OSLOMET

Using Service Design to Bring Life to Abandoned Buildings and Brownfields in Liberec Region

ABSTRACT

This Master's thesis explores how the implementation of the 'Context for Experience' methodology can have a positive impact on the numerous brownfield locations in Czechia. According to the Czech National Brownfield Database, there are approximately 4,500 mapped brownfield locations identified by the CzechInvest agency. However, the actual number of such abandoned sites is expected to be twice as large and continues to grow. This means that Czechia, already densely populated, has countless unused locations that hold significant potential for sustainable urban development through land recycling.

While entities like CzechInvest are addressing the issue of brownfields in the Czech Republic, there are still areas that could benefit from the contribution of a product designer. The thesis outlines few and defines one as the main focus that is raising public awareness about brownfields to encourage stronger action from relevant authorities in dealing with nearby brownfield sites.
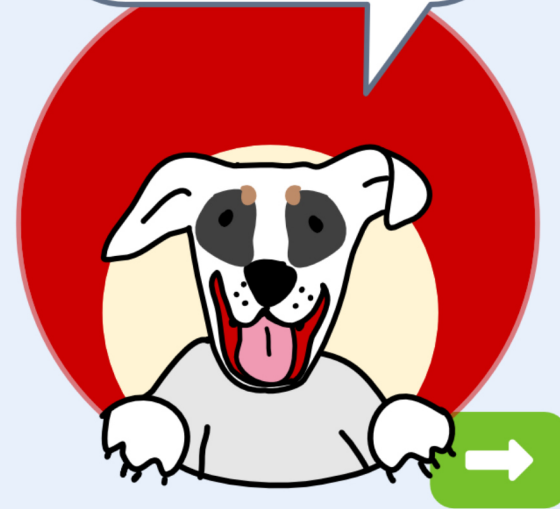
To accomplish this goal, the Context of Experience methodology is synthesized with other 'design for experience' approaches, including gamification and branding. This leads to the development of a gamified service based on the existing product, Mapy.cz. The proposed service consists of interconnected games that facilitate knowledge transfer about brownfields. The scope of the thesis includes three examples of such games, collectively demonstrating how this designed service can be introduced.

The first game, 'Catch the Brownfield,' serves as an introductory priming experience to the proposed solution while providing information to help users understand what constitutes a brownfield. The second game, 'One Man's Brownfield, Another Man's Treasure,' aims to familiarize users with the appearance of brownfields near their location. The third game features two levels, targeting different user groups within the Mapy.cz app. 'The Brownfield Quest' is designed for parents or caretakers and their children, providing a transmedia storytelling experience that incorporates various forms of interaction. The second user group for 'The Brownfield Quest' includes the rest of the Mapy.cz users, divided into categories based on their navigation preferences within the app. The overall goal of the third proposed game for both defined user groups is to send an email to a mayor about brownfields falling under the scope of his municipality.

Based on user testing, it was determined that this proposed service has the potential to serve as a tool for disseminating knowledge about brownfields while encouraging users to contribute to their revitalization efforts. The evaluation also suggests that, with appropriate modifications, this service could provide valuable benefits to other countries dealing with brownfield challenges.

CONTENT

1 INTRODUCTION

1.1. The cultural differences

This research project is the culmination of months of dedicated effort, including extensive research, insightful interviews, thought-provoking conversations, and a variety of other tools from a designer's toolkit. Yet, it all began with a deeply personal issue.

When I moved to Oslo in 2019, the originally old industrialized urban area Bjørvika in the city center was already partially changed, as the first element of the planned transformation, the Norwegian National Opera and Ballet (Brownfieldy - Český Krumlov, 2021), was already standing. Thanks to that I had the chance to experience for myself the identity that can be created by a sensible approach to site revitalization and urban catalysation. My experience in that location was further enriched by the opening of the new Oslo public library, Deichman Bjørvika *(Fig. 1)*, in June 2020 (Deichman Bjørvika Olso Public Library, 2022), and later by the unveiling of the new Munch museum in October 2021.

Although I did not experience the initial difference from the heavily industrialized location into a place where art meets everyday life, the changes with the opening of the two following elements of the planned transformation were from personal perspective very significant.

Suddenly the location became much more alive as up until then it was mainly tourists visiting the Opera house. Now there are people of all ages coming to the location with various intentions. Some examples are for instance parents going to the children's

department in the library, some are students going to study hidden in the library's complex segmented interior and some are elderly

Figure 1. View from the Deichman Bibliotek Bjørvika to the Opera and the sea

going to visit an exhibition at the museum. Then unexpectedly I was faced with the difficult task of moving back to my home country, the Czech Republic. The mere thought of leaving Oslo with its beautiful clean urban areas weighed heavily on my heart, and my despair only grew stronger when I visited Liberec, the city where I would soon reside.

While Liberec's old town is undoubtedly beautiful and picturesque, some may argue about what qualifies as true beauty as aesthetics is subjective (Saito, 2007). For me, the historic town square with its lovely isles and charming shops made it a beautiful place (Fig. 2). However, upon leaving the town square and walking only five minutes to the main bus station, called Fügnerova, everything became very industrial, functionalist, and shabby. Many buildings seem empty and some of them are in such a deteriorated state that they are starting to fall apart (Fig.3). Although there were observed and visited some inspiring revitalization projects, such as IGI community centrum in Vratislavice nad Nisou, that originally served as an apprentice school and was completely revitalized in 2021 ("O centru," 2021) (Fig. 4,5). However such project, although breathtaking, was seen as a very rare exception to the prevailing situation of buildings in rather bad shape.

Seeing the majority of buildings in such a dilapidated state compared to those in Norway left me wondering, "Why do most of the buildings here look so much older, uglier, and emptier? Why can't I see more of similar initiatives as the one at Bjørvika?" It was these questions that sparked my journey into the issue of abandoned buildings and ultimately led me to the focus of my master's project: the brownfield problematics.

To be able to leave Norway, I knew I had to have a plan. I could not simply sit by and do nothing. I had to find a way to change the current situation and make Liberec a more beautiful place outside of its city center so that I could be happy there as well. That's when I decided that I strive to find out how can I as a designer contribute to the current situation around the state of buildings in Liberec?

Figure 2. The beautiful old town of Liberec

Figure 3. Old and shabby buildings right by Fügnerova

Figure 4. IGI Centrum and it's extention, the new town library

Figure 5. Interiors of IGI Centrum

1.2. The initial assumption

After carefully observing the area, assumptions were made on the direction of the master project. The idea was to select an abandoned building in the city of Liberec and create a revitalization plan that was holistic in approach.

During conversations with fellow designers and architects, it was discovered that the design and architecture scene in the Czech Republic tends to be individualistic and competitive. This was not surprising based on personal experience from the bachelor studies at Czech Technical University in Prague. The education system at the time did not prioritize collaborative or interdisciplinary skills among students. Each semester, students would choose a studio based on

the topic announced for that period and work on it alone for the rest of the semester. Although group work was an option, it was not encouraged.

However, the approach to education at OsloMet was vastly different. While I can only speak from my own experience in the Master's Degree program *(Fig.6)*, conversations with fellow students and observations of their group work showed a different mindset. Norwegian students often preferred to work in groups rather than alone, while students in the Czech Republic were hesitant to discuss each other's projects for fear of their ideas being stolen.

While I do not wish to draw any definitive conclusions as to do so gaining a deeper understanding of the complex systems that encompass development, construction, architecture, design, and more fields in both Czechia and Norway would be necessary. Nonetheless, my current understanding of the situation inspired the initial plans for my master project, which involved applying a participatory approach to the revitalization of the selected building. The idea for such an approach arose from an online webinar where Laurie Vestøl presented her project of Urban Space Lab that is focusing on the "co-production of sustainable cities with improved well being" (Laurie Vestøl). Her opinion aligns with the consumer product attachment strategies (Mugge, 2007) as she navigates people to participate in building the projects so they have a feeling of ownership to the place (Laurie Vestøl, 2022). Such an approach is also described as crucial by the section ACTION N° 04 of the Urban Agenda for the EU Partnership on Culture / Cultural Heritage Final Action Plan as The management of territorial and urban assets through bottom-up/collaborative approaches can help local actors enhance their Cultural Heritage, strengthen local identity, and contribute to the preservation and/or redevelopment of their heritage[...]. The participation of the local population is crucial and can have a beneficial impact on several social issues (i.e. the integration of migrants). (Urban Agenda for the EU Partnership on Culture / Cultural Heritage Final Action Plan, 2020)

The aim was to create a collaborative effort by bringing together experts in fields such as engineering, architecture, and urban development, along with students from the Technical University of Liberec and the high school in Kateřinky, who specialized in interior design, carpentry, and upholstery. The idea was to provide value to all stakeholders involved. Experts could witness the potential of students in action and even identify future employees, while students could gain hands-on experience and make valuable connections, stepping out of the safe school environment and into the real world. From a sustainability perspective, this participatory approach has a higher likelihood of success and public utilization since the students have a personal connection to it, making the project more feasible and beneficial for all (Urban Agenda for the EU Partnership on Culture / Cultural Heritage Final Action Plan, 2020).

Although there certainly is a value to this idea and it would most likely be a contribution to Czech society as such inclusion is most likely not common in the Czech urban development approaches, the probability of actually performing such a plan in real life afterwards was, based on findings, evaluated to be very low. Nonetheless as it will be described further in the thesis, throughout the initial research there appeared more pressing areas where the product designer's interference was perceived more impactful.

Figure 6. A group designing project at OsloMet

1.3. Brownfield problematics

The definition of a brownfield versus an abandoned building is multifaceted and will be further explained in the brownfield definition section. However, it is important to note that brownfields can refer to various types of land with diverse past uses, not just industrial buildings, as many people mistakenly assume (CzechInvest, 2019). The primary challenge with brownfields is that they require some sort of revitalization before they can be utilized (Baloun, 2023) while utilizing urbanized land is critical for preserving Czechia's diversity and aligning with the Paris Agreement, as explained in the "The Need in Society" section of this project (Paris Agreement, 2015).

Since the discussed problematics is a global issue and many countries created various tools and mechanisms to deal with brownfields, from a systemic standpoint the issue can be considered a social problem. Social problems are defined by going against the values of a significant number of people who believe action is necessary to address the situation (Rubington & Weinberg, 2011).Taking that into account, we can also state that brownfields can be classified as a wicked problem, given their intricate and interconnected nature (Wong, 2022). Wicked problems lack clear aims and solutions and are constrained by real-world factors, making risk-free attempts to solve them nearly impossible.

These factors predefine that this thesis does not provide a solution to the brownfield problematics, it merely affords suggestions hoping to change the situation towards better, but expecting that by implementing suggested product, such change will inevitably produce other undesirable side effects as that is how wicked problems behave (Wong, 2022).

Figure 7. Brownfield called 'Textilana' in Liberec - former textile factory

2.1. The research question

How can the use of 'Context of Experience' design methodology approach contribute to a change in the current brownfield situation in the Czech Republic?

2.2. The two parts of designer's preparation

In order to deliver a high-quality project, I believe that each designer has their own unique perspective on how to achieve this goal. Drawing on my personal experience from five years of design education in combination with the approach being selected to positively contribute to the defined research question, I divided the planning phase of my project into two distinct parts: "Planning for the process" and "Planning the process itself."

2.2.1. Planning for the process - Double diamond adjustment

The process of problem-solving and finding innovative solutions is a vital aspect of any project, and this particular endeavor was no exception. To facilitate this creative journey, the British Design Council introduced the concept of the Double Diamond, a valuable framework that empowers designers to structure their thinking and enhance the creative process (Costa, 2018). Given the research question's specific focus on addressing the challenges surrounding brownfields through the application of the 'Context of Experience' framework, it was a deliberate and thoughtful decision for a Master student of Product Design to adopt the Double Diamond as the primary planning method. Careful adaptations were made to tailor it to the unique requirements of this project, and the visualization of the Design Thinking Framework was employed to emphasize the distinct focus of each stage (Appendix p. 2) and ensure consistent application of Human-Centered Design approaches (Giacomin, 2014).

2.2.2. Planning for the process itself - The journey from an abandoned building to a brownfield by the utilization of the Design Thinking Framework

Drawing on the insights gained from my studies in product design, I have identified the necessary steps to develop a comprehensive understanding of the context and address the research question effectively. The project began by exploring a personal perspective on urban environments described in the introduction, which served as the foundation for the core focus of the project: people and their experiences with brownfield problematics. To ensure a holistic approach that prioritizes the needs of individuals, I adopted the principles of Human-Centered Design (HCD) (Yu, 2023). Guided by this approach, the chosen framework for the project is the design thinking framework, which aligns with HCD practices (Yu, 2023). This framework encompasses five key stages:

Empathize; The initial research to understand the Brownfield problematics
Define; Outlining the problematic areas that would benefit from a designers interference
Ideate; Processes to produce ideas for the product development
Prototype; Designing the product
Test; Testing the product
(Coursera, no)

Additional part extracted from HCD approaches (Guide, no) that is recommended for a future continuation of the project to higher the value of the final solution:

Iterate; Evaluation of the results from the testing phase and based on newly gained knowledge repeating the Ideate, Prototype and Test phase.

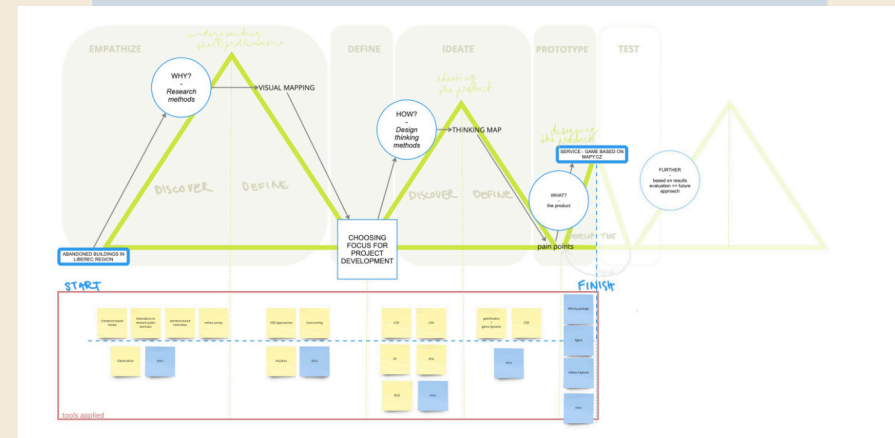This method was chosen as it logically divides the actions that were

Figure 8. Final synthesis of the Double Diamond personalization

implementation of the design thinking framework into the double diamond framework in combination with design thinking methods and tools, that were applied in each stage, is visualized in the *figure 8* (Appendix p. 3). However, as the topic of brownfields problematics is a complex issue and to explain it one must often jump from one phase or a method to another the thesis does not utilize the phases of the design thinking framework as structuring element.

As it was mentioned in the introduction section, the initial idea focused on abandoned buildings. The research then started with sentences such as "Why so many abandoned buildings?" "History behind abandoned buildings?" etc which navigated towards the Prázdné domy database (Zeman, 2022) and the online interview with the founder of Prázdné domy, Petr Zeman. Among other he deepened the initial understanding of the basics such as that it is illegal to enter an abandoned building in Czechia, or that there exists a movement called URBEX connected to abandoned places (Zeman, 2019). However, as the research continued, through an international student group the focus shifted towards baukultur and its suggestions on enhancing the quality of life through the baukultur approaches application and the importance of revitalization (Baukultur Report, City and Village, 2016/17) and only after that, by the continuation of the empathize phase and methods utilized, it landed with the term brownfield.

2.2.2.1. The need in society

Literature review (Muratovski, 2016b) was perceived as an important starting point during the empathize phase because for contributing to any topic, one needs to know what concepts have been used and what has been done before. The intention was to understand the reason behind the current brownfields and abandoned buildings situation. Thus, the research was first aimed towards the understanding of historical aspects and events in connection to buildings, construction and architecture. As a part of this phase I also went through available studies In the research room of the National Heritage Institute (territorial expert workplace in Liberec) and the outcomes of the scientific research task "Expert knowledge, research, scientific evaluation, inventory and documentation of the architectural heritage of the 19th and 20th centuries'' which was conducted in the Liberec region (screeny z toho dokumentu). There was also attended a seminar titled 'Brownfields a Greenfields Libereckého Kraje' (Brownfields a Greenfields Libereckého Kraje, 2023) that assisted in evaluation of the to date findings and expand the knowledge even further.

2.2.2.2. User involvement

The initial idea was to utilize all the resources available including both professionals and students in a participative approach, combining their strengths and weaknesses in order to come up with such a solution that would be truly appreciated and used. However, that was based on many assumptions such as that it would always be beneficial to have new community centers and that renovating an abandoned building is what people strive for. Then as the research continued the holistic approach shifted so that people are seen already in the beginning. Are they even aware about how many abandoned buildings and brownfields there are? Do they care? Why? If so, have they ever done anything in order to change what they didn't like?

To start with the user oriented research in the empathize phase first it was necessary to sign the project up for the SIKT approval (SIKT, 2023) in order to ethically present resources for gathered data through interviews (Appendix p. 4-21). There is a similar entity in Czechia which is The Office for Personal Data Protection ("Úřad pro ochranu osobních údajů," no) and the guidelines are defined by the European Union. It differs from the Norwegian approach as the Czech guidelines do not require any approval for the scope of this project. There are predefined rules by law that do need to be followed but to notify the data protection office, it is based solely on one's assessment ("Úřad pro ochranu osobních údajů," no).

After receiving the approval, the research continued by four semi structured interviews (Muratovski, 2016b) that contributed to the qualitative part of the research (Appendix p.22) and an online survey with 72 participants which added to the quantitative measure of the diploma project (Appendix p.24). All these led to a deeper understanding of the problematics from the perspective of the stakeholders included in the system. The empathize part of the research lead to highlighting some problematic area of the system. Following was the define phase of the design thinking framework in which the problematic areas of the Brownfield system in Czechia were evaluated and few were chosen as the focus of this master project. For the define phase was applied a card sorting method (Hanington & Martin, 2018) which assisted in sorting the volume of information gathered through the interviews and highlighted the heat areas relevant to this research project. Second approach applied in this state of the project was intuition as it can be perceived as an "ability that may be learned through experiential practice"(Faste, 2017). Since this thesis is the final project of Master studies, thus it should display the experiences gained through five years of study, it was perceived as a relevant representation of my abilities. Intuition was applied throughout the whole project as a guiding tool however in this section it was applied while selecting the final areas of focus for product development.

Based on the chosen focus area the process continued to Ideate phase which included the Crazy Eights method (Coursera, no). To further develop the ideation process, there were utilized Consumer Product Attachment strategies, which helped to evaluate the ideas generated during the crazy eights brainstorming exercise and shift the focus from problems to potential solutions (Mugge, 2007).

To gain a deeper understanding about the behavior of the general public regarding brownfields, the BCD method was seen as most suitable (Gulden & Berg, 2011) since it was proven while utilizing it few times during the studies that it provides a sort of uncanny thinking that is hard to achieve without it. This thinking can not only assist in the understanding of the behavior, it can also initiate new direction in the Ideate phase.

2.3. Systemic approach

The research further progressed by employing the systematic approach of systems thinking, through application of ZIP analysis (Sevaldson, 2022b) into a created thinking map (Appendix p.26) with the intention to highlight points that either represent a window for innovation, carry potential in the system or locations that would benefit from deeper research. Following was the encompassing of an analysis of systemic relations and impacts at various societal levels: Macro, Meso, and Micro scales. This enabled the creation of a visual map (Sevaldson, 2022a) that aimed to elucidate the intricacies of the system (Appendix p. 25). The map was designed as a valuable tool for the designing process, allowing to potentially pinpoint areas where the designers contribution would have the greatest impact. This approach directly aligned with the objectives stated in the research question as for the COE to be utilized, one must first know where to utilize it. Applied were also the leverage

points defined by Donella Meadows (Meadows, 2008d) *(fig. 9)* and the Iceberg Model (Goodman, 2002) *(fig. 10)* in order to understand the systemic structure for the proposed solution.
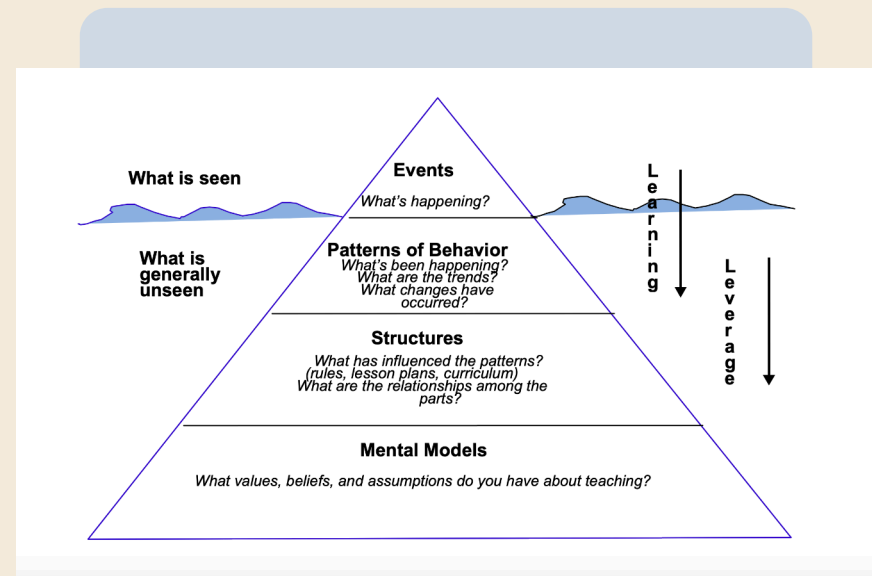

Figure 9. Adapted from The Iceberg Model by M. Goodman, 2002; source: https://files.ascd.org/staticfiles/ascd/pdf/journals/ed_lead/el200910_kohm_iceberg.pdf

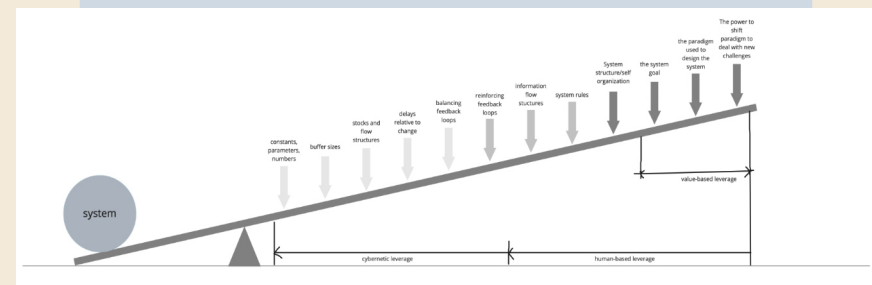

Figure 10. Ladder of leverage points defined by Donella meadows

3 DEVELOPING THE SERVICE
From an understanding to an idea

Given the intricacies surrounding the topic of brownfields and the need to navigate through various phases and methods to effectively address it, the thesis does not adopt the design thinking framework as a structuring element. This approach allows for a more fluid exploration of the complex problem at hand.

3.1. The need in society, history and sustainability measure of the issue

The presentation of societal needs and the focus on sustainability in relation to brownfield issues directly aligns with the research question. This connection is crucial because, without a comprehensive understanding as outlined in this chapter, designers would struggle to make meaningful contributions to addressing brownfield challenges. In order to develop a valuable product, designers must have a deep understanding of the context they are designing for, and this understanding forms the foundation for effecting change in the brownfield situation.

Currently, there is 12 million people living in Czechia ("Population of the Czech Republic," 2022) yet the size of Czechia is approximately one fourth of the size of Norway, which currently has around 5,5 million inhabitants ("Population," 2023). Although the density of inhabitants in Norway belongs only to the lower side of the scale, not the lowest, and Czechia does not have the highest one in the world either, from having the opportunity to live in both places I can without doubt say that one can definitely feel the difference. There is 118,1 people more per one km² in Czechia than in Norway, yet there are according to the National Brownfield Database around 4,5 thousand brownfield locations that are

mapped out by the CzechInvest agency (CzechInvest, 2007 - now), and according to their words the real number of such abandoned locations is twice as big and still growing (Petr, 2023). There are initiatives and mechanisms to contribute to the brownfield revitalization, yet the successfully revitalized brownfields are still more of an exception.

On the surface, Czechia feels so much more crowded. You have a town next to a town, and compared to Norway, there is not much wilderness left. The country feels domesticated without any identity of its own. That is the subjective part and not everyone would perceive the situation the same as I do. However, the objective part is that Czechia is running out of free land for people to purchase and to build their house on it. Of course, there are still remote places, but those aren't particularly attractive for young people to move into as their socioeconomic standard isn't high enough. Example of such a place could be the Sudetes area. This situation leads to a rising price in real estate, forbidding more and more people to buy their own property (Baloun, 2023). There are many angles from which one can approach this rising problem. Currently the population growth in Czechia is slowing down. The assumptions from the global perspective regarding the growing population are that in 2050 or later, the population growth will stabilize at 10 -11 milliards. Later on, it will start decreasing as the mortality rate will exceed the birth rate (Storch, 2022). By applying logical thinking, it is plausible that the need for free land for the population to expand to might no longer be prevailing. The building stock in the Czech Republic *(fig. 11)* then can potentially exceed the demand and more brownfields and abandoned buildings can appear. That is one of the reasons I believe it is necessary to utilize already urbanized land instead of taking up more greenfields.

The sustainability aspect of the current trend in Europe where only 13,5% of the land consumption accounts for land recycling ("Land recycling and densification," 2021) only contributes to the global decrease of biodiversity, which is in direct conflict with the 15th goal of the Sustainable Development Goals as biodiversity, among other, provides resilience to climate change ("Sustainable Development Goals," 2015) *(fig. 12)*. Also, in sustainable society, "nature is not subject to systematically increasing degradation by physical means" as the 3rd sustainability principle states (Robert et al., 2019) so the current trend is in conflict with the sustainability principles as well.
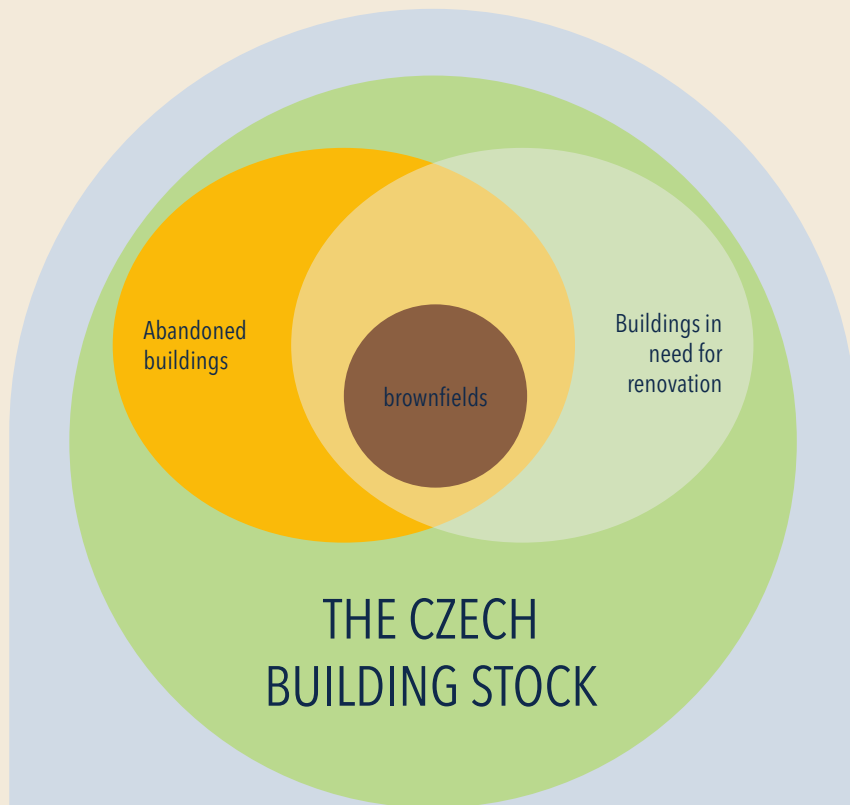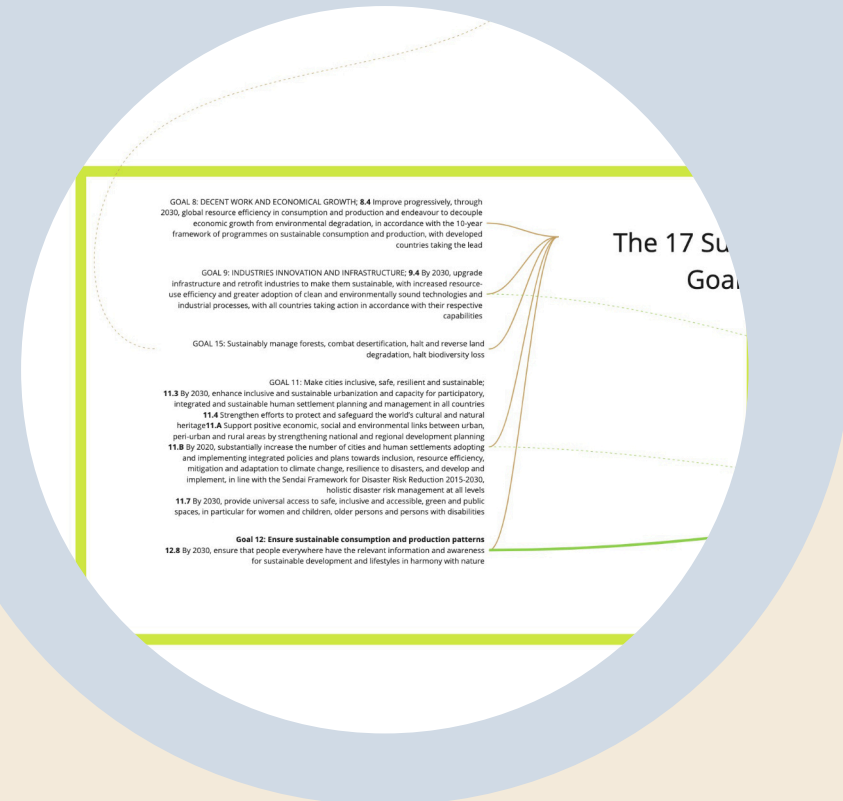

Figure 11. *Vizualisation of the Czech building stock; estimated representation of each category based on the findings*

3.2. The brownfield definition and main brownfield divisions

Gaining knowledge about brownfields and their defining characteristics was instrumental in helping the designer gain a more nuanced and comprehensive understanding of brownfield issues in Czechia. This chapter also provided critical supporting information that underlined the significance of intervening in the current brownfield situation through potential product development. The findings from this chapter were then utilized to inform the subsequent product development phase, hence the designers utilization of the COE as the research question states.

3.2.1 The Brownfield definition

The outcomes of the initial empathize phase and the research methods applied, reveal that there is no singular, universally accepted definition of brownfields, and each country has its own interpretation of what constitutes a brownfield (Petr, 2023). Furthermore, even within a single country, the understanding of brownfields can vary depending on the specific needs and requirements for defining them (as indicated by an old website of the CzechInvest agency). Additionally, there is no existing comprehensive database that covers brownfields across all European Union countries. This lack of centralized information further complicates the brownfield issue, as there is no precise count of the total number of brownfields under consideration. While some countries have attempted to map out the situation within their borders, the absence of a unified brownfield definition means that what may be classified as a brownfield in Austria, for example, may not necessarily be recognized as such in Czechia (Petr, 2023)

3.2.1.1 In Czechia

As I started with literature based research in January, there was a page designated to brownfield problematics under the CzechInvest website, however it did not cover all the necessary information regarding brownfields which were to be found on different websites over the internet. Also, it included more brownfield definitions as there are other entities with different needs as hinted in the beginning of this section. For example, the Ministry of Regional Development's brownfield definition was: "Brownfield areas are areas which are not currently used for their original purpose or are not used at all, they are often located in the built-up area and represent a significant potential for their further use." (An old website of the CzechInvest agency). And the one from the Ministry of the Environment of the Czech Republic was that: "A brownfield is a plot of land, a building or its part, an area or
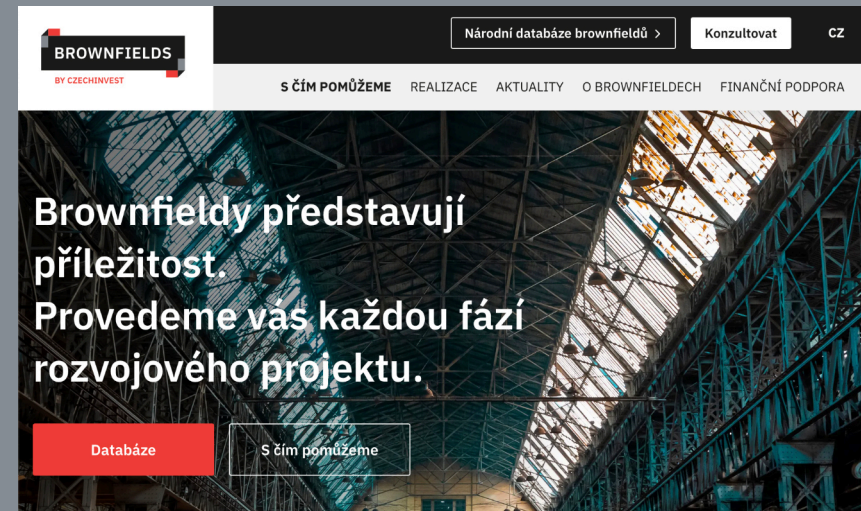

Figure 13. New website designated to brownfields in Czechia; source: www.brownfieldy.cz

territory, including underground and other areas, that was previously used for industrial, agricultural, military or other activities, and where there is a reasonable suspicion of contamination of the soil or groundwater, air pollution or other environmental damage, which could complicate or prevent its further use" (An old website of the CzechInvest agency).

As one can see the base of the definitions does speak of the same; area/land/property that is not being used. However reading further one can notice the differences that significantly alter what buildings can and cannot be marked as a brownfield, which led to a confusion within the society (Baloun, 2023) depicted in a following exemplary situation; an owner of an old and empty building read about its potential and the brownfield definition at the Ministry of Regional Development's website and then wanted to sign the building up for the national Brownfield database.

However, when he reached out to the CzechInvest agency he was told that his building does not fulfill the aspects of a brownfield thus cannot be signed to the database. That is one of the reasons (Baloun, 2023) a new website was created (CzechInvest, 2023) *(fig.13)* and launched in the middle of April in 2023 ("MPO a CzechInvest spustily nový web o brownfieldech v České republice," 2023) with only one brownfield definition defined by the National Strategy for Brownfield Regeneration (CzechInvest, 2019); "a property (territory, area, land, object) that is unused, neglected and may even be contaminated. It arises as a residue of industrial, agricultural, residential, military or other activity. Brownfield cannot be used appropriately and efficiently without the process of its regeneration. This is a general definition. Individual parameters of brownfields can be specified for the purposes of brownfield mapping, use in subsidy programs or territorial measures (for example, minimum brownfield area, rate of non-use, period of non-use of the property, etc.)"

3.2.1.2 Internationally

Earlier, there was discussed the lack of a unified definition for brownfields, and how each country may have its own approach. In fact, many national Architectural Policy documents touch upon brownfield redevelopment. For example, the Norwegian Architectural Policy from 2009 notes that pilot projects have demonstrated the importance of renovating, developing, and utilizing existing buildings and built environments (Norwegian Architectural Policy, 2009).
Austria provides another example of the differences in defining what constitutes a brownfield. There a building that has been abandoned for two years is considered a brownfield (Petr, 2023), whereas in the Czech Republic, a building must be in a state of disrepair and unusable without revitalization to be classified as a brownfield (CzechInvest, 2019).

The literature review research also showed that at the European

level, efforts are being made to address brownfield redevelopment. For example, the "Guidebook to European Building Policy" aims to renovate 90% of the buildings in the European building stock, including brownfields, to achieve the net-zero goal set by the United Nations (Fabbri, Glicker, Schmatzberger, & Roscini, 2020). The European Commission also held a conference in 2019 on "Brownfield Redevelopment in the EU" to encourage the sustainable use of brownfields and protect the environment and human health ("Brownfield redevelopment in the EU," 2019). Additionally, the Cultural Heritage Final Action Plan includes a focus on innovative reuse of abandoned buildings and open spaces (Urban Agenda for the EU Partnership on Culture / Cultural Heritage Final Action Plan, 2020), while member states of the EU receive funds for brownfield regeneration (Baloun, 2023). However, research on EU brownfield regulations and information can be challenging due to the lack of a unified approach. Despite this, the European Environment Agency's website offers a wealth of information on brownfields.

In general all over the world there are countless articles and reports, such as the EEA Report No 17/2021(Land take and land degradation in functional urban areas, 2022), "Evaluation model of the economic-environmental impact on housing recovery. Application in the city of Seville, Spain" (Alba-Rodriguez, Marrero, & Solis-Guzm, 2022), and "Remediated Sites and Brownfields. Success Stories in Europe" (Paya Perez, 2016) and more, that defines the term brownfield and emphasizes the importance of land recycling and brownfield revitalization from various perspectives.

3.2.2 Types of brownfields

There can be outlined many ways of how to divide brownfields. However, for the purposes of this master theses it was perceived relevant to define presented categories. Other ways of how one can divide brownfields can be for example by their size, or the urban structure (Kopalová, 2009).

3.2.2.1 Division according to their original purpose

Based on the National Brownfield database (CzechInvest, 2007 - now) there are several categories defining the original purpose of the buildings defined as brownfields nowadays. The categories defined with the percentage depicting the amount of brownfield in chosen category considering the total number of mapped out brownfields to be the reference *(fig. 14)*:

Housing 5,1%
Agriculture 28,6%
Military areas, barracks, shooting ranges 6,1%
Industry 29,7%
Civic amenities 16,8%
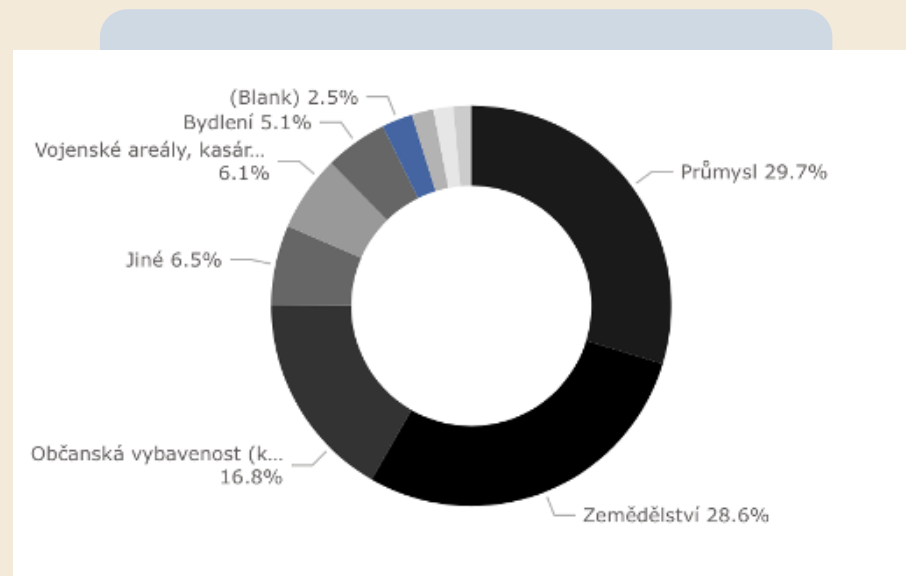-
Mining of raw materials
Transport
Tourism
Other

Figure 14. Vizualisation of the percentages representing the number of brownfields under each; source: https://www.brownfieldy.cz/o-brownfieldech/

3.2.2.2 Division based on the economic feasibility of regeneration

In simple terms, this category represents the level of ease or difficulty in revitalizing brownfields from an economic feasibility perspective. The significance of presenting these categories lies primarily in categories B and C, as they pose challenges or are nearly impossible for private investors to fund. Consequently, the responsibility for revitalizing these brownfields falls upon the municipalities they belong to or the government at large. To initiate the revitalization of a brownfield, municipalities must seek funding since the financial resources required far exceed the budget capacities of most, if not all, municipalities. This also entails that some of those municipalities that at least have an awareness about the brownfield problematics, might choose to avoid the hassle it inevitably includes and focus on using the available budget to invest into a different area providing the municipality with for example new pavement instead of the borwnfield revitalization (Baloun, 2023) This emphasizes the crucial role of the designer, as they can develop a service that activates the general public living around brownfields, including those in categories B and C. Through the proposed service, the designer can initiate and contribute to the revitalization efforts, aligning with the objectives outlined in the research question. Data were gathered from a guidebook for investors that intend to invest into brownfields (2019);

Category A
From the economical perspective Brownfields falling into this category are those that require minimal intervention, have low economic burdens, offer high economic benefits, and are strategically located with simple ownership structures and little pollution, making them attractive to potential investors.

Category B

Brownfields falling into this category are those that are difficult for private investors to fund due to their pollution levels and low profitability. To make these sites attractive for investment, public and private financing is required to cover the cost gap. The goal is to convert these "type B" brownfields into "type A" brownfields in the most cost-effective way possible. Local and regional governments should focus on these sites, and public support is necessary to create investable projects and partnerships for development.

Category C

Type C brownfields are located in inaccessible areas and require costly remediation due to previous ecological burdens. These sites are unprofitable for the private sector and often pose threats to health and the environment. The public sector is crucial in these cases for the site's reuse. Converting Type C to Type B may be necessary to unblock future development, but a strong social reason is required.

3.2.3 The Czech National Brownfields Database and a history of their mapping

It is also essential to touch upon the National database itself, as it highlights another aspect of the incomplete system surrounding brownfields in the Czech Republic. The first attempt to map out brownfields as depicted in (*Fig.15)* happened in 2007 when the CzechInvest asked the region's representatives to map out brownfields in their region (Baloun, 2023).
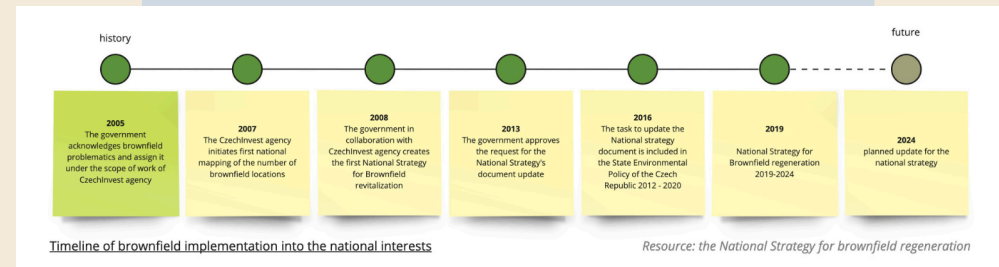

Figure 15. Vizualisation of the historical milestones in the mapping of brownfields in the Czech Republic; Appendix p. 29

However, there were some regulations to which regions could map out the brownfields and one of the deciding elements was the Gross Domestic Product (GDP) of each region. The reason for doing so lay in the division based on the economic feasibility described in the previous section. It was expected that regions with high GDP have brownfields mostly in the A category thus the market alone can take care of them (Baloun, 2023). However this decision only led to an incomplete database that was not sufficient for anyone (Petr, 2023).

The reason behind this database's existence is that it on one hand has an informative purpose for the government to keep track of how many of such locations are there in the Czech Republic. For that the database has a non-public part in addition to the public one. On the other hand it is utilized by the CzechInvest agency as a showcasing tool of investment opportunities of Czech and international investors (Baloun, 2023)

Currently the database covers around 4 400 brownfields, however that is expected to be only around a half compared to the expected real number (Petr, 2023) and the explanation for it is that up until today, the brownfields were added manually, thus slowly, to the database as they were needed to be assessed first by geographers and spatial planners (Baloun, 2023) which in itself can be considered system buffer as it creates a great delay in the system (Meadows, 2008c). The Director of Business Localization in the CzechInvest Radovan Baloun however stated in an interview, that the next step of the new website is including a data model to the National database called CIS (central integration system). That will automatically gather already existing data on the Czech Republic, spatial planning, the business environment, the environment and so on which would speed up the mapping process (Baloun, 2023).

It is important to mention that there also exists another database covering abandoned buildings in the Czech Republic called Prázdné Domy (Zeman, 2022) already highlighted in this project. However according to Radovan Baloun it is not a reliable resource regarding brownfields or abandoned buildings as there is no system ensuring that objects listed in the database are in fact what they are presented to be (Baloun, 2023) since it is an open database and anyone can make a new entry (Zeman, 2019). For that reason this database was not taken into consideration as a resource.

3.2.4 Understanding the system

3.2.4.1 The stakeholders

Since we are dealing with a wicked problem (Wong, 2022), there are countless stakeholders with an interest in the brownfield problematics and as giga-mapping ("What is Gigamapping?," 2022) was not the focus of this project, there were identified only few that were seen as the most crucial regarding the HCD approach and the scope of this thesis. There are outlined more stakeholders connected to the system in the *Figure 16*, however it is expected that even the presented map does not cover nearly all the relevant entities thus the creation of a proper giga map is recommended for the potential future continuation of this project.

The CzechInvest agency

The CzechInvest agency, established in 1992 under the Ministry of Industry and Trade, is a state-funded organization that specializes in business support and investment facilitation. Apart from attracting foreign investment, it also has departments that focus on regional development and offer free counseling for investment-related issues (CzechInvest, no). Since 2007, CzechInvest has been responsible for addressing the brownfield problematics in the country and is the key player in this area. They act as mediators between interested entities and provide consultation, manage the National Brownfield Database, and determine which projects are eligible for funding from the public sector which covers funds from the state or the EU (Baloun, 2023).

The overall goal of CzechInvest in connection to brownfields is to revitalize as many of them as possible. To achieve this, there are sub-goals that aim to make it a well-known entity among the general public. By doing so, CzechInvest seeks to establish itself as

the go-to source of information about brownfields to which their newly published website www.brownfieldy.cz is to assist. Additionally, they hope to become a regular presence in negotiations between municipalities, owners, and investors as a mediator (Baloun, 2023).
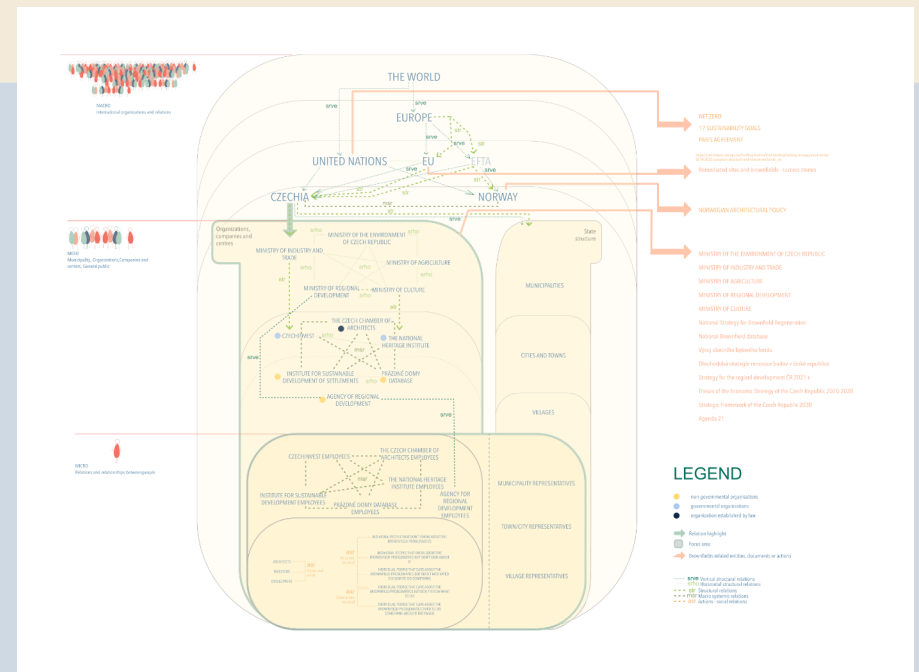

Figure 16. The visual map of systemic relations depicted in the societal levels division of the system's stakeholders; Appendix p.25

Municipalities and their representatives

As the term brownfield is currently not defined by the Building law of Czech Republic nor there is any definition in the decree on spatial analytical documents nr. 13/2018 Sb. ("Vyhláška č. 13/2018 Sb.," 2018) the Municipalities are the deciding entities in the final say with urban planning (Baloun, 2023). That means that regardless of the intention of an owner nor investor, if the municipality does not agree with the business plan or anything in connection to the brownfield revitalization, the revitalization will not take place. The government did however approve some changes to the building law recently and apparently there will be a new decree on the spatial analytical documents coming in the beginning of July 2023 ("Vyhláška č. 13/2018 Sb.," 2018), however according to Radovan Baloun there still won't be any definition of the brownfield term (Baloun, 2023).

"The goal of municipalities is to make as much money as possible for its development" (Baloun, 2023)

Private owners of brownfields

Looking at the statistics from the National Brownfield Database *(Fig.17)*, it is clear that the majority of brownfields, more specifically 60,9% are privately owned. To fully understand the system around brownfields in Czechia, it is important to consider all stakeholders involved, thus also including the private owners as their involvement in the system is crucial for a comprehensive understanding of its functioning.

"The goal of the private owner is to make as much money as possible from the sale of the site" (Baloun, 2023).

General public

The general public plays a crucial role in brownfield revitalization, as they were also identified as stakeholders through the extensive research and analysis. While public funds, such as the Zelená úsporám program ("Nová Zelená Úsporám," 2021), are available for individuals,
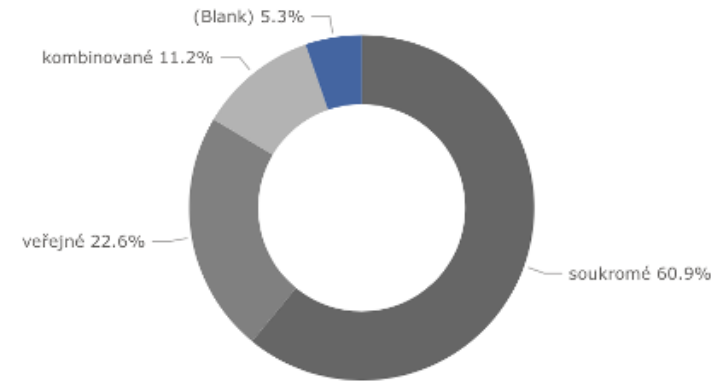

Figure 17. Visualisation of the type of a brownfield ownership in Czechia; source:https://www.brownfieldy.cz/o-brownfieldech/

they generally do not provide enough resources to tackle large-scale brownfield renovations. To be more specific, Zelená úsporám is a programme of the Ministry of the Environment administered by the State Environmental Fund of the Czech Republic financed by the European Union that focuses on energy savings in family and apartment buildings ("Nová Zelená Úsporám," 2021). These funds focus on the support of the Czech building stock renovation which is in alignment with the Guidebook to European Building Policy (Fabbri et al., 2020). The average amount of money received through the Zelená Úsporám accounts for 189 thousand CZK ("Nová Zelená Úsporám," 2021) however brownfield renovation usually lays in tens of millions CZK (Kysela, 2023) so simply put it is nearly impossible for a private person to successfully renovate a brownfield. However, the general public's influence extends beyond financial support, as they are the reason for the existence of brownfields and have a significant impact on municipal and state elections. Although some may not be passionate about brownfield revitalization, many are, but struggle to find financial backing, as investors tend to prefer company projects over private initiatives (Kašparová, 2023). Crowdfunding is a possible option, but investor Tomáš Kysela suggests that the Czech society is wary of it due to previous negative experiences (Kysela, 2023).

3.2.4.2 The systems dynamics

Although the core of brownfield problematics is a set of things, in this case brownfields, they are not interconnected in a way that would produce any pattern or behavior (Meadows, 2008b). For that reason brownfields alone are not a system - if you change one or take one away it does not affect the other brownfields directly.

They are merely a component within larger systems that are connected to them. For instance, microorganisms within a newly established plant that grew in an abandoned brownfield or the functioning of organizations like CzechInvest are systems that are intricately connected to brownfields. Moreover, brownfields represent a substantial portion of the urban structure, making them an integral component of a larger, interconnected system. In that case, the removal or modification of a single brownfield will have ripple effects on the broader urban ecosystem.

Also, brownfields can be seen as a side effect of different yet in a way poorly constructed system(s). They could for example be a representation of a systems trap called 'The Policy Resistance' as there are various actors with differentiating goals (Meadows, 2008d) described under each stakeholder paragraph in chapter 3.2.4.1 . Although the state is trying to diminish the number of brownfields through the activities of the CzechInvest agency, the goal of the brownfield owners is to gain as much value out of them. The state has the resources to define the value of each brownfield and often their assessment can be quite disappointing for the owners, leading to their resistance in selling the locations as they would loose out on potential profits they still believe their brownfield possesses. And that is just one of the dynamics that are there between the stakeholders.

As we are talking about a so-called wicked problem, it is basically impossible to highlight what are all the systems that need to be adjusted in order to erase existing brownfields and prevent new ones from appearing. Based on the initial research it can be assumed that relevant systems connected to brownfields problematics and potentially contributing to it are urban development and construction law. Nonetheless it is also crucial to say that most likely, based on the leverage points described by Donella Meadows *(fig. 18)*, society in general as a system has something to do with it, since the Czech society's structure is democratic thus all needs to be done ethically and with everyone's approval. The structure of a system lies in the human based leverage area of the system which is one of the most impactful ones (Meadows, 2008d).

To better explain what I mean can be done with an example. Imagine changing the chosen leverage point from democracy to dictatorship. Then if the dictator's only interest was in restoring brownfields and preventing them from appearing there would most likely be nothing for me to write about in this thesis. That however does not mean that the dictatorship regime would be better than democracy! In accordance with the wicked problems there is only a better or worse option (Rittel & Webber, 1973). And in this case democracy might be worse for dealing with brownfield problematics, but based on lessons learned from historical events, it is most likely better for society.

A visual map inspired by giga-mapping ("What is Gigamapping?," 2022) practices was created (Appendix p.25) to better understand how the entities in the system are interconnected. This map *(fig. 19)* presents the structure of the system from a Macro to Micro perspective and clarifies the otherwise complex volume of stakeholders and their positions within the system. The inter-systemic relations (Sevaldson, 2022) highlighted in the map contributed to understanding the connections between the individual entities. Most beneficial is perceived to be the "Actions - social relations" at the micro level as they assisted in directing the focus on desired user groups for the product development - phase prototype from the design thinking framework.

Important to mention that the brownfield stock is not still. With every change in the society there are new brownfields appearing. To be more specific, currently there is an energetic crisis and we are as a society moving towards more sustainable energy resources. For that reason, it can be expected that many of the new brownfields appearing in the upcoming years will be the residue sites of coal mining.
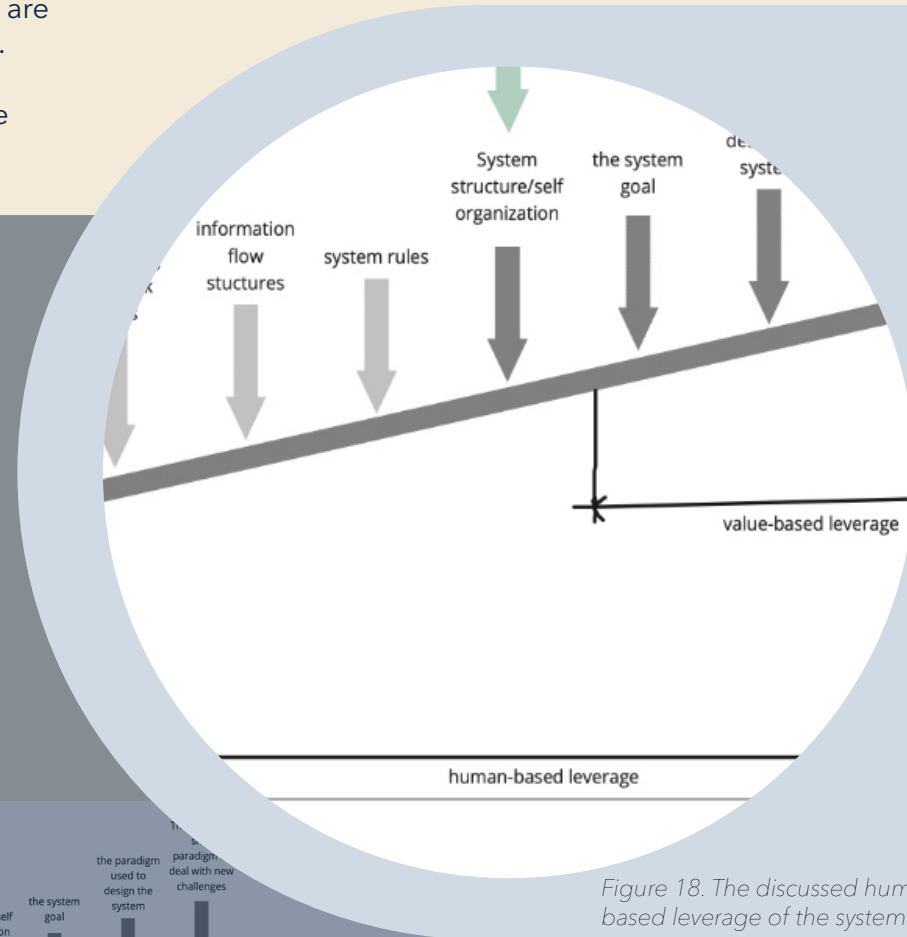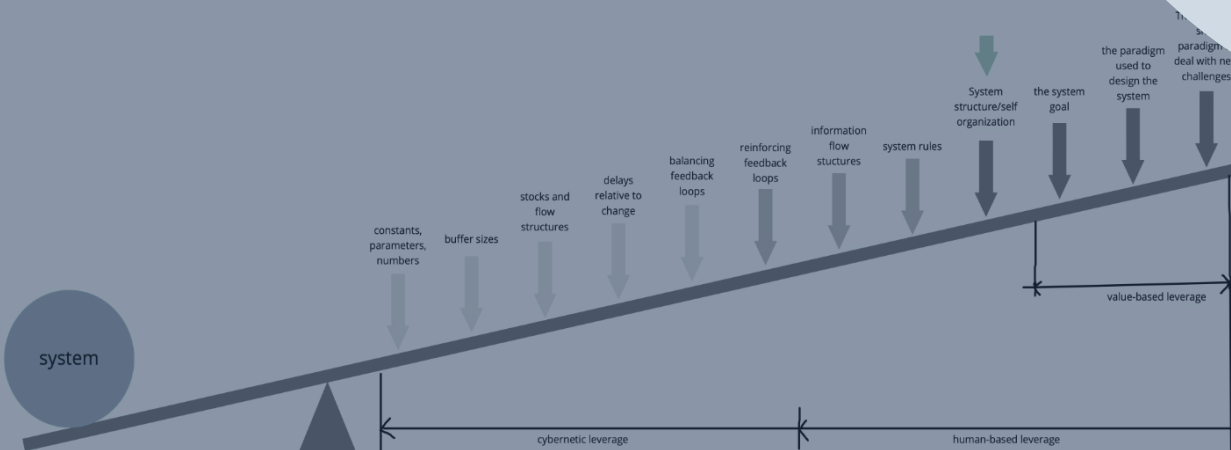

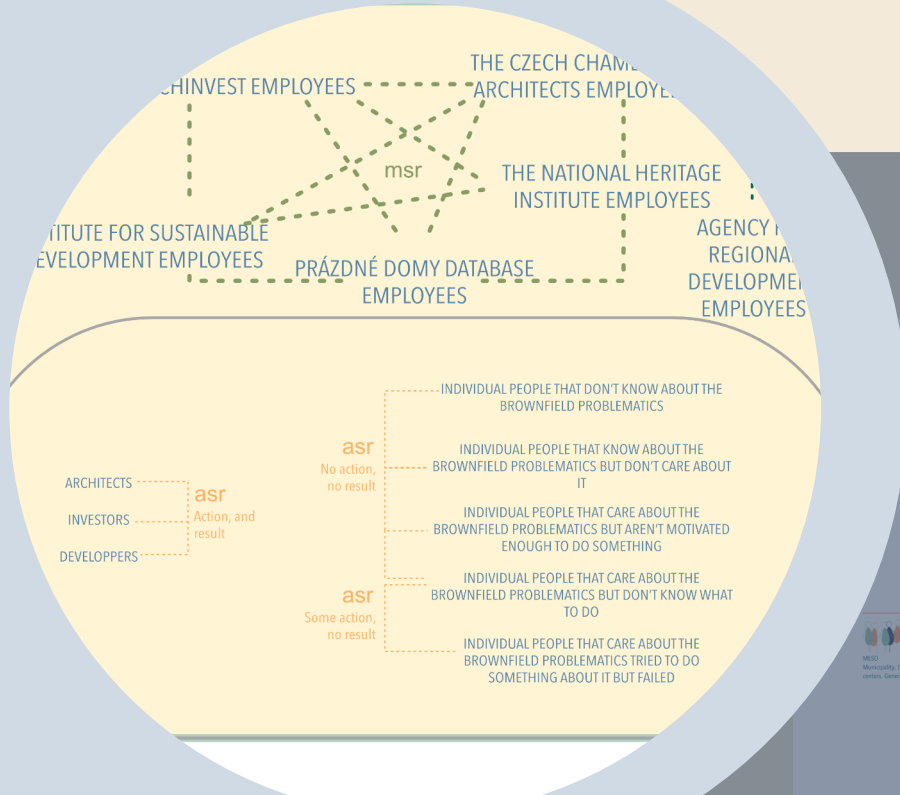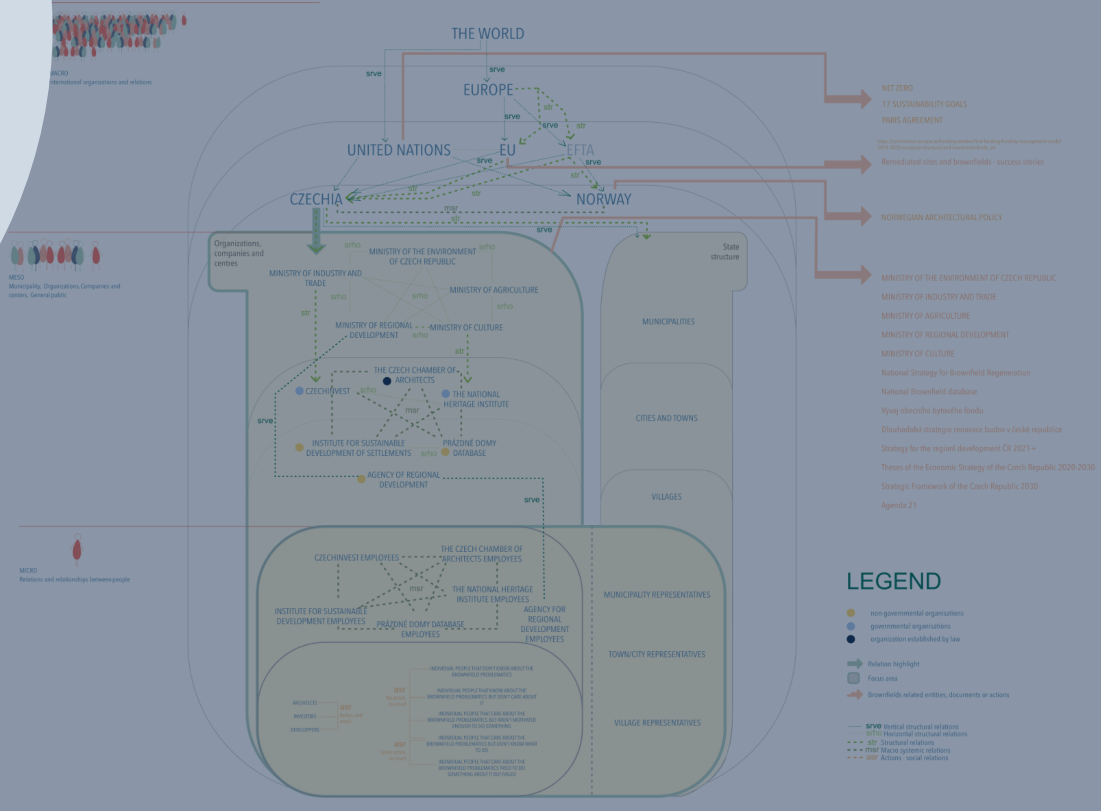Figure 18. The discussed human-based leverage of the system

Meadows, D. H., & Wright, D. (2009). Thinking in systems : a primer.

Figure 19. Actions - social relations

THE CZECH CHAMBER OF ARCHITECTS EMPLOYEES
CZECHINVEST EMPLOYEES
msr
THE NATIONAL HERITAGE INSTITUTE EMPLOYEES
AGENCY FOR REGIONAL DEVELOPMENT EMPLOYEES
INSTITUTE FOR SUSTAINABLE DEVELOPMENT EMPLOYEES
PRÁZDNÉ DOMY DATABASE EMPLOYEES

INDIVIDUAL PEOPLE THAT DON'T KNOW ABOUT THE BROWNFIELD PROBLEMATICS

asr
No action, no result

INDIVIDUAL PEOPLE THAT KNOW ABOUT THE BROWNFIELD PROBLEMATICS BUT DON'T CARE ABOUT IT

INDIVIDUAL PEOPLE THAT CARE ABOUT THE BROWNFIELD PROBLEMATICS BUT AREN'T MOTIVATED ENOUGH TO DO SOMETHING

INDIVIDUAL PEOPLE THAT CARE ABOUT THE BROWNFIELD PROBLEMATICS BUT DON'T KNOW WHAT TO DO

asr
Some action, no result

INDIVIDUAL PEOPLE THAT CARE ABOUT THE BROWNFIELD PROBLEMATICS TRIED TO DO SOMETHING ABOUT IT BUT FAILED

ARCHITECTS
asr
INVESTORS
asr
Action, and result
DEVELOPPERS

MACRO
International organizations and relations

MESO
Municipality, Organizations Companies and centers, General public

MICRO
Relations and relationships between people

THE WORLD
EUROPE
UNITED NATIONS
EU
EFTA
CZECHIA
NORWAY

NET ZERO
EF SUSTAINABILITY GOALS
PARIS AGREEMENT
NORWEGIAN ARCHITECTURAL POLICY
MINISTRY OF THE ENVIRONMENT OF CZECH REPUBLIC
MINISTRY OF INDUSTRY AND TRADE
MINISTRY OF AGRICULTURE
MINISTRY OF REGIONAL DEVELOPMENT
MINISTRY OF CULTURE
National Strategy for Brownfields Regeneration
National Brownfield database
Agenda 21

Organizations, companies and centres

MINISTRY OF THE ENVIRONMENT OF CZECH REPUBLIC
MINISTRY OF INDUSTRY AND TRADE
MINISTRY OF AGRICULTURE
MINISTRY OF REGIONAL DEVELOPMENT
MINISTRY OF CULTURE
THE CZECH CHAMBER OF ARCHITECTS
CZECHINVEST
THE NATIONAL HERITAGE INSTITUTE
INSTITUTE FOR SUSTAINABLE DEVELOPMENT OF SETTLEMENTS
PRÁZDNÉ DOMY DATABASE
AGENCY OF REGIONAL DEVELOPMENT

State structure
MUNICIPALITIES
CITIES AND TOWNS
VILLAGES

CZECHINVEST EMPLOYEES
THE CZECH CHAMBER OF ARCHITECTS EMPLOYEES
THE NATIONAL HERITAGE INSTITUTE EMPLOYEES
INSTITUTE FOR SUSTAINABLE DEVELOPMENT EMPLOYEES
PRÁZDNÉ DOMY DATABASE EMPLOYEES
AGENCY FOR REGIONAL DEVELOPMENT EMPLOYEES

MUNICIPALITY REPRESENTATIVES
TOWN/CITY REPRESENTATIVES
VILLAGE REPRESENTATIVES

LEGEND
non governmental organizations
governmental organizations
organization established by law
Relation highlight
Focus area
Brownfields related entities, documents or actions
srve Vertical structural relations
srho Horizontal structural relations
str Structural relations
msr Macro systemic relations
asr Actions - social relations

3.1.1.1 Areas of focus/pain points - the importance of user involvement in Human Centered Design product development

Throughout the research there was a stage of desperation as it seemed that the system that is set to deal with brownfield is so rigid, that there really is nothing for me to do as an individual falling under the general public category. And since the motivation for even looking into this problematics was fueled with hope that I can actually find something, I was losing hope and imagining that the final conclusion of this thesis will inevitably be something of a sort, that as a designer one can't really do much if not having a huge amount of money. That is where the importance of user involvement showed the most; it helped me as a designer to shift the focus from the general system that only added to the on growing misery of being stuck, to the individual needs of people representing identified groups that immediately provoke the ideation processes. By focusing on the users, I restored the chances for the thesis to actually add some greater value to this society.

The first involvement of the users was through the quantitative research method, the semi-structured interviews *(Fig. 20)*, which was chosen in order to assist in formulating the general problems (Muratovski, 2016c).
Questioned were representatives from most of the groups defined in the Stakeholders chapter of this thesis. The reason for excluding region/municipality representatives was as during the research phase I attended a public seminar called Brownfields a greenfields v Libereckém kraji where there was a speaker representing the activities of the Liberec region in the matter of brownfields, so insights were gathered already there.

The people participating in the interviews were:
Tomáš Kysela - an Investor
Radovan Baloun - Director of Business Localization in the CzechInvest
Štěpánka Kašparová - Owner of a brownfield and, as it turned out

more of a general public representative
Jiří Kubeš – real estate agent focusing on large real estates

The interviews were conducted in accordance with the SIKT approval (Appendix p.4-21), recorded in an audio recording and afterwards transcribed into the Card Sorting method (Hanington & Martin, 2018) . After that the recordings were deleted as they were no longer needed. The cards created out of the interviews were color coded to visually divide the pain points that the interviewees felt in connection to the brownfield problematics *(Fig. 20a)* and then divided into a heat map *(Fig. 20b)* which highlighted the most discussed problematic areas, as well as the delights system stakeholders experience in regarding brownfields . The heat map was perceived as extremely useful as the most problematic areas really did accentuate the problematic locations which assisted in drawing evidence-based conclusions with complete focus on the user which contributed to the holistic measure of this master thesis *(Fig. 20c)* (Appendix p.22,23).

The biggest pain in the system, based on the opinion of all the interviewees, showed to be the lack of clear source of information regarding brownfields and the revitalization processes in combination with crucial contact information on experts in fields connected to the brownfield problematics. This finding supported the anticipation that was concluded after the literature review research and the attendance of the seminar that a product designer's greatest contribution to the society regarding brownfield problematics would be through the application of User Experience approaches (UX) (Coursera, no) focusing on creating a website that would unify all the necessary data.

To empathize better with the highlighted need of the user groups, based on the findings and with accordance to the service design approaches, there were defined personas ("Personas," no) to assist in keeping the needs of the designated users in mind when designing for the product.
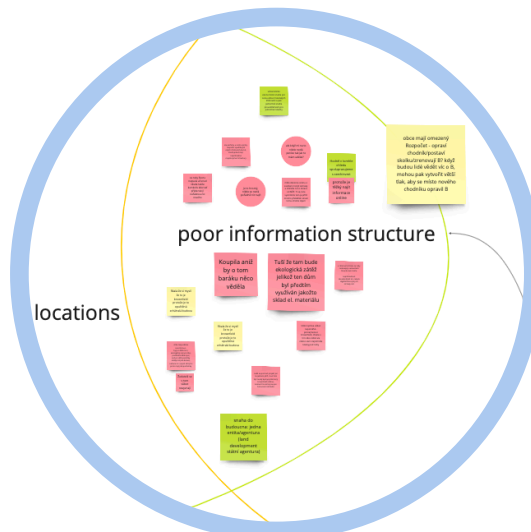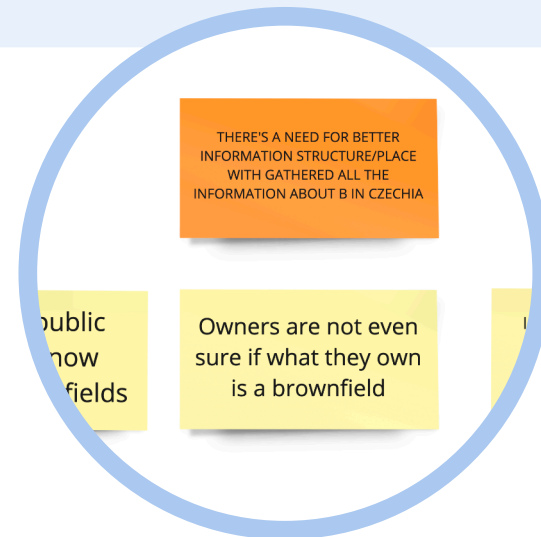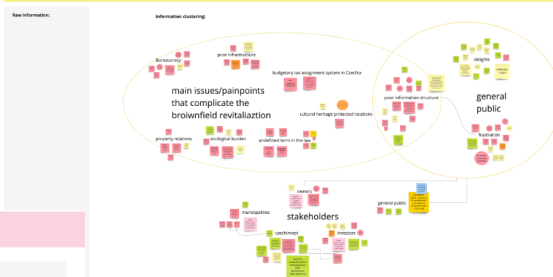
THERE'S A NEED FOR BETTER INFORMATION STRUCTURE/PLACE WITH GATHERED ALL THE INFORMATION ABOUT B IN CZECHIA

Owners are not even sure if what they own is a brownfield

Figure 20c

Figure 20b

poor information structure

locations

Figure 20a

funding - koupit si cihlu

hypotéky

ajímáte se o ůzkum veřejného mínění?

Ano - ale neděláme primárně centrum komunitního

musí být ziskovost projektu

Když se rozhodujete že budete investovat do brownfieldu, tak co děláte?

Všechno si zjišťuje sám

dotace jsou jen pro kraje, města a obce

jediné dotace co se dají čerpat jsou na energie zateplení atd

říct jaká je á cena za ld?

Ne

Cena se pohybuje podle velikosti, lokace a stavu

lokace je důležitá - neprospertativní místo - za pár korun, u Prahy nebo na ostravsku 100ky milionů korun

Conclusions

Insights clustering

General public doesn't know about brownfields

Interviews Analysis

Insights Extraction

Raw information:

Information clustering:

main issues/painpoints that complicate the broiwnfield revitaliaztion

general public

stakeholders

Figure 20 a,b,c. The Card Sorting method - 4 semi-structured interviews, Appendix p. 22,

29

To empathize better with the highlighted need of the user groups, based on the findings and with accordance to the service design approaches, there were defined personas ("Personas," no) to assist in keeping the needs of the designated users in mind when designing for the product *(Fig. 21-23)*.

The shift in the intention for product development appeared after the interview with Radovan Baloun, who told me that CzechInvest received funds from the state around a year ago for creating exactly such website, and that approximately after one week after our interview, which took place the 27th of March 2023, the website is to be launched. Which leads us to the already few times mentioned new website, that was eventually launched slightly later then the anticipated one week ("MPO a CzechInvest spustily nový web o brownfieldech v České republice," 2023). On one hand this could've been perceived as a complication of the master thesis, however in a personal opinion, this situation only contributed to showcasing designers abilities as this is something that can, and probably often does, happen in the every-day life of designers. So dealing with this situation and adjusting to the change of the context represents and enhances my abilities as a product designer.

To tackle the newly appeared information and continue in the design process the focus was shifted to another conclusion, derived from the interviews represented in the heat map *(Fig. 20b)* and supported by the poor information structure, that has perceived as the second most impactful to the brownfield situation in Czechia; the lack of knowledge about brownfields throughout the general public.

To enhance the importance of directing the designer's focus of product development to the mentioned issue, I would like to describe a situation that is according to the words of Radovan Baloun, quite often repeating scenario; State and EU funds are crucial in financing brownfield revitalization efforts. However, the allocation of these funds can be unpredictable, leaving

municipalities with a difficult decision to make. Despite investing significant resources in preparing project documentation, they may discover that the available funds do not align with their intended project, which can result in forcing the municipality to change its plans instead of just waiting for the proper funds to come, potentially wasting millions of CZK. The choice of going for the change instead of waiting is caused by the democratic structure and powered by the fear of being overruled by an opposing party in the next elections, by proclaiming that the current party wasted millions that could've been used elsewhere. While going for the diversion from the initial plans may seem like a reasonable compromise, it creates a long-term problem. The decision to change course could result in a brownfield that is not fully utilized, leading to its eventual deterioration and the need for another future revitalization efforts. It's essential to consider the long-term perspective when making decisions about brownfield revitalization to ensure that we are making the most effective use of resources and achieving the desired outcome (Baloun, 2023).

Empowering the general public with knowledge on brownfield revitalization can be a game-changer in elections (Baloun, 2023). By being informed about the complexities involved in brownfield renovations, voters are more likely to be understanding of the actions taken by political parties. This shift in perspective gives a significant advantage to those who prioritize brownfield revitalization over those who neglect it. With this approach, municipalities will be represented by officials who take action towards addressing brownfield issues, thus paving the way for a more sustainable and prosperous future (Baloun, 2023).

To better empathize with the users there were, based on the personas, created a BIO cards highlighting the needs of the defined stakeholder persona representatives *(Fig.21-23)*.

Maria is a 50 year old wife and a mother to one adult son. She works part time as an insurance agent, while also being self employed. Few years back she bought an building that neighbours with her house, as it was triggering to see it abandoned for so many years. Her dream is to regenerate it into a centre for youth and for children with disabilities. In order to be able to renovate it, Maria needs to learn what are the steps that one must take. She believes in community and helping others and with her dream, she wants to add value to the part of the Liberec region she lives in.

50 years old

Bachelors degree in social sciences

Lives in Liberec region in a small town

Husband and one adult son

Part time insurance agent , part time self employed

MARIA

GOALS

Find all the necessary information on brownfield revitalisation

Get money for the regeneration of the house, and make it into community centre.

FRUSTRATIONS

"I wrote to literally everyone. I contacted the Church, all the relevant ministries,I visited the Trip that is organised by ARR, I went to the Brownfield seminars, contacted the Liberec representatives... Really, I talked to everyone and noone wants to help."

"Believe me, finding any relevant info online is a pain in the as-. The only nice looking and sort of easy to navigate website is from Ministry of the Environment of the Czech Republic"

"I can't reach out to EU funds and organisations, because I don't speak any english"

"I wish someone would make one website in czech language for me to find all the necessary info on brownfield revitalisation"

Peter is a 80 years old father of two adult children. He is in retirement but used to be a teacher. He spends most of the days inside or walking his dog in the forest. He owns 1/3 of a house with his siblings and they fought so hard over it that now they have a property law dispute over it. They are having court proceedings for the past 5 years and there's no light at the end of the tunel just yet, so the house is starting to fall appart as noone wants to take care of it since they don't know if they'll win or not. But there are no information to be found in the internet on what to do in such situation that he's feeling very hopeless.

80 years old

Retired but used to be a teacher

Liberec region

Two children, one dog

PETER

GOALS

With the lawsuit so he can have something to pass onto his children. They can then start taking care of the house.

Find source of information on how to proceed in his situation.

FRUSTRATIONS

The lawsuit is going for so long that he's afraid that he won't have money to proceed, or that he'll die before it ends.

Disappointed with the town management as noone is able to give him any info on what to do.

"I wish someone would just tell me what to do! Or at leas tell me where to learn what should i do. Oh and I wish to win the lawsuit!"

Jørgen is a 42 years old father of two teenage children. He is an real estate investor. He doesn't trust anyone, so regarding a background check for the real estate he's interested in, he is doing almost everything by himself. He consideres himself as a hard extremely motivated and working person, and thinks that people who complain about their life are just lazy. Lately his interest is in brownfields investments, but he only invests into those, where one can be almost 100% sure that there's no ecological burden. He is currently considering an investment into a place within city centre and perceive it as real estate philantrophy.

42 years old

High school and University of economics

Jablonec nad Nisou

Two children

Real estate investor

JØRGEN

GOALS

Make loads of money.

Find a hidden gems- brownfield that has nil ecological burden, then sell and invest this without property complication. It is not a Cultural heritage, is in a prosperous location and one can build a business such as it to attract future visitors and current newcomers.

FRUSTRATIONS

"The bureaucracy is insane. At every critical point when you need to get an approval, you have to wait for 30 days for their response. And when they decline your request due to some errors so this can repeat like a times before you get the approval, build it, sell it wrong, impossible, and then goes into so brownfields do how can i not make mistake? Also Sort of disappointed in the state and municipality that there are no funds investors are entitled to."

"I wish the process of getting approvals was so much faster and smoother! It costs me potential buyers and a loads of money!"

Figure 21. - 23. Defined personas relevant to the system; Appendix p.28

education out of 72 participants 24 did not even know what a brownfield is, based on which it is intuitively assumed that the awareness of the whole society is probably even lower. Out of the 48 voters that knew what a Brownfield is, no one exactly correctly answered what it then actually really is. They often knew that brownfields are connected to abandoned buildings that lost their original purpose, and often mentioned was industrial past use. Only 5 of them managed to also note that brownfields often carry some hidden ecological burden that calls for sanitation of the land.

Afterwards the same group of people was asked how often they "meet" a brownfield. Only two people voted that they are sure they do not meet any brownfield on daily or weekly basis as there are none around the area they often appear in. And the rest usually voted for an option at least once a week. This points to the magnitude of the brownfield issue and that it can be, based on these findings, assumed that it touches upon the lives of most people in Czechia.

Circa 90% of the 48 respondents also replied that they do notice it when they're passing a brownfield, yet around 40% of those also said they don't care about them.
Participants that answered that they do care about brownfields but never actually did anything about it, were afterwards questioned through private messages. The reason behind doing so was to understand the behavioral patterns behind their lack of action. Answer often repeated by many was that brownfields, although ugly and bothersome, aren't a personal issue big enough that would really motivate them to act more, than "just" signing a petition.

The names of the respondents were blackened or erased from the figures in order to protect their identities. Findings from the survey did in fact supported the statements of the interviewees thus 'spreading awareness about brownfields throughout general public was selected as the goal for product development'.

In order to ensure the correctness of the conclusion that the general public lacks knowledge about brownfields, there was conducted an online survey based on social media (Appendix p.24). This quantitative empirical research method was chosen as it is a more suitable approach to obtaining the objective measurement of reality and lets the researcher be independent (Muratovski, 2016a).

 The answers gathered from the survey were mostly submitted by respondents falling into an age group of 14 - 35 years old. This means that results from the survey can't be perceived as definite truth as the sample does not represent the whole society despite the fact of them residing in different towns and cities over the Czech Republic. However the findings did support the initial conclusion as the respondents were mainly highly educated people where most of them had a university title, and despite their

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4 RASING AWARENESS ABOUT BROWNFIELDS IN CZECHIA
A gamified service

The proposed design is a digital service containing an experience built upon Mapy.cz, a Czech version of Google Maps. Through the initial research, the objective of the product was determined to be the dissemination of knowledge about brownfields to the public, with the aim of spurring users into action that will contribute to improving the current brownfield situation in Czechia. Although the intention for the service is to be utilized in all of the regions of the Czech Republic, the designed functioning of the promoted service is depicted on a narrowed focus towards the town of Liberec *(Fig. 24).*

Used was the scarcity principle (Cialdini, 2011), which creates a desire to possess something that is not readily available, to motivate users to participate in the experience and compete for a prize. As a result, the service takes the form of a set of competitive games where users collect points that determine their ranking *(Fig. 25)* (Appendix p.27). This competitive element, as suggested by Cialdini's social proof principle (Cialdini, 2011), is expected to increase user engagement and attachment to the game. For the scope of this master thesis, there are promoted three examples of such games in the following chapters.
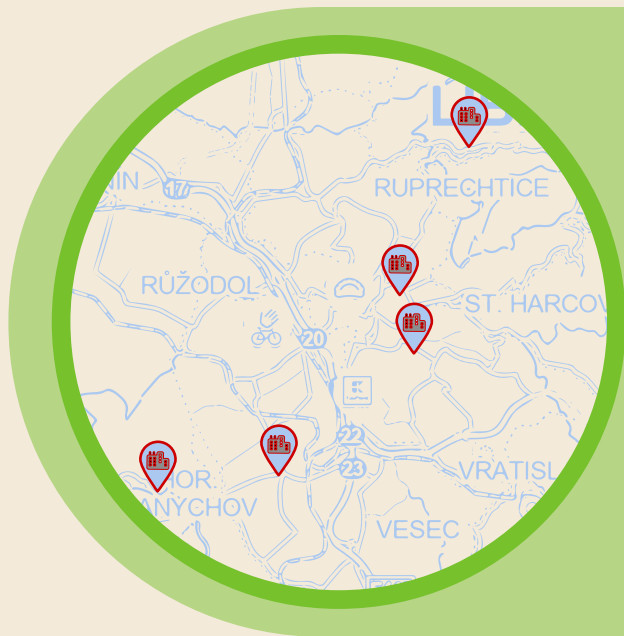
Figure 24. The area of focus for the product development
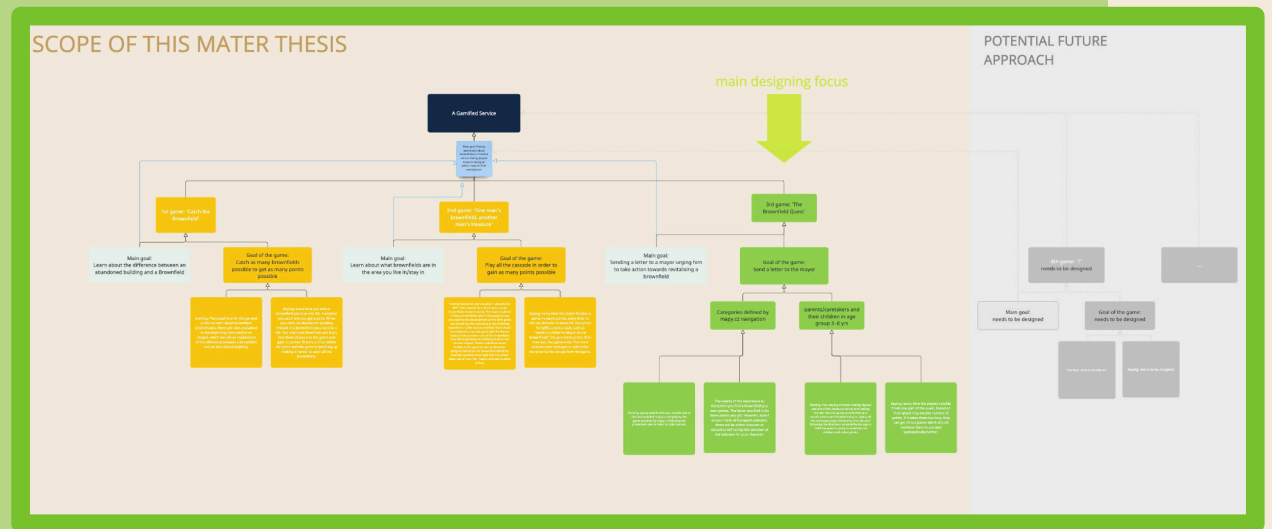
Figure 25. The form of the service - set of competitive games

4.1 The product designer's approach

The subject matter at hand may not be immediately enticing to those who lack a personal connection or interest in it. After all, it centers on something often deemed unpleasant or unsightly, which people may prefer to ignore rather than learn about (Saito, 2007). However, as we discovered in Tore Gulden's Design for Experience course during our first year of graduate studies, in order to make a lasting impression and effect change, one must engage and motivate people (Gulden & Moestue, 2011).

At the 'Brownfieldy a Greenfieldy Libereckého kraje seminar, the Liberec town representative presented their approach to spreading knowledge about brownfields. Their solution was a static exhibition of information boards that carried examples of successful brownfield renovations depicted in *figure 27* below.

Figure 27. Exhibition panels from the 'Putovní Výstava' exhibition; source: https://investujpodjestedem.cz/vystavy/

These boards were displayed in a shopping mall 'Central' located in Jablonec nad Nisou and as it was observed throughout a two-hour observation in "rush hours" when people went to the shopping mall after work, not one person stopped to read something about the

brownfields. Therefore, the attempt to inform people by such static exhibition, was evaluated as not impactful enough.

To ensure that the suggested solution does in fact achieve the outlined goal and to answer the stated research question which focus is on how can the COE approach contribute to a change in the current situation regarding brownfields in Czechia , there was applied a concept utilized through the Design for Experience subject, built upon the Context of Experience framework. The synthesis showcased its great potential through the received grade, an appreciation among fellow students and a request to present the project as an exemplary service designed in accordance with the Design for Experience approaches.

The synthesis itself *(Fig.26)*
The approach used in this project is a synthesis of various methods, primarily drawing from the 'Context of Experience (COE)' concept described in the main reference article for the subject Design for Experience by Gulden and Moestue (Gulden & Moestue, 2011). In addition to that, the final solution incorporates additive methods to enhance its impact, such as the 'Levels of Activation (LOA)' (Gulden, 2013), Cialdini's 'Persuasion Principles' (Cialdini, 2011), and the strategy for 'Consumer-Product attachment' (Mugge, 2007). Furthermore, principles from branding (Gulden, 2021a), game dynamics (Gulden, 2021b), gamification (Gulden, 2021c), plenteous play (Gulden, 2016), and approaches rooted in behavioral studies (Kahneman, 2011) were incorporated to ensure an engaging and enjoyable user experience. The application of mentioned approaches through the designing process is depicted in *Figure 28* (Appendix p.30)

In order to keep a clear track of the ideas, created was a thinking map *(Fig. 29)* in an online collaborative thinking tool Miro (Appendix p32).

Figure 26. The synthesized framework for Design for Experience

Figure 28. The application of Design for Experience approaches though out the stages of COE method

Figure 29. The thinking map

4.2 Behavior of the users

4.2.1 Habits

Based on user involvement, it was discovered, that the main reason for the general public's lack of engagement with the issue is their tendency to ignore it as it does not directly affect them. This lack of personal connection makes it difficult for them to be motivated to research ways to contribute positively and take action. To overcome this, it is important to first break the cycle of this undesirable habit and establish a new one. The BCD method (Gulden & Berg, 2011) was used to amp up the ideation process by the application of a more creative yet effective way of thinking. Answers to the questions were based on the findings from the empathize phase (Coursera, no) in combination with intuition.

1.) Breakdown of functions
- Why don't some people know what a brownfield is?

They have never heard of it before
- Why don't some people care about brownfields?

Maybe there is connection between the sensitivity of the person and the level of how much they care? Maybe they just don't have any personal attachment to the issue and if they did, they would care more?
- Why don't some people act on what they see and don't like?

Because they might be comfortable? Or they don't know what to do? Or where to start? Or they assume that it is something they can't do anything about? Or they just don't have the energy to do so.
- Why do some people accept things they dislike without a fight?

Because they might be comfortable and it's just easier to ignore than act? Or they don't know what to do? Or where to start? Or they assume that it is something they can't do anything about? Or they just don't have the energy to do so.
- What are the touch-points of general public and brownfields? When do they interfere? When do they interfere?

Anywhere outside. Can be on the daily route to work so then it becomes a stable context. Or it is outside of the stable context and then it is assumed that people are more likely to notice the brownfield and feel some emotion about it. Just an assumption though.

2.) Counter questions
- What makes people to know about brownfileds?

Through conversations mainly. Then there is a travel exhibition made by ARR, but that does not activate (levels of activation), thus there are doubts about the effects of that exhibition. Open for a research.

- ○ How to provide information in a way that people:
  - ▪ Notice the info
  - ▪ Understand it
  - ▪ Absorb it
  - ▪ Remember it
  - ▪ Act based on what they remember

Through the use of the Context of Experience method.
- What does it mean to know what a brownfield is?

To be able to describe a place that falls into the brownfield category.
- What makes people care about brownfileds?

Maybe some personal attachment? Or if people are more visually based and care about aesthetics? If people knew about it they might care more?
- What makes people act?

Good motivation
- What motivates people?

7 principles of persuasion
- Is it really that people accept it? If not, what is their way of dealing with it?

Maybe complain to their friends?
- When people do fight for what they believe in?

When they have been triggered to do so
- How do people get triggered?

When they are nudged by something they either like or dislike?
- When do people and brownfields do not interfere/meet?

When the people stay inside, or walk outside where there are no brownfields.

3.) Disassociation
- How else can the general public affect the situation around brownfields?

They can demolish it themselves, they can paint it, they can spray it with parfume, they can use it for renewable energy sources, they can plant plants around them, they can cover it up by sand or something else
- Maybe the solution isn't to care about brownfileds? What else could it be?

Can people contribute to the solution by not caring? Most likely no, cause that's how it is now. They could watch it, protect it, guard it, look after it… but I guess that all might be caring
- Do you need to know what a brownfield is in order to care?

You don't need to I guess. People can think they are taking care of something else, when in fact they'd be taking care of brownfields - shifting focus. =>
- Can people gain knowledge about brownfields without being aware about it?

Yes I believe so. Through gamification and design for experience
- Can demotivating people help changing the brownfield situation? In what way would the situation change? Would it be desirable, keeping the goal of revitalization as many brownfields as possible, in mind?

By demotivating people one can get them for example mad, which is an activation (LOA) . And that is what is necessary in order to act. Maybe it can be combined with the Idea to shift the focus to something else, while actually unconsciously contributing to the change towards less brownfields in Czechia.
- Can acceptance be an approach when dealing with brownfields?

I suppose it can be partially an approach, but only acceptance is passive which does not initiate action that is required for changing the situation. (LOA)

The BCD method contributed positively in a set of outcomes drawn out of the answers that were applied in designing for the final product:

The behavior of people regarding Brownfield problematics is defined by many aspects out of which only some are habits.

To break the habit of ignoring brownfields there can be applied activating practices, such as frustration or other LOA approaches.

Gamification and design for experience is most likely the key to breaking the habit of ignoring brownfields.

To ensure the continued success of this project, for the future approach it is recommended to utilize Fogg's behavior grid when designing strategies for establishing the habit of active participation in seeking information on brownfields. This approach offers a clear and effective way to conceptualize behavior change, helping to ensure the best possible outcome (Fogg, 2018).

Figure 30. Detail of the COE core model utilized depicted in (Fig 47.); PRE-POP Appendix p.31

4.3 Pre-purchase phase of the designed experience

The pre-purchase phase of the Context of Experience approach *(Fig. 30)* targets the moment just before the user encounters the main product of the experience. This is the moment when the user is first introduced to the service and is ideally prepared for the subsequent stages of the experience.

4.3.1 Branding

4.3.1.1 Mapy.cz

The primary goal of the branding effort was to establish an identity that resonates with the target audience, while also aligning with sustainable principles. Consequently, the decision was made to incorporate the theme of "Something Czech." This choice was driven by the understanding that true sustainability is achieved when individuals recognize the importance of local contexts and begin adapting human systems accordingly (Braungart & McDonough, 2002). The ideation behind choosing mapy.cz *(Fig. 31)* as an application of the persuasion principle of authority (Cialdini, 2011) was the crazy eights method (Coursera, no) and its outcome supporting the use of a map is depicted in the *figure 32* (Appendix p. 34). The selected idea was evaluated based on intuition and gained awareness to carry great potential as brownfields are located in the real world, thus utilizing a map for the public to learn about them is perceived as an additional measure, providing the designer the opportunity to apply the exact brownfield locations. Moreover, mapy.cz are currently being used by the CzechInvest agency to showcase the exact locations of brownfields listed in the National Brownfield Database (CzechInvest, 2007 - now). This is valuable for the developers of future iterations of the service, as they may be able to retrieve the data from the database, which would allow them to focus on enhancing the experience instead of spending valuable time and money manually creating points on the map to represent the chosen brownfield locations.

Ultimately, the use of mapy.cz as the primary platform for educating the public about brownfields was chosen due to several other reasons as well. Firstly, as a Czech product, mapy.cz was a perfect fit for the branding. Moreover, it is widely recognized for its exceptional detail and accuracy in visualizing touristic paths, making it a popular choice among the Czech population (Jeřábek, 2020). This popularity is reflected in the app's staggering daily

usage of one million people in 2020, with 40% of the users being on mobile devices (Jeřábek, 2020). Thus, the mapy.cz platform provides an excellent opportunity to reach a broad audience quickly and effectively without having to establish a new platform from scratch.
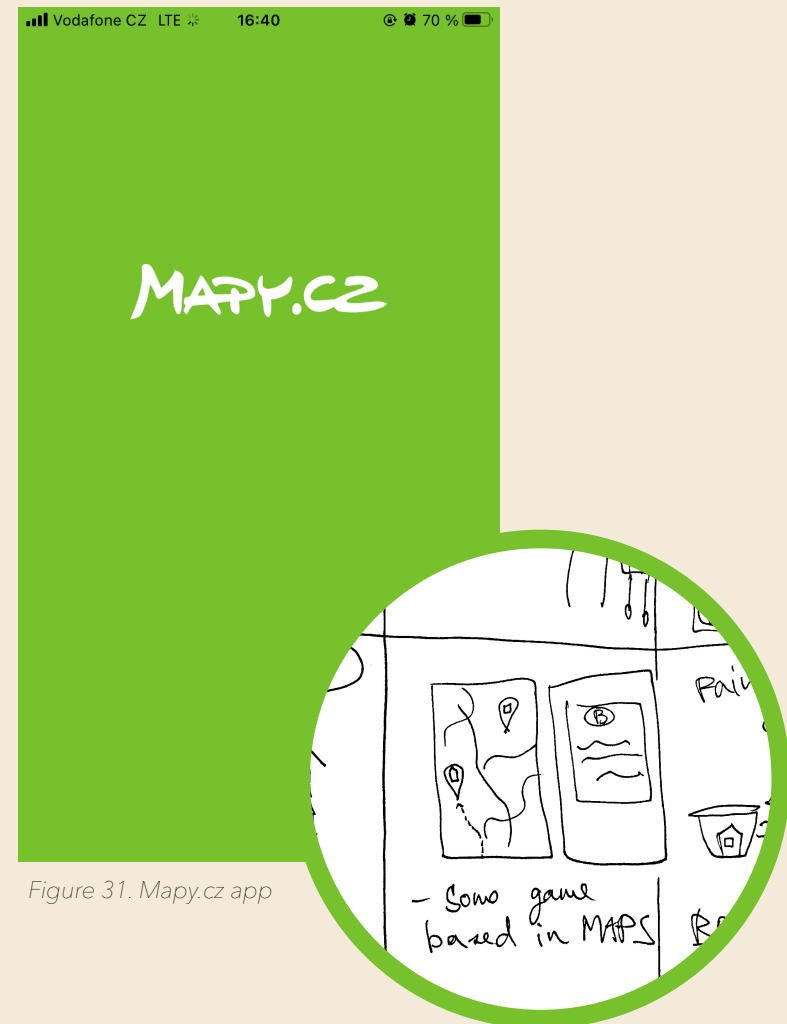
Figure 31. Mapy.cz app

Figure 32. Crazy 8 - the idea to utilize Maps

Figure 33. The initiation of branding design

4.3.1.2 Characters and the lucky talismans

The graphic developed out of the already existing Mapy.cz aspects such as color palette, logo and font *(Fig. 33)*, which was selected based on the mapy.cz logo analysis done through a font recognizing tool called 'font squirrel identifier' ("Font Squirel Identifier," no).

To the aspects were applied additive elements Czech people are recognized for, which were for example the infamous socks in sandals, the golden treasure of Czechia; our pilsner, baked goods called colache and others *(Fig.35)*. Advantage was taken also out of the already existing figure representing mapy.cz, a little dog *(Fig.35)*, as another element reminding the user of the producer of this game, the mapy.cz, strengthening the persuasion principle of authority (Cialdini, 2011). Application of these talismans is also designed for an associative reasons, hoping one creates a lasting memory based on the evoked joy throughout the suggested experience (Cialdini, 2011), so when one sees in the real life one of the things employed as talismans in this service, they would be reminded of the Brownfield problematics.

As the narrowed focus of the product development concentrated on the Liberec region, the development of the game characters was based on the tv tales that were filmed in the Liberec region, and are

popular throughout the Czech society as they belong to the classical tv tales of the country (Hoření & Mannová, 2018). The employed tales were the 'Zlatovláska', 'Prince Bajaja' and lastly 'S Čerty Nejsou Žerty' (Hoření & Mannová, 2018) which was also used in the story of the experience *(Fig.36)*.

There was employed also the personalization and self expression Consumer Product Attachment strategies (Mugge, 2007) as the user of the game has the opportunity to some extent personalize their character based on selected face parts of the figures and the choice of talismans.

Appendix p.35

Figure 34. The final branding style

Figure 35. The talismans carrying the designed branding style
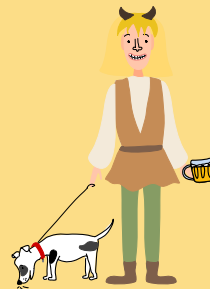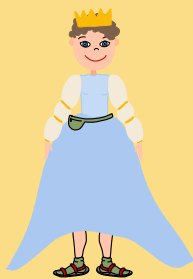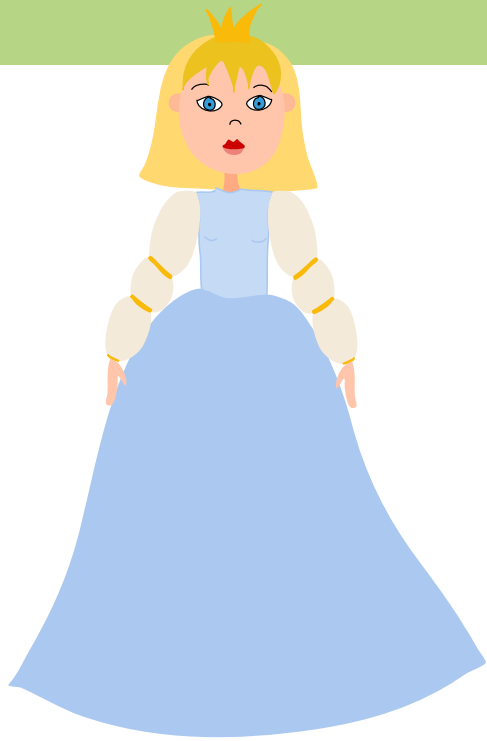
Figure 36. The characters based on the czech tales end example of their personalization Appendix p.35

4.3.1.3 Targeted users

Primarily targeted are the users of mapy.cz mobile application as the games designed often require the interaction between the users and the mapy.cz product in the outside environment. That aspect would make the usage of the desktop web application quite hard.

The final focus of this master thesis goes towards the user group of parents and their children in the age group from 3-8 years old, as children are the future of our society, thus it is crucial to educate them in brownfields and by that contribute to the development of their future sustainable behavior (Wight, Kloos, Maltbie, & Carr, 2016). Also based on personal conversation supporting the already possessed assumption arrived from observation and personal experience, parents and child-care takers of such age group are often in need for some activity to do with their children. They especially appreciate any product or service that provides such an activity, that is for free and takes the burden of ideating it away from the parent or caretaker. To empathize better with this user group, based on the findings and with accordance to the service design approaches, there was defined a persona ("Personas," no) and its BIO card *(Fig.37)* (Appendix p. 28) to assist in keeping the needs of the designated users in mind when designing for the product.
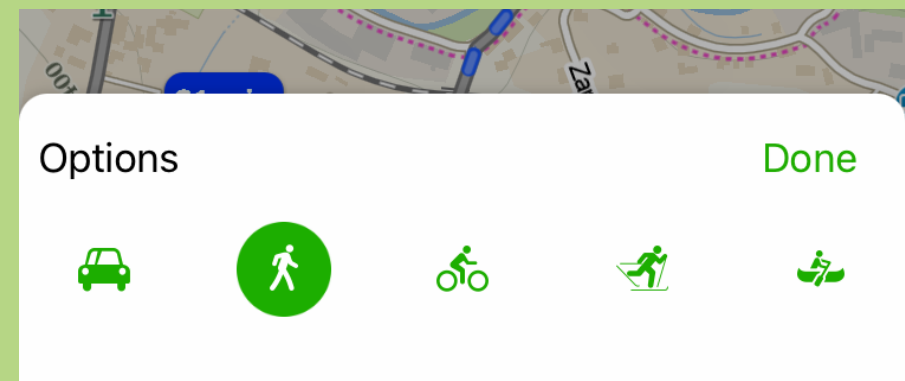
The secondary division suggested for the service development is the division already utilized by mapy.cz and can be seen in the options of navigation to selected location *(Fig.38)*

These user categories are then applied through the gamification (Gulden, 2021c) of the service as they act in combination with the selected talismans in the proposed solution as a form of strengthening the game dynamics. This approach is described in detail in the following chapter the 'general public's engagement' under chapter 'the Brownfield Quest'.

Figure 37. Persona BIO card representing the parent/caretaker user group

Figure 38. Division by the mapy.cz's navigation of users by the form of transport

Figure 39. Designed nudging sign

Figure 41. Designed nudging sign

Figure 40. Designed nudging sign

4.3.1.4 Nudging

There was also created a concept of how nudging (Laskey, 2013) signs *(Fig.39-41)* could potentially look like. In this case, there is utilized for example the frustration of the society *(Fig.41)* that is connected to rising inflation leading to the enlargement of the prices of real estate, leading to over 30% of people not being able to afford to buy one (Rybová, 2021). Or the frustration emerging from insufficient number of kindergartens in Czechia *(Fig.40)* (Jermanová, 2022). In order to secure the effectiveness of another of the nudging signs there was applied the persuasion principle of social proof (Cialdini, 2011) by saying that in the city Brno, they are capable of revitalisation yet in Liberec we are not *(Fig. 40)*, creating a need not to stay behind hopefully provoking action. Reason for selecting Brno is, because of some unknown reason, there are many jokes connected to the existence of Brno and it is often, in a joking manner, perceived as lesser of a city. Although in reality from a personal point of view it is an amazing place to be living in. Also since it is believed that frequency format has a bigger influence than probability (Kahneman, 2011), it was decided to use '3 out of 10' rather than percentage in one of the signs.

4.3.2 Priming the users

The strategy for priming involves utilizing the digital screens already installed in the trams of Liberec to display nudging signs featuring minimal information except for the branding elements and the mapy.cz logo *(Fig.44)*, which serves as a gateway to more information on the topic. The objective is to pique the curiosity of the passengers and inspire them to utilize their travel time by exploring more about the presented experience. This approach aims to create a desire in the passengers to learn more, and the subsequent online research would ideally lead them to discover the mapy.cz service and the initial game 'Catch the Brownfield' with an explanation of the overall offering. Secondarily at the times of a new game there will be a small icon carrying the logo adjusted in the branding stage with a text bubble carrying something like 'let's play!' displayed in a corner over the map. The icon would function as a call to action button (Planet, 2018) (Appendix p. 36), that would navigate the user directly to the experience.

The desktop version of mapy.cz can be utilized in the priming approach in the pre-purchase phase of Context of Experience (Gulden & Moestue, 2011). Suggested approach is based on already existing priming solution for a different type of game *(Fig.42,43)*.

Last promoted creative and engaging way to prime potential users would be through the use of guerrilla marketing tactics (insider, 2010). An example of this would be the illustrated dog designed in branding of the product attached to a window in the tram, encouraging people to "run" the dog through old and shabby buildings by looking out of the window as the tram moves in order to "revitalize" them *(Fig.45a)*. Finding a brownfield gem would earn bonus points. This interactive game would tap into the principle of social proof (Cialdini, 2011) by creating friendly competition and encouraging sharing on social media. To learn more about this experience, there would be a QR code leading to information about the experience.

Figure 42. The existing game, source:https://en.mapy.cz/zimni?x=15.6252330&y=49.8022514&z=8
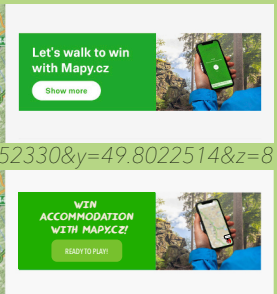
Figure 43. The proposed desktop priming

Figure 44. Nudging sign in use

Figure 45a Guerilla marketing

Figure 46. Priming example
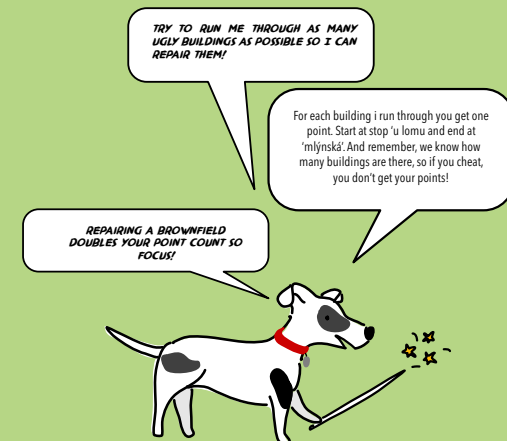
Figure 45b Guerilla marketing

4.4 The designed concept and its structure

To properly convey the dynamics of the designed conceptual service, it is necessary to divide the focus into two levels. The first level focuses on the whole experience from the first game appearing within the mapy.cz to the end which for the scope of this thesis is fulfilling the last task of the third invented game called 'The Brownfield Quest'. However, that is not expected to be the whole service as it only focuses on the stage of unfreezing the habit of not acting in regards to the brownfields problematics! The presented design thus offers a way of how to initiate a design for experience-based service, however leaves room for future continuation in order to for example establish a new habit of acting in favor of the brownfield revitalization suggested under the 'Habits' chapter.

The first level of the experience was designed with the use of the core model of the COE *(Fig.47)* (Appendix p.31).

The PRE-POP phase is already described in chapter 4.3, where the Point of Purchase is defined as the first game in the three-game series. The same it applies in the whole proposed service, the POP phase includes the first designed game 'Catch the Brownfield' and serves as an introduction to the brownfield issue, aiming to shift the player's perception from abandoned buildings to brownfields and initiate behavioral change.

The product phase of the COE encompasses all the games designed to contribute to the overall goal. Two games are suggested, with the latter one presented in greater detail to showcase the designer's abilities. The games' designs are detailed in the chapter "The Brownfield Quest." The "Product Use" phase focuses on the proposed games' functions, while taking into account that any additional games potentially created in continuation of this project in the future, needs to be designed before they can be described in this phase.
Finally, the "Post/Late Use" phase deals with situations that occur after product use, including the use of the prize.

For depicting the service suggested systemic format there was employed an individualized version of the iceberg model *(Fig.48)* (Goodman, 2002) for it assists to clearer understanding of the designed experience's layers.

Figure 47. The COE core model in use

The iceberg diagram illustrates that the individual games, which will be described in the following chapter, are the visible events in the service. The intended change in behavior is to activate a new pattern of behavior supported by the experience's structure, which is designed to be achieved by synthesizing the Context of Experience approaches. The mental models that may hinder the successful implementation of the product are described in the deepest part of the iceberg, as they are the most difficult to change (Goodman, 2002). However, despite potential user resistance based on these mental models, the proposed service is likely to succeed in its goal of spreading knowledge about brownfields among the general public, given the large user base of mapy.cz.

The systemic impact of promoted service is depicted through the visualization of the reinforcing and balancing feedback loops *(Fig.49)* (Meadows, 2008a) and through the use of the Donella Meadows ladder of leverage points *(Fig.50)* (Meadows, 2008d). According to the ladder the impact of the suggested product in combination with the large user base of mapy.cz should be quite remarkable as it is located in the value-based leverage area of the ladder which is according to the visualization the most impactful one.
Allocating the service to the goal leverage point is due to the fact that the goal of the service is to spread knowledge about brownfields and make people to act towards the brownfield revitalization which is in coherence with the outlined need of the current situation.

Figure 48. The Iceberg Diagram; The service, Appendix p.61
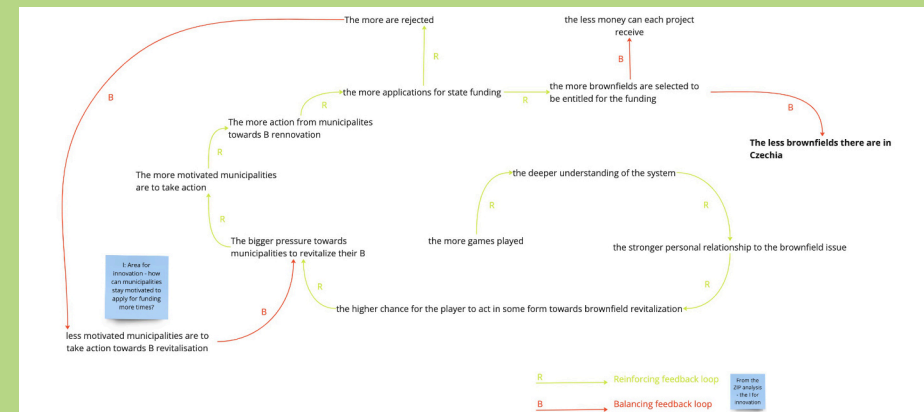
Figure 49. The balancing and reinforcing feedback loops of the promoted service, Appendix p.60
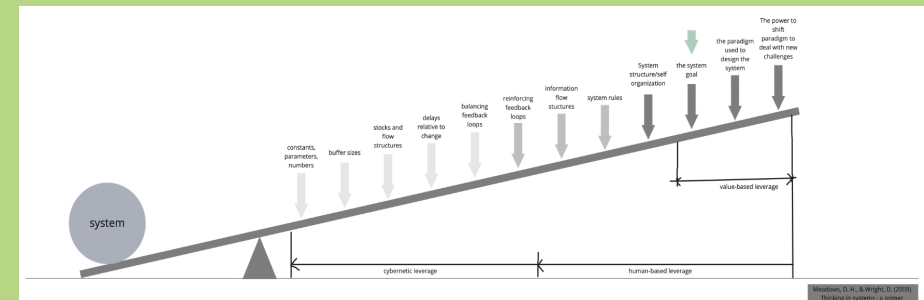
Figure 50. The main leverage point of the proposed service

4.4.1 Framing and Keying of the proposed gamified service

As it was already implied, the proposed framing for the experience (Gulden, 2021b) involves utilizing mapy.cz to play a series of games that appear on irregular basis on the maps. Players must complete various tasks and adhere to specific rules for each game to accumulate points required to win a prize.

In the proposed design, the keying of the experience (Gulden, 2021b)is also carefully designed to ensure maximum engagement; Every time a game is successfully completed, points are earned, incentivizing users to continue playing. However, missing the deadline to play a game results in no points earned for completion. Each game has its unique framing and keying, specifically tailored to the objectives of that game. The design of this thesis concludes with users sending an email to the Mayor, with the completion of this crucial step being necessary to earn the required points to win the game as that is the goal for the user. As users progress through the various games, they gain a deeper understanding of brownfield issues and potential solutions. While the proposed service currently consists of only three games, it is recommended to develop more games to further enhance the experience. Only after completing all the games will the points be tallied, and prize winners will be selected based on their total points earned.

The prizes designed for motivation of the users to participate in the game were suggested to be experiences connected to the region in which the player is located. Since the main focus went towards the Liberec region, the proposed first prize one can win could be an accommodation in a revitalized brownfield such as 'Dvůr Hlaváč'*(Fig 51)*. Following suggested prizes are for example entry tickets to museums and entertainment centers, that were also formerly a brownfield. Examples of such can be the center 'IQ Landia'*(Fig 52)* nearby the Liberec railway station or městské Museum *(Fig 53)* of

town Frýdlant in the Liberec Region. These prizes are not only seen as a motivation, but they also contribute to the goal of the experience to educate users as they have the opportunity to learn about buildings that were once brownfield and experience for themselves how can a brownfield be turned into something new and alive. It is expected that such experience can create a personal attachment of the user to the brownfield problematics and higher the chances of the user to be proactive towards the brownfield revitalisation.

Figure 51. Dvůr Hlaváč

Figure 52. IQ Landia

Figure 53. Městké Muzeum

Images retrieved from: https://investujpodjestedem.cz/vystavy/panely/ ?rl_gallery_no=1&rl_page=3

4.4.2 The 1st game; 'Catch the Brownfield'

Figures 54-66, Appendix p.33

As previously mentioned, the game serves as a priming experience for which the touch points could either be in a tram as there's a plenty of time that people usually spent on their phones while traveling anyways, or the navigation to it would go directly through the mapy.cz mobile application.

To maintain continuity, the game uses the same branding and graphics as the rest of the experience and Its gamification (Gulden, 2021c) is intended to create an immersive environment that enhances the engagement (Jenkins, 2010) thus supports the learning process. The rules of the game that define the difference between a brownfield and an abandoned building are in accordance with the National Strategic Document for Brownfield Revitalization thus apply in real life as well. The anticipation is that the player would learn the brownfield defining aspects through the game and then extract (Jenkins, 2010) this knowledge and based on recognition principle (Cialdini, 2011) which would lead to knowing which of the assessed buildings in the real life are in fact brownfields. Of course, in reality the brownfield distinguishing sadly isn't so simple and probably very often it would be impossible with this simplified knowledge to correctly identify a brownfield.

Also in this case the non-negligible part presents the psychological phenomenon as one building based on mere observation can seem structurally compromised or contaminated yet to someone else it can seem perfectly okay. Nonetheless the proposed experience focuses on creating an awareness among the public and does not require users to correctly recognize a brownfield every time they see one, thus it is not considered an obstacle. It should be however kept in mind when designing for the following games.

Partial preview of the game introduction - shift in the understanding

Figure 54.-61. The shift in the brownfield understanding - the game introduction

Preview of the 1st game interface   Appendix
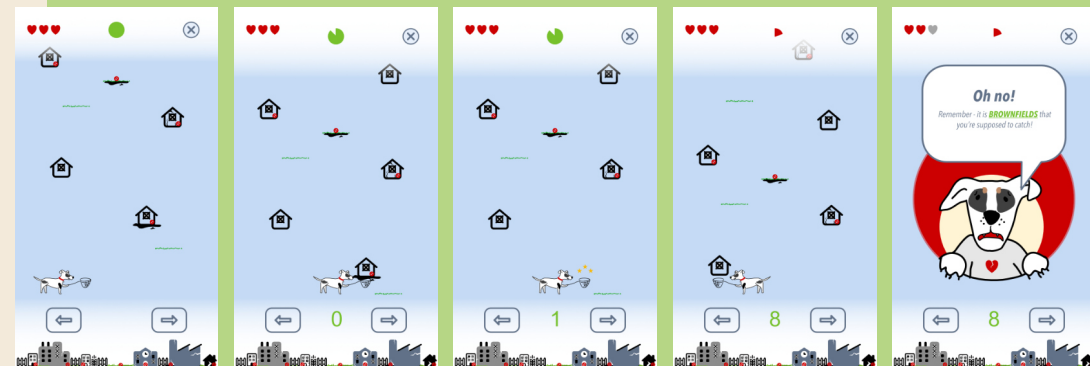
Figure 62.-66. The 1st game itself - the interface

Framing (Gulden, 2021b) for the 'Catch the Brownfield' game; The baseline is for the general public to learn about brownfield problematics, there are rules explained in the beginning that need to be obeyed, which include an explanation of the difference between a brownfield and an abandoned building.

Keying (Gulden, 2021b) for the 'Catch the Brownfield' game; every time you miss a brownfield you lose one life, every time you catch one you get a point. When you catch an abandoned building instead of a brownfield you also lose a life. You only have three lives and if you lose them all you lose the game and gain no points. There's a timer within the game and the game is speeding up making it harder to catch all the brownfield

4.4.3 The 2nd game; 'One man's brownfield, another man's treasure'
Figure 67, Appendix p.33

As it was mentioned, the focus of the designer went for defined reasons to the other two proposed games of the service. However, for informative purposes there is a brief explanation of how the second game of the promoted service can look like.

The main goal of this game is for the user to learn about how the brownfields nearby to him actually look like. Secondary goal is to collect points in order to have higher chances to win the whole experience, thus be more likely to participate in following games which all in total serve the purpose of the experience. That is the education of the general public on brownfields topic and making them act thus contribute towards the brownfield revitalization.

Figure 67. The 2nd game itself - the interface

The proposed **framing** (Gulden, 2021b) of this game is that based on one's location defined by allowing for GPS, there would be a list of some actual brownfields located nearby. The exact locations of these brownfields aren't disclosed as they are used for the development of the third game and telling the player about them would spoil the following experience. Under each brownfield there would be designed a cascade game with the theme based on the previous use of the brownfields thus the importance of outlining them in the second chapter. Example would be a cascade game in an old industrial factory or in a building that initially served housing purposes. There could be bonuses hidden in the game as well as obstacles designed based on the brownfield definition. Example could be an oil spill that if touched, takes one of your life. There's a limited number of lives.

The **keying** (Gulden, 2021b) is designed so that every time the player finishes a game he earns points, every time he hits an obstacle he loses life. Every time he fulfills a bonus task, such as "sending a letter to Mayor about brownfields", he gets extra points. If all lives lost, the game ends. The more bonuses one manages to collect the more points he can get from the game.

4.4.4 The 3rd game; 'The Brownfield quest'

Figure 68-88, Appendix p. 38-58
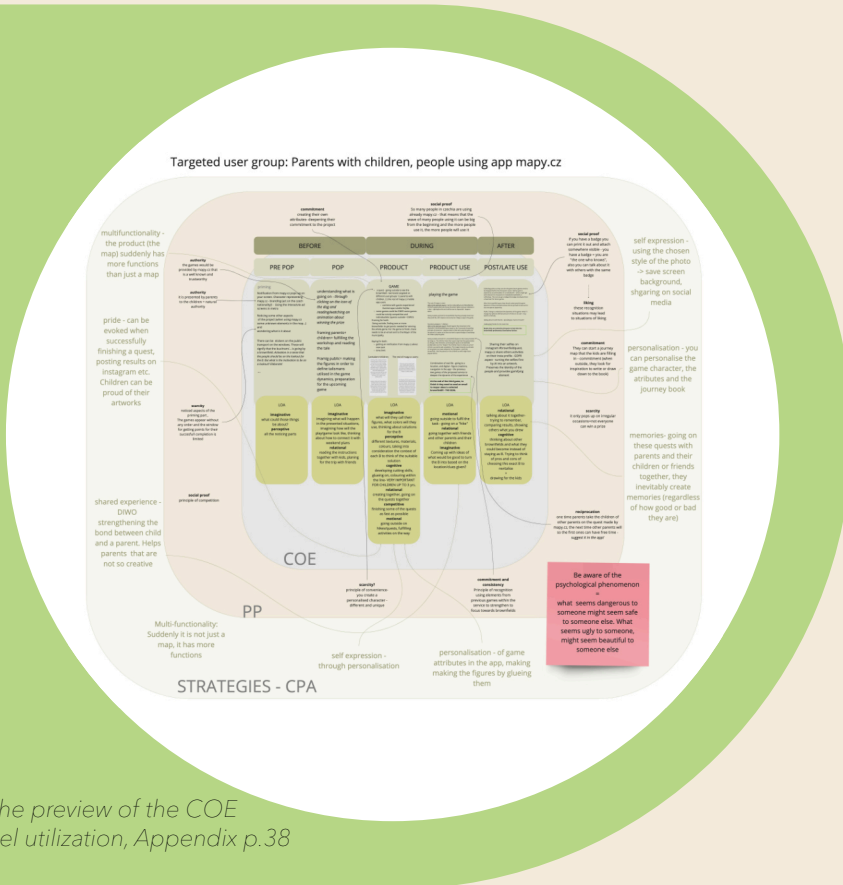
Figure 68. The preview of the COE synthesized model utilization, Appendix p.38

4.4.4.1 The caretakers and the children - the main area of focus

As it was mentioned in 'The product designer's approach' chapter, the main utilized method for the main product of the experience was the synthesized model of approaches from the Design for Experience subject *(Fig. 68)*. To infuse some Transmedia storytelling principles (Jenkins, 2010), two primary forms of media were created

to narrate the story - the first being a written tale based on one of the chosen tales for branding development - the tale 'Zlatovláska' and the second being a game guiding the parents on the mapy.cz app during the quest, fitting the spreadability principle. In addition, the seriality principle was incorporated by introducing slight differentiations to the storylines of the tale and game, creating room for more associations with the topic of brownfields.

4.4.4.1.1 PRE-POP

The goal of the PRE-POP phase was to prepare both children and their parents or caretakers for the upcoming experience. The approach suggested care takers prime children and themselves by playing the "Catch the Brownfield" game *(Fig.54-66)*. If for some reason they missed this game and don't want to play it without receiving points, there is another way of priming implemented. This involves printing out provided PDF documents *(Fig.70-78)* from mapy.cz and learning about their use. They would then discover that there will be a quest in the upcoming days, where a hero is needed to save Liberec from an enchanted brownfield. To create the hero, one of the documents has figure parts that can be selected, cut out and glued to the presented chosen body. Another task is to select two of the presented lucky talismans as the hero won't be able to finish the quest without them. This exercise allows space for children's imagination through a discussion about what can the enchanted brownfield be which contributes to overall enjoyment (Gulden, 2013). The creation of the figures allows for free self-expression and the development of a personalized experience, which can be considered as a form of Plenteous play(Gulden, 2016). However, to keep the focus on the brownfields, that is supported by the branding, the figures are in a way framed to match the styles of characters created by the users from groups defined by mapy.cz.

Furthermore, this step plays a vital role in cognitive activation, as it involves activities such as cutting out paper, gluing, and coloring within the lines. These activities aid in the cognitive development of preschool-aged children (Dadvand et al., 2015).

It is also an activity presented by parents or caretakers who are natural authorities to the children, consistent with the authority persuasion principle. This phase is assigned relational levels of activation for discussion and imaginative for the creation (Gulden, 2013)

4.4.4.1.2 POP

The next step involves the point of purchase phase, which takes place in the evening of the first day. During this phase, the children will be introduced to the story of the enchanted brownfield *(Fig.70-78)*, and with the help of their parents, they will try to understand the tale. The story is solely written, and the caretaker reads it to the children, encouraging their imagination to activate (Gulden, 2013) as they visualize the situations described by the words. Throughout the tale the child is introduced to the term brownfield and its meaning. Although, as the product is aimed towards small children, the definition of the brownfields is simplified to a 'scary looking building' which should be easier for children to comprehend. Of course, the downside of this solution is that such a definition can in fact also just describe an abandoned building. That was however evaluated to be of insignificance for the purpose of this game, as the children do not usually know even what category does brownfield belong to.

Thus, the correct understanding of the brownfields definition directed on children can be implemented in the future continuation of this experience. Also, to deepen the child's engagement and support ideation, the reader incorporates the chosen character name into the story by filling in the blanks.

4.4.4.1.3 PRODUCT

The product phase commences with a workshop for the children on the quest day morning, where they once again engage in DIY and DIWO activities (Gulden, 2016) to create their own attributes, such as crowns or horns *(Fig.70-78)*, representing their designed characters - the heroes from the tale. This step not only enhances their creativity but also again boosts cognitive activation (Dadvand et al., 2015).

Following the workshop, the main experience, the quest itself, unfolds, which necessitates users to venture outside and complete tasks delivered through mapy.cz. Based on the initially described persona there was created a journey map of the persona for suggested the product use depicted in the *figure 69*.

4.4.4.1.4 PRODUCT USE

Equipped with their created attributes, one of the crowns or horns, one of the chosen talismans, the quest map, and the necessary tools outlined in the printed PDF document, participants engage in an immersive role-playing experience. They become the heroes of the story, tasked with saving the city. Guided by the app, players navigate to various destinations where they must complete tasks to unlock the next steps of the quest. The adventure concludes when a message is sent to the mayor, signifying the completion of the mission *(Fig.79-88)*. This phase fosters shared experiences and allows for self-expression, aligning with effective consumer-product strategies (Mugge, 2007).

Crucial aspect for this stage of the experience is to have an account with mapy.cz that entitles an email address from which the mail is sent. If somehow connecting the game with the email account is or is not possible is an area for further research. It is expected that there might be a way as the mapy.cz and the email account email.cz falls under the same entity the Seznam.cz. If it was in the end evaluated to be impossible, it is suggested that the way to end the game would be submitting a screenshot of a notification or some other proof that the email to the mayor's email address was successfully sent.

4.4.4.1.5 POST/LATE USE

The final phase presents suggestions for future use, leveraging the gained memories and objects from the experience to enhance the continuity of the service. These include the AI-generated redrawn photo and the quest map, which could potentially be incorporated into future games. Additionally, the points earned during the experience will be utilized in subsequent games to improve the chances of winning. The adjusted photo created during the experience will be automatically saved to the phone's photo library, offering the option to print it out or use it as a screensaver, serving as a delightful reminder of the enjoyable day.

Children will have the opportunity to receive a personalized PDF badge featuring the adjusted photo, which they can print out and color. The badge will reflect the branding style of the entire experience, allowing children to showcase it as a form of social proof. By attaching the badge to their clothes or bags, they can easily identify and connect with other children who also possess the badge, potentially fostering a situation of liking (Gulden & Moestue, 2011)

The synthesized model, encompassing all the principles, LOA, and CPA strategies applied, is provided in the Appendix on page 38. It includes comprehensive details that were omitted from the descriptive part to maintain brevity.

Figure 69. A journey map of the Brownfield Quest - Parents/Caretakers and their children, Appendix p.58
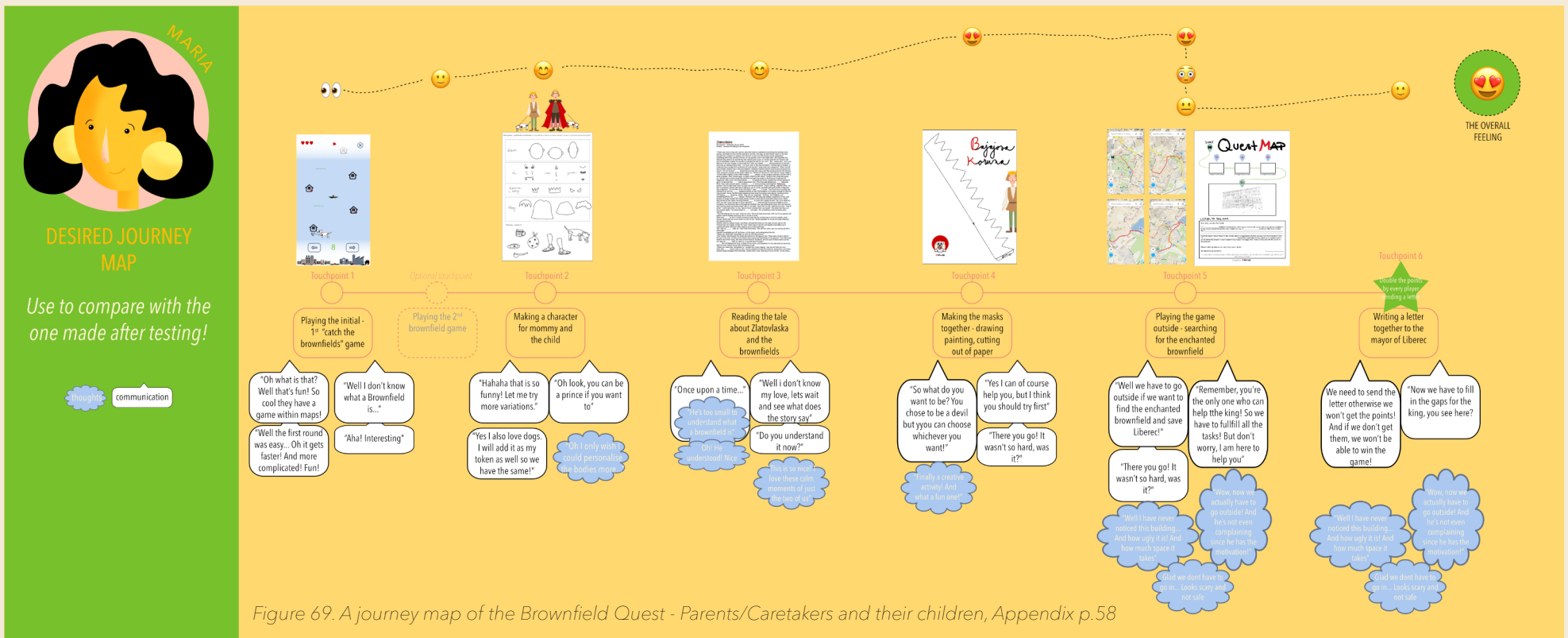
The story

The enchanted brownfield

the servant - character of your child
he/she - choose one fitting to the character

"There was once a king who was so wise that he/she understood everything the animals were saying. And listen to how he learned to do that. One day, an old woman came to him and brought him a snake in a basket, and told him to eat it so that he would understand everything that every animal in the air, on the ground, and in the water said. The king liked the idea of being able to do something that nobody else could, so he paid the old woman well and immediately ordered his servant to prepare the fish for his lunch. 'But,' he said, 'don't you dare put it on your tongue, or you'll pay for it with your head!' Servant named _____ was puzzled as to why the king was so adamant about this. 'I've never seen a fish like this before,' he/she said to himself, 'it looks just like a snake! And what kind of cook wouldn't taste what he's preparing?' When the fish was cooked, he/she took a bite and tasted it. Suddenly he/she heard a buzzing sound around his mouth: 'Us too! Us too!' _____ looked around and saw only a few flies buzzing around the kitchen. Then someone outside on the street called out, 'Where to? Where to?' And thinner voices replied, 'To the miller's barley, to the miller's barley.' _____ looked out the window and saw a drover with a flock of geese. 'Aha!' he/she said, 'so that's what the fish does?' He/she knew what was going on. He/she took another small bite and then brought the snake to the king as if nothing had happened. After lunch, the king ordered _____ to saddle his horse, saying that he/she wanted to go for a ride and that _____ was to accompany him. The king rode ahead and _____ followed. When they rode across a green meadow, _____ 's horse pranced and neighed: 'Hohohoho, brother, I feel so light that I want to jump over the mountains!' 'That's nothing,' said the other, 'I'd like to jump too, but the old man is sitting on me: if I jump, he'll fall to the ground like a bag and tear a ligament. 'Let him fall, what's the harm?' said _____ 's horse. 'You'll just carry a young man instead of an old one.' _____ laughed heartily at their conversation, but quietly enough so that the king wouldn't know. But the king understood well what the horses were saying, turned around, and seeing _____ laughing, asked, 'Why are you laughing?' 'Nothing, Your Majesty, just something struck me,' _____ replied. However, the old king was already suspicious of him, and he/she no longer trusted the horses either; he/she turned around and went back home. When they arrived at the castle, the king ordered _____ to pour him a glass of wine. 'But your head will roll if you don't pour enough or if you spill any!' _____ took the jug of wine and began to pour. Suddenly, two little birds flew in through the window; one was chasing the other, and the one that was running away teasing him. 'What did you just say?,' said the one bird. "It is a brownfield!" said the other. "But what is it again?" said the second. "It is an old scary looking building and it is enchanted! And there's more of them and they will take over the kingdom! And the only way to save us all is to turn them into something else and only the king has the power to do so! And he doesn't care so we are all dooooooomed! And I told you so, but you didn't listen to me because you are a dummy!' 'I heard you I just did not believe you! Better to avoid that building!' The birds then flew out the window again. The king looked at _____ and said, 'You understood what the birds were saying!" and _____ looked down and saw that he poured too much wine and spilled.
"Your life belongs to me now!" cried the king. "But I will deal graciously with you! I now have the knowledge about the brownfield, but I am far too important to go and see it for myself. So you will find the brownfield and tell me how it looks like so I can recognise one when I see it! I need to save my kingdom!" and then he paused and continued "Not only you'll describe how it looks! You will also think of what we can turn into it! I need to make my people happy so they vote for me to be a king forever!"

one more pause "and you have to take one of the two tokens that are dearest to you as a lucky charm. I can't risk you getting killed before I get your message! But if you want to keep your life, you have to provide me with a proof that you did what I told you. When you find the enchanted brownfield, you must take a photo of you, the token and the brownfield. Only then you get your life back! " "Oh, and you have only one day to finish the task!"
What was _____ to do? If he/she wanted to save his life, he/she had to find the enchanted brownfield monster, even though he/she did not know where to look for it. He/she saddled his horse and rode wherever his/hers intuition led him.
He/she came to a black forest, and there, beneath the trees by the road, a bush was on fire. Thieves had set it alight. Under the bush, there was an ant hill, and sparks were falling on it, causing the ants with their white eggs to scurry here and there.
"Oh, help us, _____ , help us," they cried mournfully. "We will burn alive, and our young will die in their eggs."
He/she immediately got off his horse, cut the bush, and extinguished the fire.
"To repay your kind deed, we will help you with anything you need." and the servant said "I need to find the enchanted brownfield to get my life back from the king. Do you know where I can find it?" " Well sadly we don't know about no brownfield. But we know who might help you! There is a man that never moves and above his head in the trees, there is a birds nest. In that nest lives a very smart mother bird. She saw everything and know everything. She'll tell you where the brownfield is!"
Then he/she rode through the forest and came to a man that never moves. There was a birds nest butt instead of in the tree, It was lying on the ground with a little bird next to it. _____ quickly got off of his/her horse and put the nest back into the tree and the baby bird to the nest. Suddenly the wise mother bird flew to the nest too and says: "Thank you oh dear _____! You saved my little one from being eaten by wolves. For that I am eternally grateful. Can I repay you the good deed somehow?" "I am looking for an enchanted brownfield, have you seen it? It is supposed to be old and ugly building". The bird says: "Oh no I have been searching for help that I did not notice anything. But I know who can help you! There's a little fish in a nearby water. Go there and ask her."

After that, He/she walked through the forest for a long time, and when he/she finally emerged from the forest, he/she saw a vast, wide sea in front of him. Nearby the shore in the water, there was one small and sad looking fish. The servant asked her what is the matter and she said:"My best friend, the butterfly, he can never find me because the sea is so big and he always forgets where we agreed to meet up." "Say no more" said the servant and made a big mark on the ground "this way the butterfly will see this mark far from the skies and knows where you are waiting!"

Suddenly happily splashing out of water, she immersed herself and then near the shore, she stuck her head out again: 'Thank you dearly for saving my friendship! How can I ever repay you?' And the servant says: 'I am going to my master, the old king, to find him this scary looking old building, the enchanted brownfield, and I do not even know where to find it! 'Oh, I can tell you about it,' said the fish. Butterfly told me about it the last time we met! Just follow where the water can't and you'll soon find it!"

_____ was a bit lost at first, but then he/she understood and ran as fast as he/she could to where he/she thought the brownfield was. And soon enough he/she found it. It was bigger and uglier than he/she anticipated and there was nothing enchanting about it. It was quite the opposite! The brownfield looked cursed!

_____ took the photo very fast and truth to be told, it was from a distance, but it was good enough! He/she stayed far from it, in a safe distance, just so the brownfield did not notice him/her. In the last moment, he/she remembered to take the token up so it was visible in the photo as well. Wouldn't want to lose my life over such a silly mistake, he/she thought.
Then _____ sat down and drew what could the king turn the brownfield into that would make the people of his kingdom happy.

After the drawing was finished, he/she suddenly felt so tired. He/she knew he/she had to get the message to the king before dawn, but it was too far to walk back to the castle and legs were very tired. So instead _____ went home and sent all the things requested by mail. He/she sent the drawing, the description and the photo.

After that he/she ate a big piece of cake and went to bed knowing he/she just saved the whole kingdom. During the night he had a dream, that all the cursed brownfields disappeared from the land and turned into schools, playgrounds and kindergartens. Some of them even turned into cake shops with the most delicious cake under the sun. And all the people were laughing and dancing and praising _____ for saving their kingdom.

Hurray _____! Hurray_____! Hurray_____!

THE END

MAPY.CZ

ENG

START

Quest MAP

1st shape from the screen   2nd shape from the screen   3rd shape from the screen

LETTER TO THE KING

Dear king Jaroslav Zámečník,

vl (1)_____ fulfilled the quest and now it is your turn to act, so we can save Liberec together!
I found the enchanted Brownfield and I think it is now (2)_____ and I don't like that. It looks like(3)_____
_____
For that reason I have drawn in the picture above a suggestion of what you can turn the brownfield into!
(4)_____ would be much better to have there in my opinion and it would make the people in your kingdom very happy! So happy that I believe they will vote for you to be king forever!

Please fulfill my wish so we can finally save Liberec!

All hail the King Zámečník!

(1)_____

(1) your name, (2) what do you dislike about the brownfield?, (3) describe the brownfield, (4) what is your idea that you drew?

Created by MAPY.CZ

Partial preview of the designed PDF printable document - Caretakers and children

Figure 70. - 78. Preview of parts of the printable PDF document for the Brownfield Quest - Parents/Caretakers and their children
Appendix pages 40-57

Preview of the designed interface for the 'Brownfield Quest' - Caretakers and children

Figure 79. - 88. The designed interface of The Brownfield Quest - Parents/Caretakers and their Children, Appendix page 39

Testing

The final phase involves assembling a small testing group consisting of two children, aged 3 to 6, to evaluate the proposed experience *(Fig.89-92)*. Due to the complexity of the experience and the need for implementation into mapy.cz, the testing focused on the PRE-POP, POP, and initial workshop of the PRODUCT phase. To accommodate time constraints, the experience was condensed into a single day, omitting the waiting parameter that potentially contributes to creating desire. Thus, the multi-day aspect of the proposed experience was not tested in this experiment, suggesting untapped potential for further exploration.
In the priming phase, the children were asked if they knew what a brownfield was, and both responded with a resounding "no." Although the topic initially sparked curiosity, the discussion swiftly shifted to their visit to the movie theater that day, diverting attention away from brownfields entirely.

Proceeding with the experiment, the next stage of the PRE-POP phase involved creating the hero figures. The older girl exhibited immediate enthusiasm, cutting out paper parts and sharing imaginative ideas like gluing two hair pieces together: "Oh! I know what I can do! I can take two hair and glue them on top of each other. But I already glued the head on…", showcasing imaginative activation beyond the provided guidelines.
However, she encountered a roadblock when asked to choose a talisman and name the figure. To reignite her interest, an impromptu additive approach representing the skills of a designers improvisation was introduced, assigning numbers to the talisman images and employing dice to determine the selection. While the girl's enthusiasm remained somewhat subdued, she ultimately settled on the dog talisman. In contrast, the younger boy initially opted out of creating figures but later returned to the table after observing from a distance. He selected a figure for himself and

actively engaged in the process, demonstrating both imaginative activation and cognitive development through the challenging task of gluing.
    Notably, the boy's mother assisted with cutting due to the delicacy of the shapes, as they exceeded the three-year-old's cutting skills. Overcoming the naming challenge, the concept of creating a hero to save Liberec was explained, leading the girl to choose the name "Anička" (a Czech variation of Anna). The motivation behind her choice appeared to stem from the principle of liking, as she identified with the workshop leader named Anna, thereby enhancing relational activation (Gulden, 2013). Following the character creation, the children became curious about what the hero needed to save Liberec from, further deepening their desire to continue the experiment. However, the younger boy opted to watch TV and did not participate further, despite seemingly enjoying the experience. His mother however explained that he is already very tired from the activities done that day before the experience.

The tale was exclusively read to the girl, but her focus was often disrupted by the presence of a TV and other people in the background. Consequently, when asked about the tale's content, she admitted uncertainty. A discussion ensued, reinforcing the definition of a brownfield provided in the tale, and at that point, she appeared to grasp the concept.
The experiment progressed to the final step of creating the character's attributes. The girl questioned the purpose behind this step, leading to the revelation of the project's intentions and the introduction of the quest map. Upon seeing the map, she immediately made connections to elements mentioned in the tale, suggesting that initial confusion arose from inattentiveness during the conversation rather than the tale itself, as it lacked sufficient activation for a young child. The visuality of the quest map enhanced imaginative activation and triggered recollection of the tale's events, facilitating the learning activation regarding brownfields.

The product testing

Figure 89. - 92. The designed interface of The Brownfield Quest - Parents/Caretakers and their Children, Appendix p.37

Evaluation

The actual sending of an email to the mayor was not tested; however, the focus was on evaluating whether the children gained an understanding of what a brownfield is. Thus, the experiment aimed to determine if the product has the potential to fulfill at least one of the two defined objectives. Based on the findings it is concluded that the proposed structure does in fact have the educational measure and can serve to reaching the stated goal.

Regarding Plenteous play (Gulden, 2016), only partial engagement was observed. Instead of drawing the figure's head entirely on their own, the children preferred to stay within the branding framework. Evaluating LOA (Gulden, 2013), all the anticipated activations were confirmed, with cognitive activation during gluing and consistent imaginative engagement being the most significant aspects throughout the entire experience.

4.4.4.2 Engagement of the users defined by mapy.cz navigation

The game is built upon the 'one man's brownfield, another man's treasure' game, where the players learned about what actual brownfields are nearby their location. If the players missed this step, there's a reminder of the discussed brownfields in the beginning of the game.

First the user creates his character from parts that are, except for the colors, exactly the same as they are in the children's experience. Thus, the users are affected in a similar way as the kids - there's enhanced the Imaginative activation (Gulden, 2013) and the attachment to the product is strenghtened by the consumer attachment strategy of personalization and self-expression (Mugge, 2007). The figures themselves weren't really incorporated into the designed games, except for the selection of talismans as one of the defining element of the keying applied to the game. However, it is intended that the created figures are saved to the account of each player, can be recreated at any point of the duration of the service, and can carry potential in their utilization in the development of future games within the service.

The **framing** (Gulden, 2021b) for the game is; going outside with your mobile phone that has installed mapy.cz and playing the game provided by mapy.cz following the presented rules in order to collect points.

The **keying** (Gulden, 2021b) of the experience is; Every time you find a brownfield you earn points. The faster you find it the more points you get. However, based on your form of transport selection, there will be either bonuses or obstacles defined by the selection of the talisman for your character. For every time you ask for a clue to find a brownfield, you lose some points.
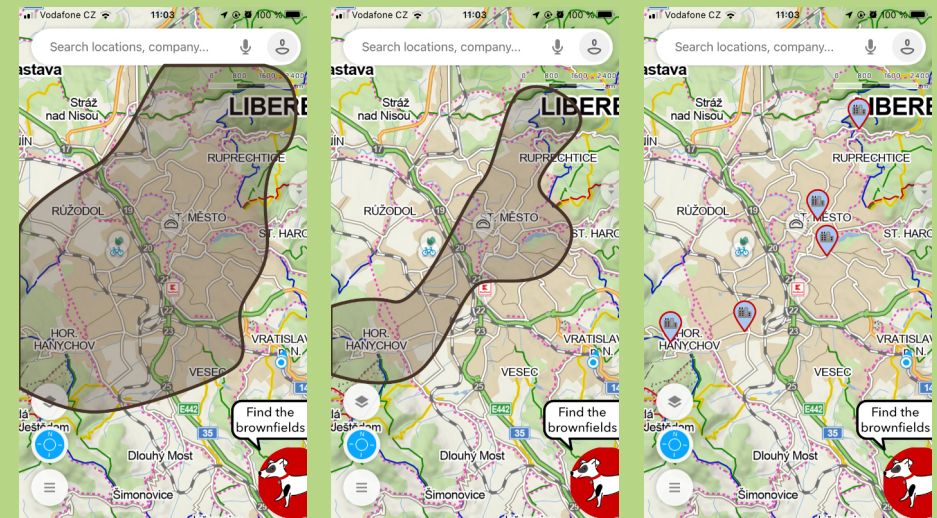
Figure 93.-95. Examples of clues for location narrowing

Example case of keying:
Imagine the user has chosen to reach their destination by car, but one of the character's talismans they selected at the beginning was beer. In this scenario, the proposal suggests that obstacles be introduced into the experience, making it extremely challenging to complete the task and earn the points needed to win a prize. This type of approach may cause some frustration, but it can actually enhance the enjoyment factor and deepen the desire (Gulden, 2021c) to continue playing the game.

Preview of the designed interface for the 'Brownfield Quest' - the rest of the mapy.cz users
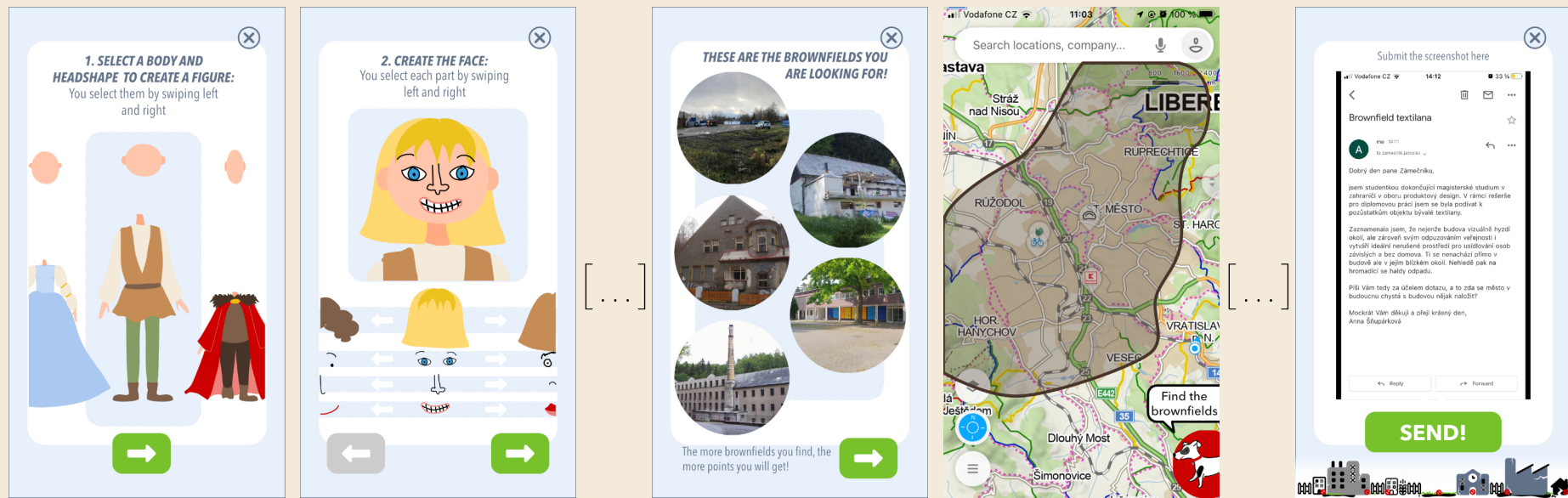
Figure 96.-100. Examples of the 3ʳᵈ game for the rest of the users interface, Appendix page 59

END OF THE PRODUCT

5 CONCLUSION

5.1 The learning outcomes from the Master's Degree Programme in Product Design assisting in the creation of the ‚Using Service Design to Bring Life to Abandoned Buildings and Brownfields in Liberec Region' thesis

The master thesis showcases the expertise gained from the master course in comprehending and adapting design methods, specified in the chapter titled "Navigation through the designing process - design research and methodology." The methods utilized in this research originate from both practical industry practices and scientific sources. The paper demonstrates an expanded skill and knowledge base acquired during the master course by combining and adjusting chosen methods with other approaches from the design field. This approach aims to develop the most suitable tools for the specific context of the designed project. The paper illustrates this by incorporating the Design Thinking Framework alongside methods from the Design for Experience context, within the personalized Double Diamond framework, and also in greater detail through the synthesized Context of Experience model.

It is worth mentioning that without the Master's Degree Programme in Product Design, the understanding of how to conduct and present research as a designer at an academic level would not have been possible. Adopted through the course was also an extensive knowledge base on sustainability represented in this paper by the following; The course introduced the 17 Sustainable Development Goals from the United Nations, which emphasized the importance of focusing on Brownfields due to the preservation of biodiversity, as well as principles and approaches related to sustainability found in resources like the Sustainability Handbook that highlight the need for land recycling. The Cradle to Cradle book further guided the shift from a global perspective to a local one, enhancing sustainability measures for the proposed service.

To demonstrate the designer's ability to develop design solutions for society beyond the confines of a computer screen or research documents, there are presented interviews with relevant stakeholders which were conducted, and an experiment that was facilitated to partially test the proposed gamified service. Implementing such approach brought an enormous contribution to the designing process as it enhanced the use of holistic approach to design, adapted through the master studies, and narrowed the focus of the product development towards general public and their needs in connection to behavioral change.

The skills honed through the course, as further exemplified in this master thesis, primarily revolve around the Context of Experience synthesized approaches. These were applied multiple times in the service development stages to ensure the design of a service that is engaging, exciting, and immersive, thus increasing its potential popularity and utilization among the defined user groups. This is perceived as crucial for successfully achieving the goals outlined in the thesis, which include educating the general public about brownfield issues and activating them to potentially reduce the overall number of brownfields in Czechia by supporting their revitalization efforts.

5.2 Main findings of areas for a product designer's contribution

The intial research mainly discussed in the chapters 2. and 3. of this paper attempted to introduce the reader into the big system and structure that define the brownfield problematics. As the project continued to the designing stage of the master thesis, the findings from the research phase were evaluated and only those relevant to the final focus of this thesis were enclosed. However, the findings discovered through the research far extend the scope of the chosen focus of the master thesis and offer many other areas that would benefit from an designer's contribution.

The presented research focuses on the stage before brownfield revitalization. It focuses on the systemic perspective and tries to offer a solution that would impact more brownfields than just one. Nonetheless product designers abilities can be utilized in the revitalization processes as well for example through it's focus on human needs and collaborative approaches that are, as discussed, most likely not common in the Czech Republic.

Another area discovered through the research suitable for product designer's contribution to the situation regarding brownfields in Czech was the creation of a digital tool such a web application, discussed in the chapter '3.2.4.3. Areas of focus/pain points - the importance of user involvement in Human Centered Design product development', providing the stakeholders of the system with necessary information regarding brownfields in Czechia and the processes needed for their revitalization. As it was mentioned, the initial assumption that this product is something that would the Czech Republic benefit the most from thus the contribution of the designer would be significant, was affirmed through the development of such tool initiated by the CzechInvest agency, which is the main entity connected to brownfield problematics and revitalization in Czechia, that was published in the duration of this master project.

Although the project somewhat lacks the comprehensive focus gained through the master studies' giga-mapping approach, elements such as the minnd map including the ZIP analysis or the visual map, utilization of the iceberg model, highlighting the dynamics of the proposed service through the use of balancing and reinfocing feedback loops, and Donella's ladder of leverage points were covered in order to gain better understanding of the discussed societal levels structures of stakeholders in the system, understanding the crucial leverage points in the system and applying the gained knowledge in the designing of the proposed service. However, recognizing the value of giga-mapping as an information conveying tool, it is recommended to be utilized in great extend for future project proceedings given the complexity of the issue at hand showcasing another approach in which can a designer contribute to the brownfield situation in Czechia by providing a giga map assisting towards clearer understanding of the system.

Last one selected to be presented in the conclusion on the potential areas for designers contribution regarding brownfields, was the one perceived to be the most important one form the sustainability of the future perspective. The focus of the master project went towards the problematics of already existing brownfields and how to reduce the number by activating people to contribute to their revitalization through pressuring the municipal leaderships. Thus the service provided by this thesis is merely an end of the pipe solution that deals with an already existing problem, and to really initiate a shift for the better in the future, designers should invest their skills and time into connecting relevant stakeholders and together developing a system preventing brownfields from even appearing. Suggested focus for developing such system, based on the findings from this thesis, would be forecasting societal changes such as the current shift from non-renewable energy sources to the renewable ones that lead to the emergence of brownfields that once were for example coal mining locations.

Although the research question specifically narrows the focus to the environment of the Czech Republic, all of the above proposed gamified products that create the service are adjustable to other Czech regions, thus can be in fact utilized in other countries battling with brownfields problematics as well. With the consistent use of COE for the potential future changes other nations can in fact redesign the service while adopting the same principles, but with the framing focused on the specific chosen area or country, since there is no limitation stopping them from doing so. The thesis can thus not only induce positive change within Czechia, as it has qualities providing other countries adopt presented approach reflecting the potential global impact this master thesis possess.

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5.3 Reflections about the solution

Based on the insights derived from the conducted experiment, it can be inferred that the designed innovative service holds promise as a priming experience for the overall service. Thus by example answers the stated research question by saying, that the Context of Experience approach has the potential to contribute to the brownfield problematics through its application when developing a Service Design based product that utilizes the toolkit for Design for Experience, including COE.

However, it is important to note that due to the limited number of participants (only two) and the testing of only a small portion of the proposed solution, drawing definitive conclusions is not possible. To fully develop and refine the entire experience in a way that positively contributes to the defined goals, it is recommended to include additional testing groups and iterate on the service based on the evaluation of the newly acquired insights.

Furthermore, the proposed service has the potential to be adapted by other countries for their online map products, or utilize also the suggested mapy.cz as their accuracy is internationally also quite remarkable compared to other maps. This highlights the beneficial contribution of the designer on both a local and global scale. It should be emphasized, that when considering the global implementation of the service in other countries, each product inspired by this gamified approach would need to be tailored to the local context in order to maintain the proposed structure and approach. This ensures that the global impact contributes to sustainability measures, as it is expected that more countries would proactively engage in brownfield revitalization while avoiding the design of systems that disregard sustainability principles.

5.4 Personal note

Growing up in Czechia, I had the privilege of being surrounded by familiar sights and norms, but I didn't fully appreciate the possibility of a different reality. This included occasional litter on the ground, abandoned buildings with graffiti, and the prevalence from the communist era of prefab panel blocks in suburban areas where many Prague residents live. However, my three-year stay on Voksenkollen hill in Norway and my subsequent return to Czechia had a profound impact on how I perceive our environment and my role and contribution to it, and I am deeply grateful for that experience. Witnessing the higher standards in Norway inspired me to take action, which is reflected in this research paper.

While brownfields are just one aspect affecting the visual appeal of Czech municipalities, the overall condition of Czech buildings calls for comprehensive intervention and reconstruction. Radovan Baloun highlighted that the state of buildings in each location is closely tied to the socioeconomic status and GDP of municipalities (Baloun, 2023). Consequently, locations with lower GDP often require even greater efforts in revitalizing the building stock. Additionally, the conference proceedings magazine "Brownfieldy - Ostrava" emphasizes the positive relationship between urban area renovations, cleanliness, and reduced vandalism (Brownfieldy - Ostrava, 2022).

The Guidebook to European Building Policy serves as a valuable resource for achieving the full decarbonization of the EU building stock by 2050. It places great emphasis on building renovation and modernization (Fabbri et al., 2020). Fortunately, initiatives like the 'Zelená úsporám' funds ("Nová Zelená Úsporám," 2021) provide state support in Czechia that aligns with the mentioned decarbonization approaches, offering assistance to homeowners undertaking renovation efforts.

I am immensely grateful that in the Czech Republic, the issue of the buildings stock physical state and more specifically brownfields are gaining more attention. I am grateful that there already exist entities such as CzechInvest which are already working towards revitalizing a significant number of brownfields, that wouldn't have been possible without their efforts.

However, in a scenario where all brownfields are renovated, based in the above stated, the visible transformation of the Czech urban environment may not be as profound as one might hope for. Nonetheless every change starts somewhere, and in Czechia, the transformation of the brownfield situation is already underway, mainly thanks to the dedication of CzechInvest. Therefore, this paper holds great significance in its contribution to the ongoing changes by spreading awareness and facilitating further positive change.

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