning võimaldada diskussioone elanike ja kohaliku omavalitsuse vahel. Füüsilise heaolu edendamiseks on platvormis igakuised personaalsed ja kogukondlikud väljakutsed, läbi mille motiveerida inimesi elama aktiivsemat elustiili.

CONTENTS

1. INTRODUCTION

Consumption is an integral part of our lifestyle. Over time, different opportunities have emerged for how to consume and how to procure in what way. In addition to growing or making things yourself and providing from physical stores, digital commerce has emerged that allows to get everything that is needed for life with just a few clicks.

How we consume is greatly influenced by ourselves, but external influences also play a role. In recent years and with the pandemic, many people have been forced to get used to e-commerce. While this may not have been the preferred option, it has become an integral part of consumption.

Along with e-commerce, parcel logistics and various ways of delivering goods to consumers have also developed. While speed and affordability have been some of the most important aspects to this step, it is important to understand what added value could be brought through this consumption process.

Well-being is one of the most important aspects of feeling good and being satisfied with life. By taking care of personal well-being, it is possible to contribute to the well-being of others and influence the people around. To achieve this, it is important to find ways to take care of personal well-being through daily activities.

This thesis explores the opportunities how to prosper well-being through parcel delivery. It does that through the lens of end-costumer and through the last mile parcel delivery, which is the last step of the parcel delivery process where the customer comes into contact with the service.

Everybody has the freedom to choose how they consume and what ways they use for it. Everyone also has the freedom to choose who they interact with and how they take care of their well-being. As e-commerce has become a natural part of the human consumption chain, it is one possible step through which people can be given the opportunity to strengthen their well-being as well.

2. METHODOLOGY

2.1.   Choosing the topic

When starting with my dissertation, I knew that I would like to take a closer look at the parcel delivery system and find a topic of work in this area. Although ordering goods from online has been in a steady growth trend for years, volumes have grown exponentially since the arrival of the Covid pandemic. As a result, rethinking the parcel delivery system has become a very topical issue and therefore gained my interest as well.

When I took a closer look at the whole system, I was most interested in parcel delivery for the last mile, as I, as a consumer, am also most exposed to this stage. This is the most important step in the whole process, because at this stage the end-customer is exposed to the service, from whose experience the demand of the whole system depends.

Also, due to the development of technology and the course of the pandemic, people's daily lifestyle has changed a lot. People have become more stationary, working in home office is preferred, and the need to go out has minimised. As a result, lifestyles have become more inactive, and socialisation has largely moved to social media. The shift in lifestyles caught my interest and raised the question of how our lifestyles and the changes that come with it should change so that people's well-being does not suffer in the process.

2.2.   Design method

I decided to guide my work through the process using constructive design research method. In 'The Role of Hypothesis in Constructive Design Research' Bang, Krogh, Ludvigsen, and Markussen offer a constructive design research technique that allows designers to develop knowledge based on the abilities and capacities of the design field itself. Constructive design research, according to the authors, has no particular structure or linearity. A research project might be developed out of a well-articulated research question, but it can also be developed out of pure experimentation with no apparent goal or strategy.[1]

The study proposes a paradigm for constructive design research that allows not only for the categorisation of methodologies and approaches, but also for the framing and reframing of actual research work. The model depicts a constant reframing of the research activities. The paper consciously introduces a hierarchy within the constructive design research process, with the development of a hypothesis taking place on the foundation of a clear motivation, followed by the formulation of a narrower research question and the identification and application of evaluation criteria. After fulfilling the evaluation criteria, new knowledge can be reliably distributed from the research. The primacy of the experiment as the driving force in constructive design research may qualify each step in this hierarchy and can provide tangible items or experimental design proposals as a kind of knowledge.[1]

In the Figure 1. the process of this thesis is visualised through constructive design research model.

Figure 1. Constructive design research model. Figure made by the author.

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2.3. Design research

Literature research

To understand the whole parcel delivery system and well-being in depth I worked through relevant literature. I mainly focused on scientific literature and articles when selecting sources. As parcel delivery has rapidly changed in recent years and new technological solutions are expected in the near future, websites where stakeholders share their experience and knowledge in this field also had to be used as sources.

Interviews

Interviews with customers, businesses and logistics company employees have been conducted to validate the problems from the theoretical research in the last mile delivery and to find out problems that the companies or customers have experienced themselves.

The list of interviewees and the conclusions are brought in Appendix 1.

Co-Design Workshops

Co-design workshops are a space for creative collaboration. Its goal is to get stakeholders involved in the early stages of a design process. Users are seen as passive objects of study in the traditional sense, with the researcher bringing knowledge from theories and developing further knowledge through observation and interviews. The designer then receives this information in the form of a report and adds a knowledge of technology as well as the creative thinking required to produce ideas, concepts, and other items. [2]

In co-design, however, the roles are reversed: the person who will be served through the design process is given the title of 'expert of his or her expertise,' and is heavily involved in knowledge creation, idea generating, and concept development. The researcher assists the 'expert of his/her experience' in developing insights by offering instruments for ideation and expression. [2]

Two co-design workshops have been conducted to involve the customers in the design process. The aim of the first workshop was to understand what the most important aspects of last mile parcel delivery to customers are. Through this workshop,

information was gathered on the end-customer's expectations and needs, which can be used to formulate the design concept.

The aim of the second workshop was to introduce customers to the design brief based on their previous input and to give customers the opportunity to be part of the solution creation process. Instead of validating the finished concept in the workshop, I decided to involve customers in the design process to take their input into account as much as possible.

3. THEORETICAL FRAMEWORK

A brief overview of the topic is brought out in this chapter. The theoretical framework helps to gather information for mapping the problem space and to formulate a hypothesis, as a result of which it is possible to reach possible solutions.

3.1. Parcel delivery

The process of delivering a parcel to a pre-determined location is known as parcel delivery. A parcel is best described as a package of products that is wrapped in paper or sealed in an envelope and delivered by road, rail, air, or sea.[3]

The origins of parcel delivery as we know it today may be traced back to a time when messages had to be carried to the receiver by hand. To deliver the message personally, the message carrier had to travel all the way to the receiver. It was feasible to a point where the distances were only a day's walk apart. Above that, a system was needed to send the message from one location to another.[4]

Originally, mailing a letter or parcel was a public service, but as time has passed, a private sector has been introduced to the public service with the goal of offering a service that is as quick and economical as possible. As a result, the market has evolved to the point where users choose to use private providers over governmental services due to their faster service and often lower prices. [4] The system of the parcel logistics system can be seen on Figure 2.
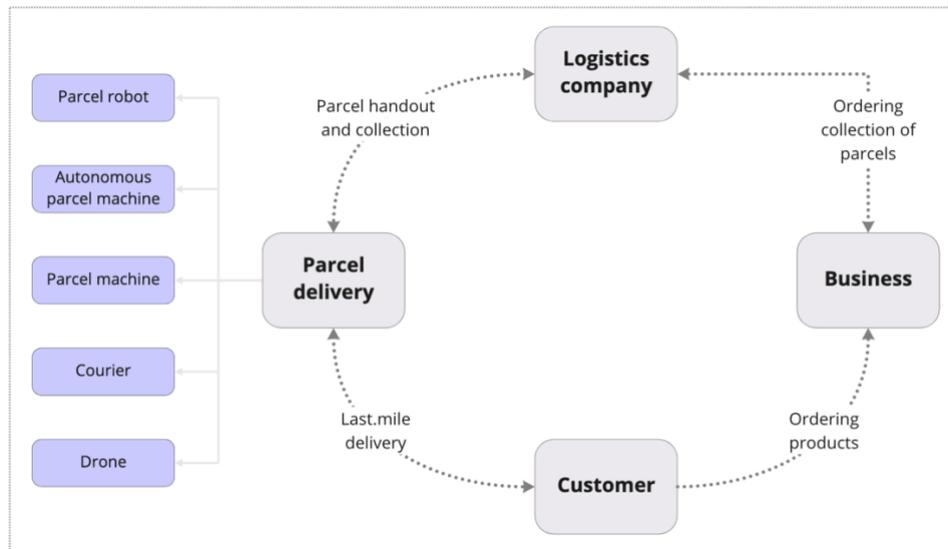
Figure 2. Parcel logistics system. Figure made by the author.

Aside from the advancement of parcel delivery options, the methods for obtaining the required products have also evolved significantly. Previously, you had to physically go to the store, select the appropriate things, and carry them with you. E-commerce, which is seeing rapid expansion, is a growing trend in modern buying. Rather than spending time driving to the store, you may get everything you need online from the comfort of your own home, and the shipment will be delivered directly to your door within days. E-commerce and parcel delivery are inextricably linked, and an increase in one means an increase in the other. Bigger online sales numbers also mean a heavier burden on parcel transport. [Appendix 1]

In addition to this, the e-commerce and logistics markets have been affected by a Covid pandemic in recent years, which has significantly increased the volume of e-commerce and parcel delivery. Instead of being in contact with a lot of strangers' people prefer to stay at home and avoid unnecessary contacts. [5, Appendix 1]

Retailers can contact more consumers, extend much further in the distribution chain, and maximize their resources thanks to the Internet. Customers may engage in the service encounter at any time and from any location, and they can effortlessly compare various offerings. Driven by customers, the e-commerce surge stems from the final leg of the supply chain: the last mile where the order placement and the service encounter occur.[6]

Due to all the above, parcel logistics is facing a situation where volumes are increasing very fast and existing solutions need to be rethought.

3.1.1.   Delivery process

The whole process of sending a parcel starts with the fact that someone needs to send the goods to someone who is not able to pick up the goods themselves. This may be due to the distance from the sender of the parcel or the convenience of the service provider to bring the parcel as close to you as possible. At today's fast pace of life, planning for time and using it wisely has become increasingly important. Therefore, customers prefer to use delivery services for all parcels no matter how close the parcel is coming from. The main steps of parcel delivery process can be seen on Figure 3.
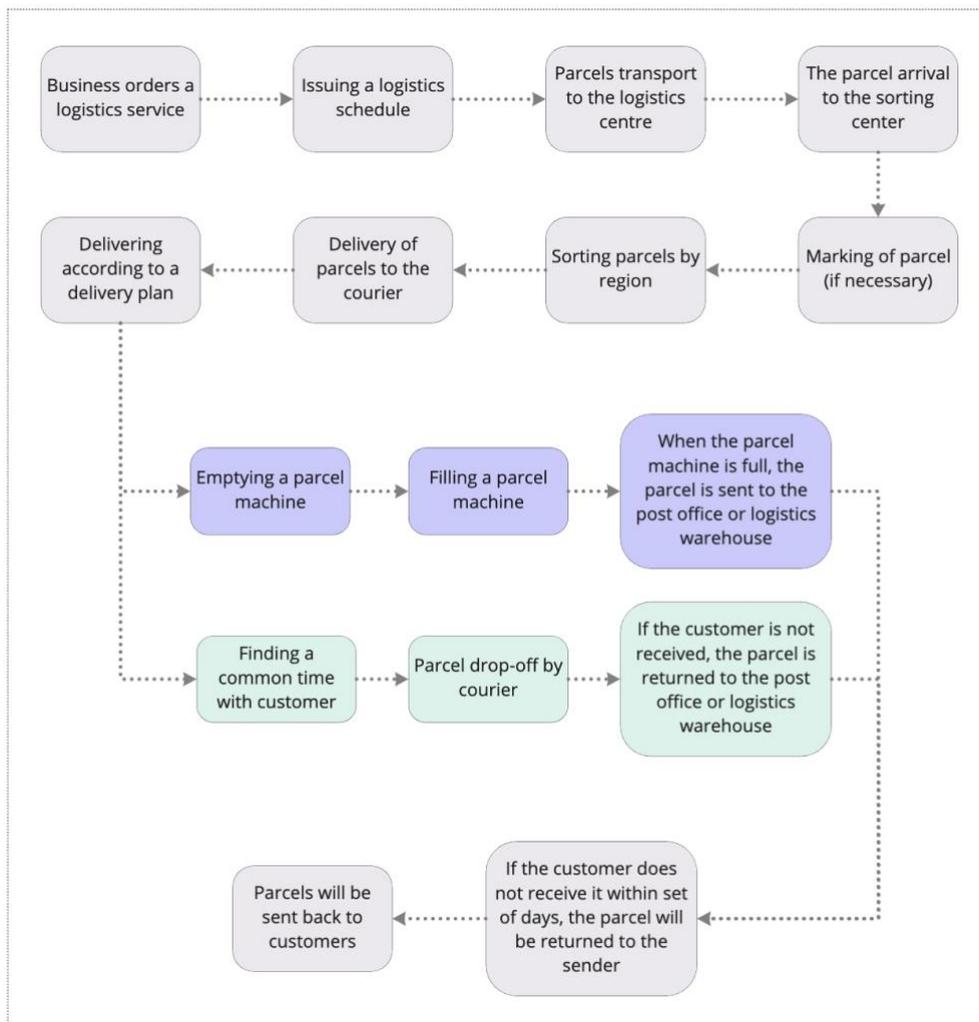

Figure 3. Parcel delivery process steps. Figure made by the author.

Many large companies, such as Amazon, have a personal logistics sector and the entire transportation process takes place within the company. Those companies have their own ships, planes, and vehicles to manage the chaos caused by growing demand. All the steps that are brought out in Figure 2. are carried out internally. [7]

Companies that use third parties order courier to collect parcels from preferred location, which is usually the company's warehouse. From there all parcels arrive to the sorting hub, where all parcels are grouped according to the final location. Each parcel has a bar code which signifies shipment information. When scanning a barcode, information about the parcel also arrives to the customer, which allows the customer to track the location of the parcel. The information is transmitted at intermediate points, so at the time of transporting the parcels it is not possible to know exactly where the parcel is located. Parcels travel to the final destination by sea, air, or land, depending on the distance from the sending destination to the final destination. When arriving to the destination hub the parcels are scanned and sorted once more to divide them to even more specific regions. When the last sorting has been carried out, the couriers load the parcels to the vehicles and take the parcels to the parcel machines or deliver them to the customer in person, according to the solution chosen by the end-customer. [Appendix 1]

3.1.2.   Last mile delivery

The phrase "last mile" was used by the telecommunications industry to describe a network's final leg. It refers to the last part of the delivery process from the last distribution hub, consolidation point, or local warehouse in the supply chain. The last mile of the delivery process is thought to be the least efficient and environmentally friendly.[8]

Despite the foregoing, it is the most important step of the process since in this stage, the parcel delivery comes into contact with the end-customer, whose assessment of the service is what determines the company's future demand. Various solutions have already been developed to meet the needs of the customer, which simplify the receipt of the package and enable the package to be available at a time that suits the end-customer best.

The customer can order the parcel at a suitable location by courier, in which case the customer must be ready to be in contact with the courier at the time of his/her arrival

and be ready to receive the parcel at a previously specified address. In case of such solution the customer must take into account the time of arrival of the courier and plan the possibility of receiving the parcel in person. [Appendix 1]

As the volumes of parcels have increased, the couriers are in constant trouble to fill the given volume that is set for them by the logistics company. As a result, fast delivering schedule is the only option how to meet the goal. Although customers know that the parcel is coming to them, a common problem is that it is not possible to reach the customers and therefore it is difficult to deliver the parcels in time. [Appendix 1]

In addition, it is possible to send the parcel to a suitable parcel machine. With this solution, the couriers transport the parcels to the parcel machines and the customer receives a message about the arrival of the parcel. Upon receipt of the message, the customer can pick up the parcel from the parcel machine within the following days. If the parcel is not picked up, the parcel will be returned to the sender. [Appendix 1]

Estonian e-commerce statistics and a case study conducted in Amsterdam in 2019 has revealed that people mostly prefer to use parcel machines as a last mile parcel delivery solution. [9, 10] Nearby home addresses and on the way home from work are the most favoured locations for parcel machines. Locations near shopping centres and bus/tram stops are the least desirable. Nonetheless, parcel machines are mostly located on urban commercial streets, suburban shopping malls or grocery stores with large parking lots and near post offices. The locations of parcel machines are mainly selected on the basis of their cost-effectiveness. [9] Customers in the city have access to a variety of parcel machines, as the nearest one is usually only a short walk away. Customers in residential regions must choose parcel machines that are farther away from their homes because parcel machines in suburban communities are typically located at the nearest shopping mall.

Although the parcel machines are a growing trend in the last mile step in parcel logistics there are still problems that occur with that solution. Due to the increase in volume, the existing parcel machines are constantly full and need additional solutions to accommodate as many packages as possible. By the end of the previous year, Estonian international post, and logistics company, Omniva has introduced a new solution in which the packages of one customer are moved to one parcel machine slot to provide free space for as many customers as possible. Although the solution is an improvement and allows you to create extra space, there are still few customers who would order more than one package in a short period of time. Given the urban space and the free

space used to store parcel machines, a new problem is emerging: the free space for adding parcel machines to urban space is limited. [Appendix 1]

3.1.3.   Emerging solutions for last mile parcel delivery

Unmanned aerial vehicles

Drones are the most promising air delivery alternative for last mile deliveries. Drones have the benefit of being able to move quickly and are also compact. Furthermore, airways are typically clear at drone flight altitudes, and drones can reach their target considerably faster than conventional road-based options. Because of its lightweight, there are limitations on the size and weight of packages that may be delivered by drone, limiting the solution's use. [11]

The biggest advantage of drones is that the parcel arrives in less than an hour. This makes the drone one of the fastest, if not the fastest, parcel services.

Road-based autonomous vehicles

Road-based autonomous delivery solutions are legalized vehicles that are allowed on open streets. This means that the vehicle must be capable of driving in traffic with other vehicles. These kinds of vehicles will still focus on low-speed areas and are designed to cover smaller areas at once. Since there is no driver, more space can be used for parcels. These kinds of vehicles are not yet fully regulated by law. [12]

Several countries are working to issue national regulations for autonomous vehicles. In addition, the European Commission is preparing technical requirements for autonomous vehicles. Today, it is possible to apply for a special permit in some countries to drive autonomous vehicles on a pre-specified route.

Ground-based autonomous vehicles

Small self-driving robots that often drive on sidewalks are examples of ground-based autonomous systems. These robots are most typically employed to deliver groceries or meal deliveries and can fit one person's delivery items in them. They don't need any special type-approval and they are much easier to bring to the market than road-based vehicles. [11]

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The aim of all the previously mentioned solutions is to make the life of the end-customer as comfortable as possible. The solutions make parcel delivery times shorter, the time and location of parcel delivery more flexible, and in the long run the price of the service cheaper. All these things seem life-changing and will make fulfilling people consumption needs easier than ever. All there is to do is to order goods online and wait for them to arrive to your doorstep. Unfortunately, all of this has also negative effects on customers daily lives and overall well-being.

3.2.   Research question

The continued growth of e-commerce has put pressure on the development of new logistics systems to meet the growing demand. Last mile parcel delivery is moving towards increasingly technological solutions that make life easier for end-customers, but at the same time can have a detrimental effect on their well-being. Therefore, the initial research question is:

How can the parcel delivery support the development and growth of customer well-being?

Conducted hypothesis based on the research question:

By rethinking the last mile parcel delivery, it may support the development and support of customer well-being.

3.3.   Well-being

Feeling good and functioning well are the two major components of well-being. Happiness, satisfaction, enjoyment, curiosity, and involvement are all traits of someone who is having a pleasant experience of their life. Our ability to function in the world is also crucial to our overall well-being. Positive relationships, a sense of control over your life, and a sense of meaning and purpose are all important aspects of well-being. [13]

Well-being is defined by the Oxford English Dictionary as "The state of being or doing well in life; happy, healthy, or prosperous condition; moral or physical welfare (of a person or community)." [14]

Well-being is described as how we feel and function on a personal and social level, as well as how we assess our life as a whole. To clarify, how individuals feel is a term that refers to feelings such as happiness or anxiety. People function in a variety of ways, including their feeling of competence and their sense of connectedness to those around them. People's life satisfaction, or how they evaluate their lives in comparison to the best possible life, indicates how people evaluate their lives as a whole. [15]

It's critical to remember that happiness and well-being are not synonymous. Happiness is primarily related to how people feel in the present moment, rather than how they assess their lives as a whole or how they participate in society. Well-being is a far broader term than happiness: it includes not just happiness, but also how satisfied people are with their lives, as well as aspects like autonomy (a sense of control over one's life) and purpose (having a sense of purpose in life). [15]

It is preferable to use the term 'well-being' instead of 'happiness' when addressing what makes life good for the individual living that life. General well-being is what is "good" for a person. As a result, while happiness is an important component of human well-being, it is not the foundation for everything. 'Self-interest' is a related concept worth mentioning here: my self-interest is what is in my best interests, not of others. [16]

In order to increase well-being, it is necessary to understand which parts of your life are most important and to contribute into these topics. While focusing on actions that have positive outcome on your most important parts of life, increase in well-being is certain to come.

3.3.1.   Increasing well-being

There are various behaviours that can help enhance overall well-being. All these actions must be considered, and one must ensure that all of these actions occur to a somewhat extent in their lives. [13]

- **Emotional well-being**. **Take notice.**

The ability to use stress-management and relaxation strategies, to be resilient, to promote self-love, and to generate positive emotions [17]. While being curious of the world and noticing the small things around will help you to appreciate what is the most important in life.

- **Physical well-being. Be active.**

The ability to improve your body's functioning through healthy eating and exercise practises [17]. Across all age groups, regular physical activity is linked to a higher sense of well-being and reduced incidence of depression and anxiety. [13]

- **Social well-being. Connect.**

The ability to converse with those in your immediate environment. The crucial steps in overcoming loneliness include communicating, creating meaningful relationships with others, and maintaining a support network. [13]

- **Developmental well-being. Keep learning.**

The ability to find meaning, enjoyment, and enrichment professionally by pursuing your interests, values, and life purpose [17]. The benefits of continuing to learn throughout one's life include increased self-esteem, increased social engagement, and a more active lifestyle [13].

- **Societal well-being. Give.**

The ability to participate actively in a thriving community, culture, and environment [17]. Doing something nice for others and donating your time and energy to a good cause may be quite fulfilling and lead to pleasant interactions.

It is possible to positively improve personal well-being by focusing on the actions listed above. By interacting at the level of 'functioning,' the activities primarily influence well-being and mental capital. They may not be sufficient to define 'good functioning' in its entirety, but they do play an important part in meeting needs for positive connections, autonomy, competency, and security, according to the research so far. [13]

The action themes are designed to support comparable and more regular well-being-promoting behaviours through their own positive feedback loops. For example, 'giving' by doing something nice for someone will almost always result in a thank-you, increasing satisfaction and the possibility of doing something nice for someone else in the future.[13]

In order for each individual to contribute to the collective and planetary well-being, it is important to start with yourself and pay attention to personal well-being. By feeling well and having control over your own well-being, you can also contribute to what is happening around.

3.3.2.   Technology impact on well-being

The development of parcel delivery technology has made e-commerce easier for consumers, with its good and bad effects on well-being. On the one hand, the simplicity of technological solutions simplifies our day-to-day chores and makes tasks that seem time-consuming effortless.

On the other hand, the complex technological world is hidden behind the simplicity for consumers. If there's one aim that almost everyone in the digital business has agreed on, it's to provide a seamless experience. Apple, Amazon, and Uber have changed their industries and gained billions simply by lowering the amount of effort required for online shopping or ordering a cab. While this strict focus with simplification was vital while corporations were upgrading from the era of dial-up internet and flip phones, it has now drifted into facile territory, failing to address the seismic changes in society's connection with technology over the last several years.[18]

Big technology companies have an overview of the lives of all users. They collect countless data on all of us in order to build a picture of society's true problems. They know more about everything than anyone else ever has in human history, due in large part to these companies leveraging the power of data and artificial intelligence. It is not sufficient for an enterprise to concentrate solely on efficiency or client satisfaction. To have a positive impact on society, they must focus their attention and resources on social innovation. Digital technologies are not just software products tools, but powerful weapons that enable economic growth and can simultaneously cause civil breakdowns in our society and threaten our freedom. Technology corporations owe a special

obligation to society, to the people who bought their products, clicked on their commercials, and used their technology to create businesses and ways of life. [20]

According to research, consciously incorporating friction into technology might enable more thoughtful interactions and allow individuals to pause and consider the broader implications of their online decisions. Ulrik Söderström, Sarah Hale and Thomas Mejtoft, associate professors of Media Technology at Umea University in Sweden, revealed in a research paper that app designs with added design friction and that provided more information about how they operated left users more satisfied and gave them clear understanding of the goal of the task.[19]

Ordering goods from the online store requires only a few clicks, and the journey of the parcel to the customer's door seems so easy. The experience with the ease of use leads to an increase in consumption. As the whole process of how the package reaches the customer is usually unknown, it gives the expression that the whole process goes without too much effort and thus attracts people to consume even more. Due to the ease-of-use costumers' lives have become much easier, and their well-being has begun to decrease. Ways that make life comfortable and easy have removed the motivation to plan activities outside of home, all kinds of solutions have been put in use that allow to complete all the necessary actions without leaving home.

Due to that, physical activities, meeting new people and having spontaneous face to face discussions have decreased. People tend to avoid excessive contact, if possible, work remotely, and spend most of their time at home.

The possibility to order lunch in the office or order groceries at your doorstep eliminates the need to find time to go to the store after work or walk to a café during lunch time. Although the simplification of managing everyday chores with technology allows to use free time to your advantage, people still use their free time to hang out at home or interact with social media. In addition to reducing physical activity, it also reduces sociality. There is no opportunity to meet new people, develop spontaneous conversations with strangers or have physical conversation with friends and family.

All of the above has a major impact on people's well-being. New technological solutions have mostly positive effect on our daily lives, but in reality, people are becoming more and more passive. As a result of inactive lifestyle, people experience illness symptoms as sleep problems and fatigue which can cause reduced performance or sickness absence which in turn affect our day-to-day operating. [21]

3.4.   Chapter conclusion

To summarize the theoretical research in this chapter, we can conclude that regardless of whether human consumption is on the rise or not, ordering of goods from online is on the rise. As a result of e-commerce, parcel logistics is overloaded, and innovative technological solutions make it possible to cope with the growth of volume.

The parcel transport system consists of several different stages, all of which are interdependent, but as the volumes increase, it is clear that it puts the most pressure on the last mile delivery. If in other stages of parcel transport, it is possible to transport a large number of parcels all together from one point to another, then in the last mile parcel delivery all parcels must be delivered separately to the end-customers, which overloads the volumes of this stage. Still, it is important to think through the bottlenecks of this stage and the impact on end-customer well-being.

It is important not forget how technological innovations affect our daily lives. Technological innovations are a part of our lives and thanks to them it is possible to change the end-customer's experience of using the parcel service. It is still important to understand how to use these innovative solutions in a way that does not have a negative impact on our well-being. Well-being is a state that gives positive value to our lives. In a situation where the parcel service has been made as easy as possible, it is important to find ways to combine it with ways that promote well-being in order to maximise the benefits.

Therefore, it seems important to focus on providing solutions for physical and social well-being in order to promote customer well-being through last mile parcel delivery.

In order to achieve a solution that takes into account the customer's wishes and needs as much as possible, I decided to focus the thesis solution offer on a specific user group. It is clear that a person's needs for a parcel service depend on where they live. Interviews with people working in a parcel logistics companies revealed that currently the urban areas have the best last mile logistics system, where the emphasis is on covering the entire urban space with different parcel service options. In the city area, you can find various service providers just a few minutes 'walk away. ´

In residential areas, the logistics of parcel delivery is covered more poorly than in the cities. The parcel delivery solutions in urban areas are available in the nearest shopping centres and grocery stores. Therefore, the customers living in residential areas that are located outside of city have to plan a pickup in public spaces or use more personalised

delivery solutions. Although there is a great sense of community in residential areas and people are ready to contribute to the development of their community, last mile parcel delivery solutions haven't gotten that much of attention. Taking all of the above into consideration, I decided to base the solution offer on the residents of residential areas who live in the districts of private houses near the city, such as the districts of Peetri or Uuesalu in Rae municipality, near the city of Tallinn.

4. REFRAMING

When taking into account the theoretical research and the field research and also the problems of the last mile delivery and the customer well-being the following reframe of the initial research question was conducted:

How can the last mile parcel delivery promote the development and growth of customer physical and social well-being in residential areas?

The hypothesis based on the reframed research question:

By rethinking the last mile parcel delivery in residential areas, it may enable the customers to choose a solution that will promote their physical and social well-being and have a positive impact on their life.

5. CO-DESIGN WORKSHOP 1

With a freshly reframed research question I moved on to the field to gather valuable input from the stakeholders. At the beginning of the dissertation, I decided to involve stakeholders throughout the process in order to design the final solution as user centred as possible, considering their ideas and needs. Therefore, I conducted a co-design workshop aimed at gathering customer input on the last mile parcel delivery system, well-being and how these topics are linked.

The workshop consisted of three exercises and was attended by a total of 6 participants, all of whom live in one residential area [Appendix 2]. Half of the participants were entrepreneurs and therefore spend a lot of time at home. The other part of the participants were employees but share their working time between home and work. All participants have different hobbies in their free time and are rather active people, but after the covid pandemic they have become much more home centred and therefore their sociality has decreased.

5.1. Understanding the customer expectations in last mile parcel delivery

The customer's main expectations for last mile parcel logistics stem from their previous experience. Negative experiences often have a greater impact on customer experience. In the case of a delivery service, the decisive factor for the customer is that the service would be cheap and fast. However, if the quality of the service or the condition of the package is affected by these expectations, customers are ready to give up these expectations. [Appendix 2] Customer preferences have become increasingly important in the formerly business-oriented parcel delivery market, thanks to the rise of e-commerce. Last mile services have been regarded as a key differentiator for large e-commerce businesses as well as numerous start-ups. With this in mind, vendors are working hard to give the greatest possible client experience, particularly in terms of delivery timelines. [22]

The last mile parcel service is one of the most important steps in the entire system and should therefore be well thought out to avoid negative customer feedback. With the system, customers expect the process to be convenient and easy. Frictionless solutions can make the system desirable for the customer. The declaration of the parcel should

be done automatically, and if the parcel needs to be returned, the process should be well thought out and simple so that the customer does not have to figure out how to return the unsuitable delivery. To make the ordering system more convenient to the customer the payment system could also be simplified. According to the quantity of packages ordered, an invoice could come from the logistics company at each end of the month, which could take into account the number of your orders. [Appendix 2]

When using a courier service, customers are usually divided into two, who wants to have the contact with courier and who would prefer the courier to leave the parcel behind the door to avoid excessive contact. Customers would appreciate it if they can choose a suitable time for the delivery of the parcel and that the courier announces their arrival before arriving and that they would arrive in time as promised. It is also important to have couriers contacts so that customers could directly contact them if necessary and specify the delivery of the parcel. [Appendix 2] The prevalent incidence of delivery issues appears to be lowering consumers' market expectations. Customers are concerned that their deliveries will arrive on time and are concerned that their packages will be kept in a secure location. This lack of faith is even more obvious among time-pressed and disabled customers, who expressing their doubt in the system. [23]

Customers do not see the need of post office and mostly try to prevent parcels from getting to the post office, where there are constant queues and where the service is only available at working hours. Instead of sending parcels that are not received by the customer to the post office, the participants suggested that these parcels could be sent to the nearest parcel machine in order to avoid the inconvenience of the post office. [Appendix 2]

Parcel machines are often preferred due to the service speed and 24-hour availability. Although, the majority of collection sites are found in supermarkets, gas stations, and other commercial establishments. Which means fewer hours of operation. The safety of a locker has also been recognized as a perk, yet people believe that home delivery is safer than locker delivery. [9] Although parcel machines are easy to use and quite convenient, they do not meet all customer expectations. The customer wants to access the parcel machine at any time and at the same time expects the parcel machine to be able to keep their parcel warm or cold as needed. The location of the package in the parcel machine should be chosen according to the size and weight of the package so that the locker wouldn't be too small for the package, or the heavy packages wouldn't be on the highest shelves. Customers expect the parcel machine system to be as simple

as possible so that it would be possible to easily send someone else to pick up the parcel as well. [Appendix 2]

The most convenient solution for the customer would be for all delivery providers to share the last mile service and for the packages of all providers to be in a shared parcel machine. Customers would prefer the parcel machines to be located in a quieter area to avoid visiting shopping malls to only pick up the parcel. [Appendix 2] The most preferred sites are near home addresses and on the way home from work. Locations near shopping centres and bus/tram stops are the least desirable. Customers who pick up packages from parcel machines by automobile do it on their way home from work, combining this with other tasks. [9] One solution for that could be that each residential area could have its own parcel machine for its community. In this case, it would be possible to pick up the parcel on the way home from work or take a walk in the area to pick up the parcel. [Appendix 2]

5.2. Important aspects of customer well-being

In order to be satisfied with your life, it is very important to emphasize well-being. The aim of the second task of the workshop was to understand what people in residential area value most in their lives and what activities ensure their well-being. The discussions in the task revealed that all parts of well-being are influenced by each other and play an important role in our daily lives.

Emotional well-being
Emotional intelligence and emotional well-being are linked in theory and research. Emotional intelligence entails the ability to recognize and control emotions, whereas emotional well-being entails a positive attitude and strong self-esteem. Various authors have theorised that high emotional intelligence would lead to greater feelings of emotional well-being. [24] Emotional well-being is ensured by people's satisfaction with themselves as well as the support and recognition of their loved ones. Engaging in your hobbies and being content with your body and mind are important parts of a stress-free life. Good relationships with loved ones, their support and recognition create a sense of belonging which is also important for emotional well-being. In addition, having economic security also ensures prosperity. [Appendix 2]

Physical well-being

An active lifestyle is the cornerstone of physical well-being. Regular exercise, doing sports and having a healthy diet contribute greatly to this. Physical well-being is also supported by several other activities. In order to improve and support your well-being, it is important to take time off and sometimes do nothing. Walking in the open air and letting your thoughts rest are substantial to support emotional well-being through physical activity. Physical proximity also plays a role in it, being with people who are important to you can contribute to your own well-being and can also contribute to the well-being of others. [Appendix 2]

Social well-being

People and the environment around us play an important role in social well-being. The social lifestyle is supported by good relationships with loved ones and the quality of spending time with them - talking to friends, organising movie nights, going to a café, etc. Having heart-to-heart communications and sharing your worries and joys with those closest to you will help relieve stress and thus support both emotional and social well-being. Good relationships with co-workers and with the neighbours help to create a sense of belonging. Getting to know new people is also an important part of social well-being, through which it is possible to broaden your views on life, find like-minded people and experience new emotions. [Appendix 2] People who believe their lives are socially coherent should also believe their personal lives are. As a result, those who score higher on the social coherence scale should feel like their personal lives are more predictable, controllable, and hence more sensible and comprehensible. [25]

Societal well-being

When promoting our well-being we can also think beyond ourselves. By being socially active and contributing to what is happening around us, we also feed our social well-being. It is important to notice what is going on around us and to contribute to the development of the community and the environment. By tolerating minorities and considering other people and their contributions, we can contribute to the well-being of society. Today, where military actions are deeply shaking the world, people's desire, and willingness to contribute to supporting those in need can be clearly seen. Through tragic circumstances, we are increasingly learning to contribute to society at the individual level and to strive for common well-being. A democratic society gives us all the opportunity to contribute for the common good [Appendix 2].

People who feel socially integrated, close to and comforted by people in their community should consider themselves to be part of a vital and healthy community. As a result,

socially integrated people should consider their neighbours as trustworthy and their neighbourhoods as safe. Adults who have been integrated into society are also more likely to volunteer to help preserve their neighbourhood, perhaps because they believe their activities will be appreciated by others and because they wish to keep their neighbourhood in great shape. [25]

Developmental well-being

In order to feel satisfied with our lives and take care of your own well-being, it is very important to continuously learn and develop, both on a personal and societal level. To ensure your well-being and satisfaction, you must be open to new challenges. Take the necessary lesson from each experience and find ways to develop yourself. By reading books, experiencing cultural experiences, engaging in hobbies you enjoy, broadening your views while traveling and contributing to career advancement, you can contribute to your own development and, through it, your well-being. [Appendix 2]

5.3. How well-being can suffer in last mile parcel delivery

The last mile parcel delivery system has various effects on our well-being as well as the frictionless experience of ordering from online and increasingly convenient solutions for delivery.

The convenience and simplicity of the system eliminates the need to leave home and affects many aspects of well-being. People remain home centric and don't see the need to leave home, as a result of which physical contact with the outside world is reduced and communication is increasingly moving to social media. Spontaneous communication and meeting new people can suffer, which makes people closed and antisocial. All of this contributes to an inactive lifestyle that can lead to health problems. [Appendix 2]

The main solutions for the last mile parcel delivery for the residents of a residential area are the use of a courier or the parcel locker of the nearest store in the area. Many residents of the residential area do not prefer to pick up their parcels in shopping malls. [Appendix 2] When ordering goods, a decision must be made in the ordering phase as to where to pick up the parcel. The customer has to know in advance which location would suit the best. When the parcel arrives, the customer has to plan the time to pick it up. Every trip to the mall to pick up a parcel reduces the well-being of both the

recipients of the package and the people who go shopping in the mall at the same time, because they compete for the same space even though they meet in the mall for completely different purposes and therefore do not find a common language for socialising.

Excessively frictionless solutions reduce the need to delve into the functioning of the system and could create situations where people are unable to think systematically and delve into the daily actions that require thinking. The workshop also revealed that in a situation where the system performs all operations on behalf of a person and the customer simply has to pick up the parcel can cause incompetence to find solutions to problems in other areas of life as well. [Appendix 2]

In addition to evolving technological solutions, well-being is also affected by the traditional courier parcel service. While technology directly affects the person themselves and has far-reaching consequences for the reduction of sociality and contribution to society, the courier service can have direct affect from one person to another. Frustration with customer service and an unpleasant courier experience affect our well-being and can transfer the negative energy of one person to another. Well-being can also be suffered due to the lack of knowledge of the courier's arrival time or in a situation where we have to schedule our lives according to the courier's work schedule, often giving up activities that promote our own well-being. [Appendix 2]

5.4. Chapter conclusion

As the discussions and the mapped input in the workshop have shown, it is very important for the customers of the residential area to create a unified last mile parcel delivery system for the community. Customers value their time and would prefer to have the last mile in a safe and peaceful environment without having to take the time to go to the city or suburban shopping malls to gather their parcel.

It is also important for locals to promote their community and create good living conditions to maximise the potential of the residential area. Since people are becoming more and more home centred and get most of their activities done at home, it is important for them to find ways to take time off and find ways to communicate with new people and have spontaneous conversations. A healthy and active lifestyle is also considered important.

Solutions that would invite people out of their homes and promote an active lifestyle are highly welcome. Opportunities to find activities in their own neighbourhood and to build relationships with community members can support people's social and physical well-being, through which other parts of their well-being can benefit as well.

A workshop with customers living in a residential area provided much needed input to create a user-centric proposal. As a result, it was possible to bring together the most important aspects of the solution and to summarize the main objectives to be kept in mind when proposing a solution.

6. DESIGN BRIEF

The design brief in this thesis is presented as the baseline to provide a solution that promotes the development and growth of customer physical and social well-being through last mile parcel delivery, based on the outcomes stated in the preceding chapters. The Figure 4. describes how I would like to achieve the goals with the proposal.
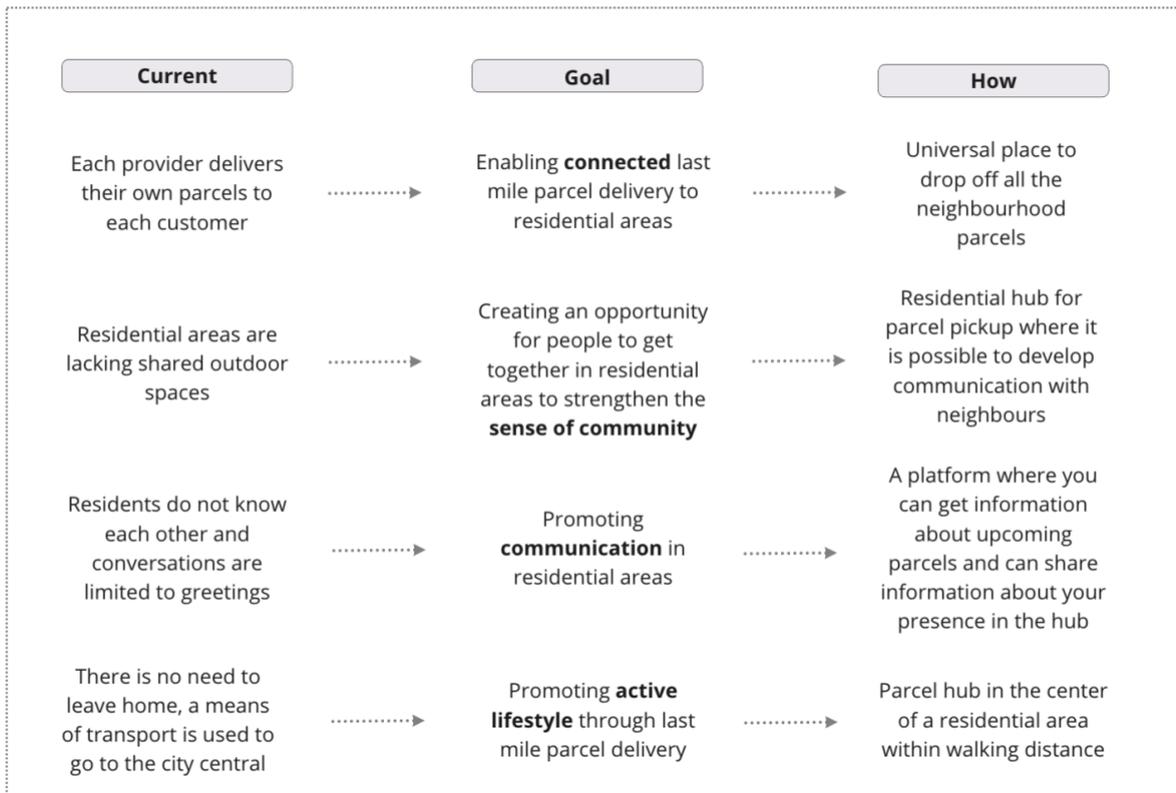

Current	Goal	How
Each provider delivers their own parcels to each customer	Enabling **connected** last mile parcel delivery to residential areas	Universal place to drop off all the neighbourhood parcels
Residential areas are lacking shared outdoor spaces	Creating an opportunity for people to get together in residential areas to strengthen the **sense of community**	Residential hub for parcel pickup where it is possible to develop communication with neighbours
Residents do not know each other and conversations are limited to greetings	Promoting **communication** in residential areas	A platform where you can get information about upcoming parcels and can share information about your presence in the hub
There is no need to leave home, a means of transport is used to go to the city central	Promoting **active lifestyle** through last mile parcel delivery	Parcel hub in the center of a residential area within walking distance

Figure 4. Goals for the proposal and ways to achieve them. Figure made by author.

Based on this, the design concept should have two primary objectives: to facilitate parcel delivery pickup for the residential community and to encourage neighbourly engagement. The following are the requirements for this to happen once the goals for the proposal have been identified:

- The design proposal must connect the last mile of all the parcel delivery providers together. In this way, customers can be sure that all packages always come together in one place. The parcel delivery providers can simplify their process by dropping all parcels to one place.

- By picking up the parcel the proposal must give people the opportunity to interact with their neighbours and thereby strengthen the sense of community. In order for the residents of the area to be able to meet and communicate, there should be a hub in the middle of the community where everyone could pick up their parcel and also meet their neighbours. The last mile parcel delivery hub should serve the purpose for parcel pick up as well as centre for communication.

- The solution must promote communication in residential areas. Communicating with neighbours allows you to find new acquaintances, initiate new ideas to promote the community, and thus promote your and others social well-being.

- Since physical activity is essential for healthy lifestyle, it is important that the solution encourages customers to take a walk to pick up the parcel and thereby contribute to their physical well-being.

7. CO-DESIGN WORKSHOP 2

With the goals set in the design brief, I moved on to the second workshop. The aim of the second workshop was to introduce customers to the design brief based on their previous input and to give customers the opportunity to be part of the solution creation process. The second workshop was again conducted with the same group of participants who attended in the first co-design workshop. The mapping and the main insights of the workshop are brought out in Appendix 3.

The exercise of the workshop was preceded by a previously prepared pre-story, which introduced the participants to the general nature of the solution based on the objectives conducted in the design brief. The intention of the pre-story was to introduce the participants to the content of the workshop and to lead them to a wave of solution development. After reviewing the background, the creation of a design concept began.

The structure of the workshop task was carried out on the principles of a business model canvas. It is a strategic management tool for defining and communicating a business idea or concept quickly and effectively. It's a one-page document that goes through the fundamentals of a business or product, laying forth an idea in a logical manner. [26]

With the workshop exercise, I intended to validate the conceptual proposal of developing a space in residential neighbourhoods that would give residents a space where, in addition to picking up e-commerce orders, they could also gather and socialise with other inhabitants in the area. I was seeking for feedback from the participants on the elements that would be most important to them, where they saw potential and weaknesses, as well as highlighting some characteristics of the present last mile parcel delivery system that should be avoided.

The main insights from the co-design workshop:

- Linking parcel delivery to the community helps to make its existence more natural and thus a normal part of environment.

- In order to facilitate payment for the parcel delivery service, each customer must pay for the service once within a specified period of time.

- By creating a common environment, the neighbours might find likeminded people among themselves and lead to more meaningful relations.

- By getting to know their neighbours and the parents of neighbourhood children better, residents will feel more secure in their neighbourhood.

- Through the solution, adults will have a place to socialize, just as children have playgrounds in every neighbourhood.

- The solution will allow residents to take time off from daily activities.

- In order to promote well-being, it would be important to introduce gamification to the solution to engage more residents.

- The platform accompanying the solution should be primarily for the residential area and should also reflect the parcel logistics solution as a natural part of everyday life.

8. DESIGN CONCEPT

In order to rethink the receipt of ordered parcels, it is important to **make parcel pick-up a part of normal lifestyle**, to minimise the planning of daily schedule according to the location of the parcel machine or the courier's working hours [Appendix 3.]. By making parcel logistics a part of customers social and active lifestyle, it is possible to eliminate the link between the last mile parcel delivery and public shopping malls and make it a natural part of life. The proposed solution is **a last mile parcel logistics that is part of the social environment**. Instead of emphasizing efficiency, **the solution aims to emphasize customers well-being**. To achieve this, the proposed last mile parcel delivery solution is strongly linked to leisure and socialization.

The design concept consists of two parts: a physical Hub in a residential area and a digital platform that supports the last mile of parcel logistics and the socialization and active lifestyle between neighbours.

The Hub is a physical place that has two main purposes: providing last mile parcel service and acting as a community space for the residents in the neighbourhood. By creating a physical environment in which the last mile parcel delivery and leisure opportunities are represented, it is possible to bring neighbours together and give them the opportunity to socialize.

The Hub is located in the very centre of the neighbourhood to allow everyone a comfortable journey to the location. The purpose of the shorter distance is to motivate people to walk to the Hub in order to promote an active lifestyle and thus support their physical well-being. One of the functions of the Hub to store ordered parcels. As the volume of e-commerce and ordering online is growing, it is possible to bring the last mile parcel delivery service as close as possible to the residents
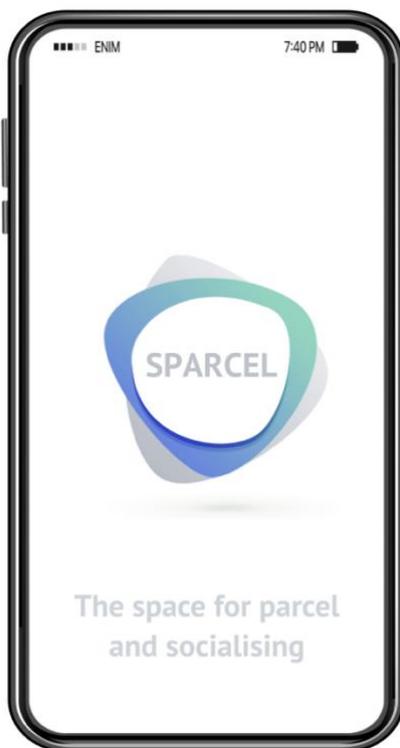

Figure 5. Concept physical space. Figure made by the author with illustrations from freepik.com and stock.adobe.com

39

of the residential area, but still maintain the possibility of 24-hour parcel pick-up availability to enable all customers the freedom to choose the suitable time for them.

Each local government is responsible for promoting healthy lifestyle and living environment in their district. When bringing the last mile parcel delivery to the neighbourhood it could provide residents a reason to gather. Therefore, Hub is likely to be an interesting concept for local governments and its existing community centres to bring community residents together and use existing spaces or create a new environment for socialization.

The second function of the Hub is to provide an environment in which it is possible to meet new people and to promote communication between neighbours, through which it is possible to find like-minded people in the neighbourhood and thereby develop new relationships, through which social well-being can be promoted.

The digital platform has also two purposes: provide digital space for last mile parcel delivery service and to promote the social and physical well-being of the residents through various functions.

Figure 6. Concept digital platform. Figure made by the author with illustrations from freepik.com

The digital platform goes hand in hand with the Hub. All residents can register as users of the platform and through that direct their parcels to the Hub. Through the platform, it is possible to monitor the status of your parcel and receive notifications when the parcel has arrived at the Hub. The pick-up of the parcel and the service payment both take place through the platform.

In order to encourage people to socialize with each other through the platform, it is possible to see how many people are currently spending time in the Hub. The platform provides a forum for community members and the local government, where it is possible to gather important information between the residents and the local government, as well as to initiate discussions that promote the community. To popularize an active lifestyle, the platform has challenges for the community and for the personal

goal to motivate the residents of the neighbourhood be active and thus take care of their physical health. Through the promotion of social and physical well-being, it is also possible to promote other aspects of well-being and thereby take care of one's body and mind.

SPARCEL is not a solution that competes with existing logistics companies. Sparcel is a solution that simplifies the work of couriers and logistics companies, provides a neutral communication platform for the community and its local government, and facilitates communication between the residents of a residential area.

SPARCEL is a residential neighbourhood service that includes a physical and digital platform to provide last mile parcel delivery service while strengthening the social and physical well-being of the residents.

8.1. Concept system

The goal of the solution is to provide a community with a platform for communication and to make the last mile of parcel delivery a part of a lifestyle of the residents. Through the proposed parcel delivery solution, it is possible to increase the probability that people in the community will receive the information that is important to them, both physically and digitally. Figure 8. shows a concept system that describes the points of contact between the stakeholders and the components of the solution.
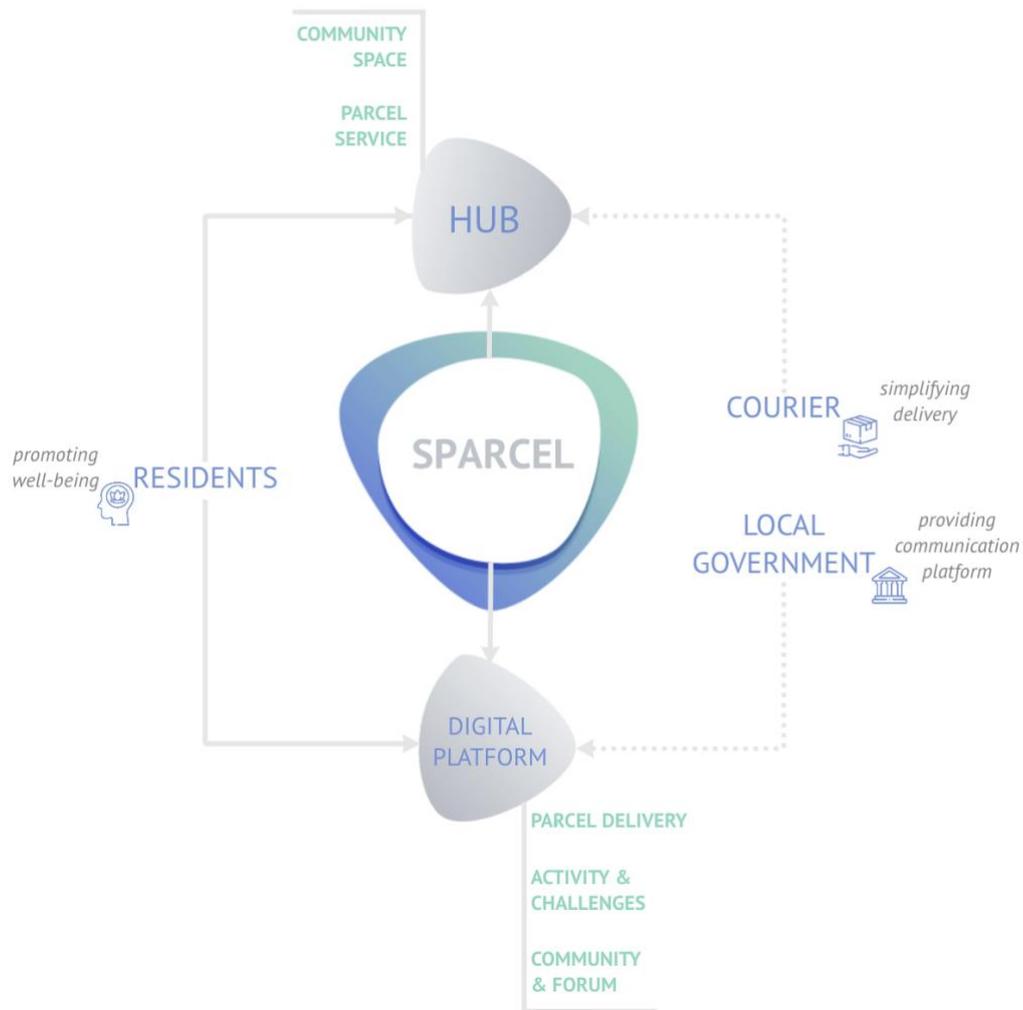
Figure 7. Concept system. Figure made by author with icons by flaticon.com

So far, parcel delivery for the last mile is largely part of the commercialisation, logistics companies have designed their parcel machines with a representative design, the best locations are hunted near the most visited shops, and so on. All of this affects customers preferences when choosing a last mile logistics provider and customers daily activities are often planned according to that.

In the solution system, the main stakeholders are end-customers who are connected to the Hub in their own residential area as well as to the digital platform. In addition to the residents, the digital platform is also intended for local governments, which can use the forum as a digital information board to communicate and exchange information with the residents of their community. Couriers are connected to the physical part of the system. Instead of going door to door and finding suitable times to deliver the parcels to the customers, the courier can take all the parcels to the Hub. As a result, the time stress of couriers and problems in reaching customers are reduced.

8.2. Environment

A Sparcel Hub is a physical community space in the centre of the neighbourhood that gives community residents the opportunity to **promote their physical and social well-being and makes the last mile of parcel logistics available** to community residents, while bringing the service as close to them as possible. Figure 9. shows a system describing the residential Hub and its elements.
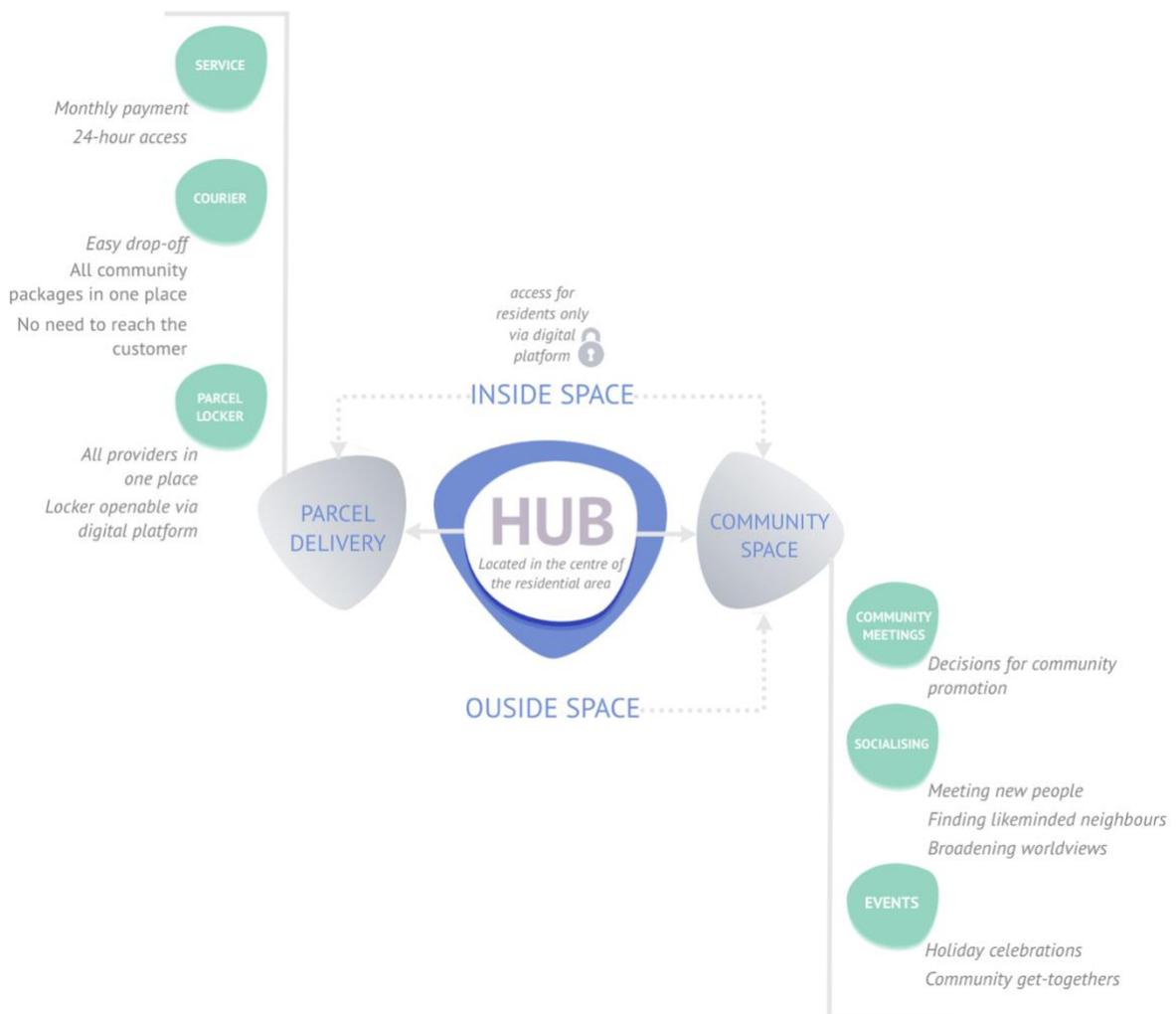

Figure 8. Residential Hub system configuration and elements. Figure made by the author with icons by flaticon.com

8.2.1. Parcel delivery

In addition to spending time, the Hub is connected to the last mile of parcel delivery. In the solution offer, parcel logistics is a **natural part of the community centre**. The Hub's parcel locker is solely for the purpose of storing parcels and has **no commercial value**. All parcels come to the same locker, regardless of which service provider was used to place the order.

The ability to leave all parcels in one location also significantly simplifies the work of a courier, since he or she does not have to spend time getting in touch with customers and going door to door to drop off the parcels. The workload of parcel couriers and the number of parcels that need to be dispatched during the day has increased as the volume of e-commerce has increased. The courier's chores will be simplified as the last mile parcel delivery system in residential areas becomes simplified, and they will **be able to serve multiple residential areas** during the day.

The arrival of parcels ordered to the Hub that is located within a walking distance facilitates to take a walk and thus also facilitates communication among community members. Despite the fact that the last step in getting the parcel in this example is contactless, it **boosts the customers' opportunity to meet other residents during the process**, enhancing social well-being imperceptibly.

Customers can pick up their packages at any time that is convenient for them, **taking into account their own schedules**. Rather than structuring their daily schedules around the parcel, residents can arrange the pick-up according to their social lifestyle.

8.2.2. Community space

The Hub offers both an indoor and outdoor area to encourage community members to communicate with one another. The digital platform is closely related to the Hub and its functions. The Hub's inside space is only accessible to members of the community who have access to the digital platform.

In Hub, community meetings can be held to discuss concerns in the residential area and come up with community-friendly solutions [Appendix 3]. By creating an environment and opportunities for all members of the community to participate in topical issues regarding the community and giving **all residents the opportunity to provide input**

to promote the environment, it is possible to strengthen the connection between the community and **increase the sense of belonging**.

Socialization and the promotion of social well-being are encouraged in the Hub. Indoor and outdoor spaces are welcoming and thus encourage residents to be part of their community and use the space to meet new people. The Hub gives the opportunity to take time out of daily chores and find like-minded people in the neighbourhood with whom it is possible to develop further communications and engage in activities of similar interests. It is possible to generate communication subjects in the process by spending leisure time with members of the community, as a result of which the residents can reach prospective community development solutions that can be proposed to the community in joint meetings.

It is a Hub where it is possible to plan collaborative events for leisure or holidays in order to foster community harmony. It is possible to improve the sense of belonging to the community and give residents the **opportunity to belong somewhere** by making the feeling of home greater than just contributing to one's own personal home.

8.3. Digital platform

Sparcel's digital platform allows customers to manage their parcel logistics' last mile solution and is also largely used to promote community socialisation and an active lifestyle. Whether or not they use the parcel ordering system, **every member of the community has a possibility to make a Sparcel account** [Appendix 3]. Much of the platform is geared on encouraging social and physical well-being, and parcel logistics is **one approach to encourage community members' well-being**.

As the parcels are located in the Hub, which is within walking distance for all residents, it motivates to take a walk there and therefore, promotes physical well-being. In addition, there is an activity page on the digital platform where you can follow your own and your community's activity and take part in activity challenges. In order to promote social well-being, the digital platform can be used to see how many neighbours are currently in the Hub and plan parcel pickup according to that. The platform also has a forum that strengthens social well-being by providing space for communication with community members and the local government.
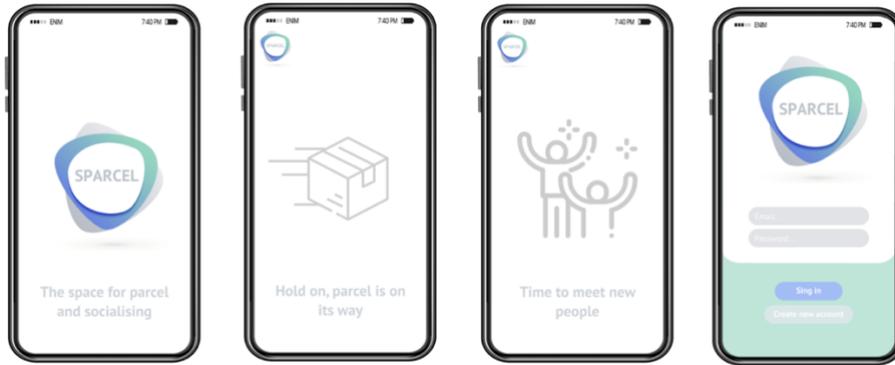
Figure 9. Sparcel digital platform architecture. Figure made by the author with icons by flaticon.com

Sparcel digital platform is divided into four sections: the hub, parcel delivery, socialisation forums, and active challenges. Figure 11. depicts the Sparcel digital platform's structure as well as the elements that make up the platform.
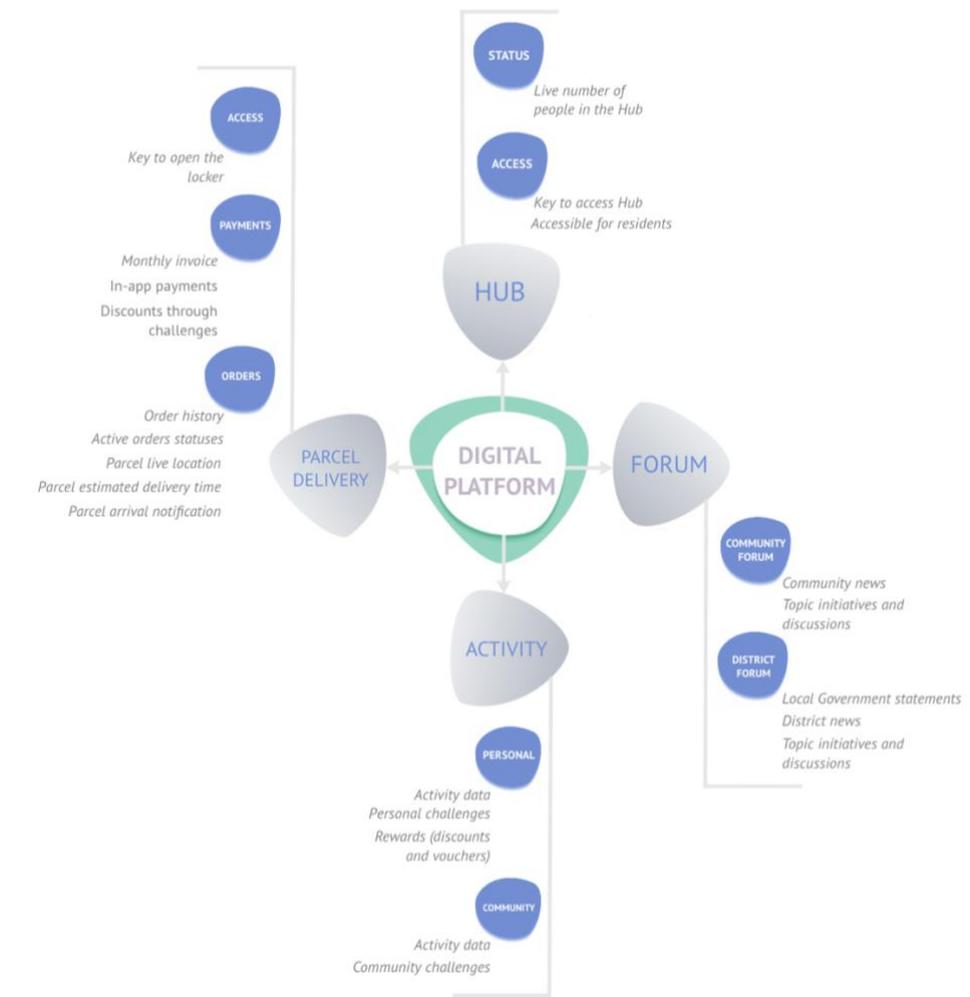

Figure 10. Digital platform system configuration and elements. Figure made by the author.

8.3.1. Hub

The physical Hub's functionality is supported by the digital platform. The Hub section in the app shows the number of people in the Hub in real time, allowing the user to determine whether or not it is appropriate for them to visit the Hub at this moment.

If a resident wishes to socialise, he or she can keep an eye on the amount of people there and decide when the best time is to go to the Hub, assuming there are other residents to engage with. It is also possible to make a decision based on this number if the resident needs to pick up the parcel, however extensive contact with other residents is not preferred at this time.

The number of residents presented in real time is not related with any users, therefore the solution is anonymised, and the user has no idea who those residents are, who are currently socialising in Hub, and who might be picking up their parcel.

As previously noted, the Hub's interior is solely accessible to people of the residential area. The Hub door can be opened at any moment using the digital platform. As a result, having a Sparcel app is essential for any resident who wishes to use the physical centre.
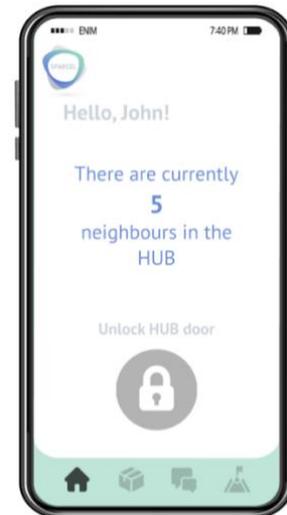
Figure 11. Sparcel digital platform Hub structure. Figure made by the author with icons by flaticon.com

8.3.2. Parcel delivery

Physical and digital systems are both used in parcel logistics. Sparcel's digital platform gives customers a complete picture of all parcels that are incoming or have arrived to the Hub.

The consumer may identify the parcel's location and observe which parcel delivery steps have been completed during the whole logistics process in a more detailed overview of each package. The item's location and distance from the customer's home are displayed on a map, indicating that the parcel has arrived at the Hub. A notification will be sent to the customer at the time of its arrival.

The customer must use the Hub page in the app to open the door to access the Hub while picking up the parcel. The consumer can then open the parcel locker via the package delivery page.
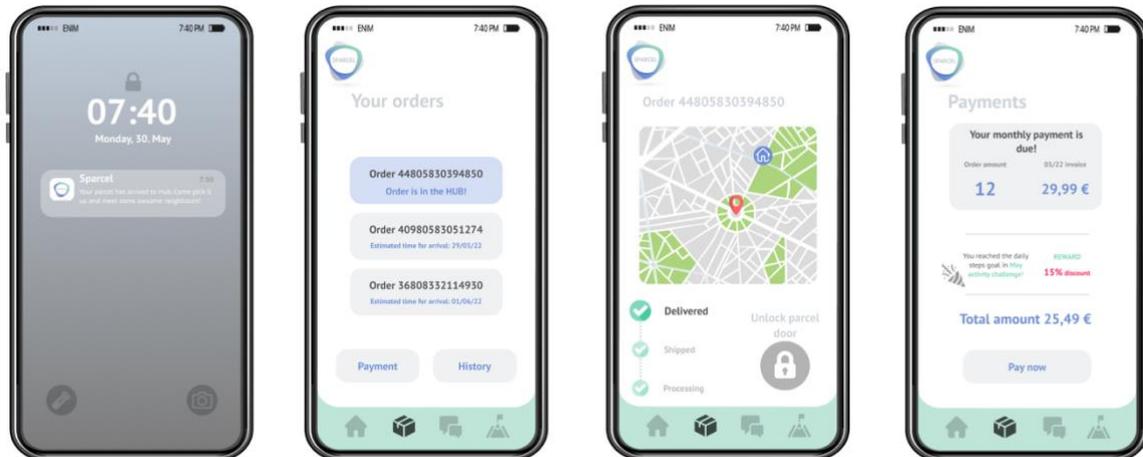

Figure 12. Sparcel digital platform parcel delivery structure. Figure made by the author with illustrations by freepik.com and icons by flaticon.com

The Sparcel app can also be used to pay for parcel transportation. Payments are made on a regular schedule, with the service being paid for once a month. In addition to calculating the service's pricing, the app displays all the times the service has been used in that month. Ongoing activity challenges may alter the final price of the service from time to time. As a reward for participating in the challenges, the user might receive discounts on the parcel delivery service.

8.3.3.   Forum

Sparcel has a page on the platform that allows community members and the wider district to share relevant information and develop dialogues to improve social well-being and a sense of community. Traditional community information boards that have been previously physically display in most interactive public areas have been replaced by the Sparcel Forum.

The proposed forum does not claim to be a traditional social media platform that will take the place of existing communication channels. The forum's intention is to provide a neutral platform where community and district information can be shared.

The platform's forum page is divided into two sections: a community forum, which allows residents to raise issues specific to their neighbourhood, and a district forum, which allows information to be shared across the district in which the neighbourhood is located.

All members are identified by their own names on the forum page and share information openly under their own names. The forum allows for the creation of posts as well as the development of discussions within those posts by all members. It is critical that all members of the district have a platform where information can be effectively transmitted and received in order for all inhabitants of the district to be able to keep up with the news and information exchanged in their district.
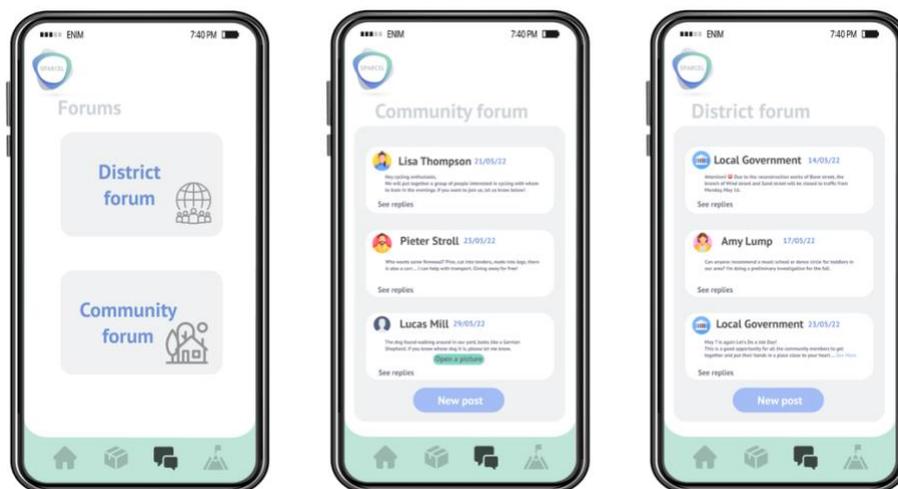

Figure 13. Sparcel digital platform forum structure. Figure made by the author with icons by flaticon.com

A community forum is a digital communication platform that allows residents to communicate with one another, discuss community issues, and share ideas for improving the community. Members of the community can also post information about lost belongings or pets that have gotten loose, as well as share free items with their neighbours.

The purpose of the district forum is to allow the local administration to engage with the citizens of its district and to provide them with important district information. Residents can also ask questions from the local administration and highlight issues that affect not only their own neighbourhood but also the surrounding neighbourhoods. The district forum allows the local administration to be more accessible to its citizens, increasing their sense of connection to the district.

8.3.4.   Activity and challenges

A page on the Sparcel platform displays the residents' personal and community activity in order to promote an active lifestyle and physical well-being among the residents of the neighbourhood. To encourage members to enjoy active lifestyle it is possible to organize various challenges and community activities. Community members can make suggestions about the nature of the competition and decide with the whole community which challenges could suit best for their community. It ensures that competitions and rewards specific to each community and its members.
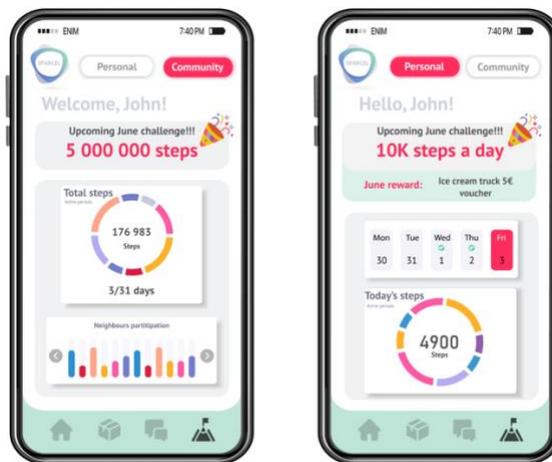

Figure 14. Sparcel digital platform activity structure. Figure made by the author with illustrations by freepik.com and icons by flaticon.com

Monthly challenges are used to measure activity. For example, if the goal of the challenge is to collect steps, the activity page will show the user's or community's total steps. If the challenge involves kilometres walked, the page will show the kilometres collected by the user or community.

All participants in community activity page are anonymous, and personal activity is not visible to other members. Residents' activities are anonymously shown as a graph to motivate the community.

A calendar is presented on the personal activity page, in addition to the activity and the ongoing challenge, displaying the current day and the days on which the challenge goal was completed. Personal activity is just accessible to the user and is not visible to the rest of the community. Monthly challenges encourage personal activity by rewarding users with discount coupons for parcel logistics services or vouchers for local small businesses if they complete them successfully.

8.4. Concept journey

This chapter presents a story of the Sparcel based on user experience to further define the design concept. The narrative explains how valuable the solution could be to the residents of the neighbourhood.

The solution offer's story focuses on a 34-year-old man named John who lives in a residential neighbourhood. John is a software developer who works from home and spends the most of his time there. John enjoys running and cycling in his leisure time, but when he moved to a new city, he had to say goodbye to his former group of sports enthusiasts.

John relocated to a neighbourhood near Tallinn. When John registered for his new home, the local authorities informed him that his neighbourhood had a Sparcel Hub and that a Sparcel app was also in use. A Sparcel account was created together him at the town hall, and an app was downloaded as well. Because John frequently orders parcels over the internet, he discovered that the Hub in their neighbourhood has a parcel locker for residents.
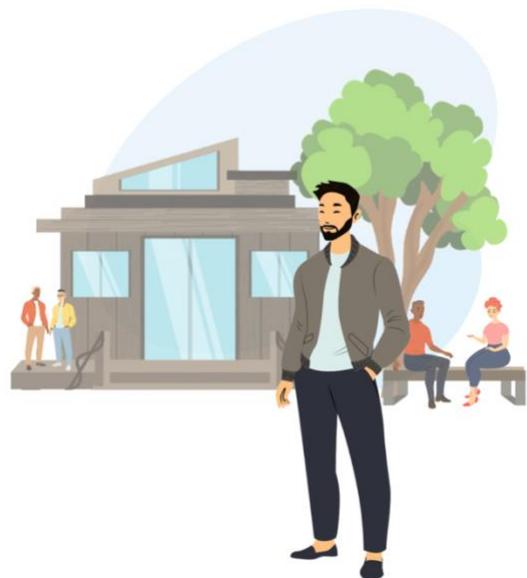

Figure 15. John visiting Sparcel Hub. Figure made by the author with illustrations by canva.com and blush.design

John was able to send all parcels to Sparcel Hub while placing new orders. When John's packages arrived, he decided to go to the Hub to pick them up while also exploring the new residential area.

Because Hub sits in the heart of a residential neighbourhood, John decided to take a walk there. From afar, he could see that many residents in the area around Hub were spending their leisure time socialising with their neighbours. As he walked into the hub to retrieve the package from the locker, John spotted several people within the Hub conversing with one another.

Figure 16. John picking up his package. Figure made by the author with illustrations by canva.com and blush.design

John used Sparcel app to pick up his parcel and discovered all the other possibilities in the app. In the community forum page John saw that a community meeting is held on upcoming Wednesday. He decided to attend the meeting to meet new neighbours and gain a better understanding of the neighbourhood and its improvements ideas. At the meeting, one of the neighbours proposed setting up an electric scooter rental station near Hub so that all residents could use electric scooters to get to the local shop or train station in the morning, reducing the need to travel to Tallinn by private car. After the meeting, John was invited to a Friday social night in Hub's, where he could meet new people and get to know his neighbours.

Figure 17. John attending community meeting at Sparcel Hub. Figure made by the author with illustrations by canva.com and blush.design
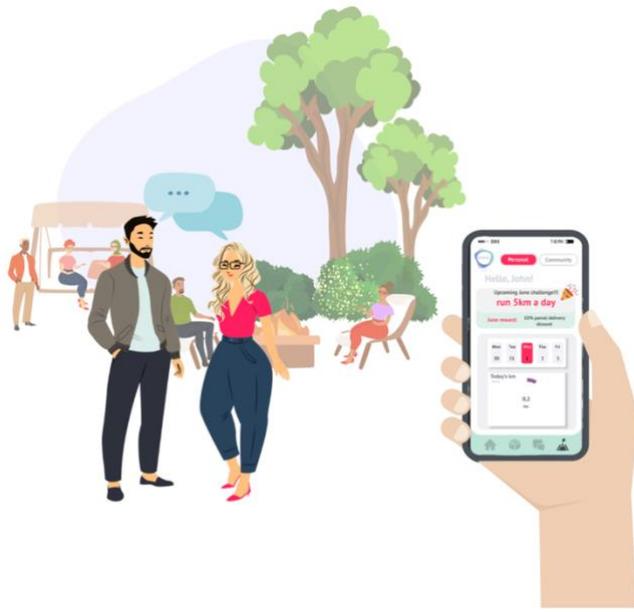
Figure 18. John socialising with Anna at Hub socialising night. Figure made by the author with illustrations by canva.com, freepik.com and blush.design

On Friday night, John accepted the invitation and went to a social gathering. The mood among the neighbours was warm and inviting, and John was relieved to have chosen a home in the area. A woman named Anna approached John and introduced herself. It was revealed during their conversation that Anna enjoys running in her spare time as well.

Anna introduced John to the ongoing activity challenge, as a result of which a 10% discount on the current month's parcel delivery service is offered as a reward. John was immediately interested and decided to accept the challenge since he uses the service frequently.

Anna invited John and a few other residents to an evening run the following days so they could participate in the Sparcel challenge together and maintain an active lifestyle.

John and Anna became good friends and actively met at Hub socialising nights. They also posted an ad to Sparcel community forum page to form a group of sports enthusiasts in their neighbourhood to take on the activity challenges together.

Figure 19. John and Anna doing sports for the ongoing challenge. Figure made by the author with illustrations by blush.design

8.5.   Conclusion and final reflection

The solution's key concerns include last mile parcel delivery and the well-being of the residential area inhabitants. These are two critical issues that are undergoing significant changes in terms of economic and societal developments. As a result, the solution suggestion addresses these challenges and stresses their improvement.

The solution offer presented in the design concept chapter is based primarily on the input of customers who live in a residential neighbourhood. Their interests and shortcomings in the last mile system and in supporting residents' well-being have been taken into account.

The proposed concept offers value primarily to the residents of the residential area, as well as to the couriers of parcel logistics and the local government. It is feasible to increase the social and active well-being of residents of the residential area through the proposed solution, Sparcel, which has a positive impact on many other aspects of well-being as well. In an evolving society, it's also important to adapt the solutions utilised to the users' lifestyles, thus it's been prioritised in the solution offering to normalise the last mile parcel delivery solution and make it a part of customers social life. Other than parcel delivery solution, the concept also proposes a space and platform for socialising with neighbours and local government to increase the sense of belonging.

Last mile parcel delivery options are currently being made more convenient, particularly for end-customers in urban areas. They are built up on commercial structure, where parcel machines are positioned in shopping malls, grocery stores, or near their entrances, primarily emphasises existing non-contact solutions that provide 24-hour parcel pick-up availability. In the case of the solution offer presented, the last mile of parcel delivery is designed as part of leisure time and as a result, the service shifts from being efficiency oriented to prioritizing customers well-being. It is possible to provide a 24-hour parcel logistics solution within walking distance to customers of a residential neighbourhood using the Sparcel solution, while still considering the residents' well-being.

The local government's installation of the Sparcel platform in each residential area is a problem that has not been addressed in this thesis. Because the proposed solution in the design concept is intended for the local government's property and has no commercial value, the local government should decide whether or not and under which circumstances to implement the proposed solution in their district.

SUMMARY

The dissertation's research focuses on resolving the parcel logistics system for inhabitants of the residential area in such a way that the system also supports the residents' social and physical well-being. The solution of the problem was based on the methodologies of the design process and the user-centred design method.

People must take care of their overall well-being in order to feel good and function well. Positive relationships, a sense of control over life, and a sense of meaning and purpose are all essential components of well-being. As a result, when proposing a solution, it was critical to keep the well-being of the residents in the neighbourhood in mind.

As a result of interviews and workshops conducted during the research, it became clear that residents in the residential area lack a convenient option for receiving parcels, and the existing solutions require separate time planning. It became clear that the inhabitants of the residential area needed a system that would make the last mile parcel logistics solution more accessible and a natural part of their normal lifestyle.

According to the research results, the solution is a physical environment and a digital platform that go hand in hand and enable to solve the last mile parcel delivery system in a residential area while also encouraging socialisation and an active lifestyle. In addition to the above, the digital platform makes it possible to create a sense of belonging in the community in order to strengthen people's social well-being.

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APPENDICES

Appendix 1: Interviews

Interviews with customers, people from business industry and people from parcel logistics companies:

Kristi, former head of marketing communications in logistics company

Conclusion: The interview validated many problems that have been stated in theoretical sources. The logistics companies are facing a problem of courier fluidity. Couriers face the problem of contacting customers on a daily basis. In the case of parcel machines, the daily problem is that filling the parcel machines takes up a large part of the courier's working day. In addition, it takes a lot of time to communicate with customers and sign paperwork, etc. The order quantities fluctuate a lot depending on the season. During the high seasons, when the parcel volumes increase multiple times, the parcel machines are constantly full. Logistics companies have to hire seasonal workers who stand in front of indoor parcel machines with boxes full of parcels and give out the parcels manually.

Egert, software engineer manager in logistics company

Conclusion: The main goal for the logistics company is to provide fast service as cheap as possible. Customers want seamless service, so they don't have to wait for the parcel like a food delivery. Their customers mainly use parcel machines, although the capacity of a parcel machine is also limited and thus, they are constantly full. Customers prefer parcel machines that are outdoors- 24/7 access and don't have to go inside a store. At the same time parcel machines take up space and there isn't enough free space in urban areas to find suitable places for them. An interesting new information was that the volume of one year's peak season is the normality of the following year, which shows very well the annual increase in volume in parcel logistics. Their company tested a new solution for parcel machines at the end of last year, where they fitted all of one customer parcels into one locker. If the customer had packages that were already in the machine, the new parcels would we fitted into the same locker to save up space for other customers as well.

Aivo, chief technology officer (CTO) in beauty products retail company

Conclusion: According to the previous experience of the company, parcels are mainly ordered to the parcel machines. One of the reasons may be the difference in price between the courier and the parcel machine service. The parcel machine service is often free of charge from a certain purchase price, and customers actively use it. It is a good

motivator how to get customers to buy more. Although the logistics process is very fast today, and in busier times the courier picks up the parcels several times a day, the company owners pointed out that they would benefit if the system were even more structured and faster. As customer satisfaction is the most important thing for them, they are satisfied with the service if the customer is also satisfied. The big advantage for logistics companies is that the parcels are picked up at their warehouses and they do not have to worry about how the parcels will be delivered. During the high season, there have been problems with packing the parcels, as companies have to hire seasonal workers so that all parcels can be shipped as quickly as possible. Due to the large volume, orders cannot be packed fast enough, and this is one of the reasons why the arrival of parcels may be delayed. The peak season is mainly caused by holiday seasons or larger discounts.

Laureen, customer

Conclusion: With the spread of the Covid pandemic, physical shopping has been avoided and all possible products are being ordered from online. During the pandemic, Laureen have had situations where smaller companies have closed their physical stores and moved to e-commerce, which have directed her to shop online. In recent years, the selection of e-commerce has increased very quickly and today it is difficult to find products that cannot be found in online stores. Laureen prefers parcel machines since she can get the parcel at a suitable time for herself. She also likes the fact that you can try the clothes on and easily send them back if necessary. She still prefers to physically shop for groceries and electronical equipment, since these things are more expensive.

Evelin, customer

Conclusion: Evelin orders from online about 1-2 times a month. Since the variety of products is much bigger and through internet there is also possibility to order from other countries, she prefers it over physical stores. The orders mainly include clothes and beauty products. Although she does her shopping from online, she never orders groceries from there. These are the one thing that she needs to shop for herself and choose the best products personally. She has good experience with parcel machines and usually picks up the parcel as soon as possible. The interview also revealed that the experience with the courier service has been rather negative, as it is annoying to wait for the courier and plan to be at home during the day. The main concern for her regarding the parcel delivery system was that the parcel machines are quite far away, and it would be great to have one closer to the residential area where she is living.

Appendix 2: Co-Design Workshop 1

EXERCISE 1

DESCRIPTION OF EXPECTATIONS

As a first step the participants were introduced to a last mile parcel process.

In a joint discussion, the participants mapped out the expectations that customers have for the delivery process.

INSIGHTS

- Customers would like to pick up the parcel as close to home as possible.

- Parcel pick up should be in every residential area.

- There should be a payment for delivery at the end of each month.

- The whole system should run through a single provider.

EXERCISE 2

WELL-BEING MAPPING

The poster used in the second exercise was divided into five different well-being categories.

Together, the participants filled in the well-being categories with the things that ensure their well-being.

INSIGHTS

- At a fast pace of life, it is important to take some time off.

- Being physically active is important for good health and mental well-being.

- Spending time outside is important but often tends to be forgotten.

- Communication with loved ones as well as meeting new people is very important for social well-being.

EXERCISE 3

WELL-BEING IN PARCEL DELIVERY

The last exercise was a combination of the first exercises, the participants had to think about the last mile parcel delivery service and map out the factors that negatively affect their well-being in that process.

INSIGHTS

- People become more closed because of the lack of need to leave home.

- Every day communication moves to social media, spontaneous communication with new people will suffer.

- An inactive lifestyle can lead to health problems.

Appendix 3: Co-Design Workshop 2

CONCEPT CREATION

Customers were first introduced to a small pre-story about the design brief to give an overview of the main objectives of the solution. This was followed by a discussion on the nature of the solution. To help with the progress of the work and to generate discussions, thematic questions were also posed on the basis of the business model canvas in order to guide the participants of the workshop to important thematic discussions. While discussing about the topics on the poster, the participants started to conceptualise the solution.

PRE-STORY

There is a central hub in each residential area, where all residents of the district can pick up their parcels and spend their free time communicating with their neighbours.

Residential areas have been built in the interests of its inhabitants and to promote their well-being. At the centre of each residential area is a gathering place that is close enough to each house that it is easy to walk there. The main purpose of the gathering

place is to store the packages ordered by the residents. Everyone's parcels come to the centre of the district, and residents can easily walk to pick up their parcel. In addition, the environment also facilitates communication with neighbours, as the pick-up point is also a nice place to spend time and communicate. The solution is supported by a platform that makes receiving the package more convenient, motivates to move and to communicate with neighbours.

What could the parcel pick up centre be like?

What could be the solution for how the packages are stored?

How to use this solution to motivate people to be more active and social?

What should the platform supporting the solution look like and what should it include?

INSIGHTS

- Linking parcel delivery to the community helps to make its existence more natural and thus a normal part of environment.

- In order to facilitate payment for the parcel delivery service, each customer must pay for the service once within a specified period of time.

- By creating a common environment, the neighbours might find likeminded people among themselves and lead to more meaningful relations.

- By getting to know their neighbours and the parents of neighbourhood children better, residents will feel more secure in their neighbourhood.

- Through the solution, adults will have a place to socialize, just as children have playgrounds in every neighbourhood.

- The solution will allow residents to take time off from daily activities.

- In order to promote well-being, it would be important to introduce gamification to the solution to engage more residents.

- The platform accompanying the solution should be primarily for the residential area and should also reflect the parcel logistics solution as an extra feature.