TU WIEN Informatics

Participation in Public Places

Ermöglichungsflächen at Seestadt Aspern

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TU WIEN Informatics

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Kristina Schiechl

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Kurzfassung

In den letzten Jahren hat die Beteiligung der Bürger an der Gestaltung des öffentlichen Raums in Wien zunehmend an Bedeutung gewonnen. Partizipation ist eine Möglichkeit, um die Bevölkerung in einschlägige Planungsprozesse zu integrieren. *Ermöglichungsflächen* stellen diesbezüglich eine neue Strategie dar; diese Flächen befinden sich derzeit in der Seestadt Aspern. Die BewohnerInnen der Seestadt Aspern sollen sich etwa ein bis zwei Jahre nach der Erstbelegung des Bezirks (Erstbezug 2014) für den öffentlichen Raum engagieren. Derzeit hat diese Beteiligung noch nicht stattgefunden. Die Gestaltung von *Ermöglichungsflächen* ist eine interdisziplinäre Aufgabe.

Die vorliegende Arbeit sammelt und erfasst das relevante Fachwissen entsprechender Disziplinen zu, um Bewusstsein für die *Ermöglichungsflächen* zu schaffen und die Beteiligung an der Mitgestaltung zu fördern. Darüber hinaus werden in dieser Arbeit folgende Forschungsfragen beantwortet: *Welche Voraussetzungen müssen geschaffen werden, um ein nachhaltiges sozio-technisches System im öffentlichen Raum zu schaffen und umzusetzen?*, *Wie können Menschen für eine nachhaltige Nutzung des öffentlichen Raums sensibilisiert und motiviert werden?*, *Welche technische Lösung kann diese Prozesse unterstützen und welche Funktionalitäten sollte sie haben?*

Mit Hilfe einer Literaturrecherche wurden Themen untersucht, die die Grundlage für die Beantwortung der Forschungsfragen und die Erstellung eines Prototyps bilden. Weiterhin wurden diesbezüglich Experteninterviews, Beobachtungen, Online-Befragungen und Interviews mit BewohnerInnen der Stadt Wien durchgeführt.

Die Ergebnisse dieser Thesis zeigen, dass die entwickelte App Menschen auf *Ermöglichungsflächen* aufmerksam macht, deren Mitgestaltung erleichtern kann und die Beteiligung fördert. So wird der Einreichungsprozess erleichtert und die BürgerInnen werden in den gesamten Prozess und das Verfahren einbezogen.

Abstract

In recent years, participation in the design of public spaces in Vienna has become increasingly important. Participation is a way to promote citizen involvement in planning process. *Ermöglichungsflächen* represent a new strategy to involve the people of Vienna to participate in co-creation; these areas are currently located in Seestadt Aspern. The residents of Seestadt Aspern should participate in public space around one to two years after first occupancy in the district (first occupancy 2014). Currently, this participation still has not taken place. The design of *Ermöglichungsflächen* is an interdisciplinary task and in order to truly meet all wishes and requirements, expertise is needed in various fields.

This thesis aims to help collect, record and combine the relevant expertise of different disciplines to create awareness and promote participation in the co-creation of *Ermöglichungsflächen*. Furthermore, this thesis answers three research questions: *Which preconditions need to be established to create and implement a sustainable socio-technical system in a public space?*, *How can people be made aware of and be motivated to use public space in a sustainable way?*, *Which technological solutions can support these processes, and what functionalities should such a technological solution have?*

With the help of a literature search, a variety of topics were investigated to form the basis for answering the research questions and creating the prototype. Furthermore, expert interviews, observations, an online survey and interviews with residents of the City of Vienna were conducted to answer the research questions.

The results of the thesis demonstrate that the app that was developed can make people aware of *Ermöglichungsflächen* and facilitate the co-design of these areas. The participation of residents in the design of the *Ermöglichungsflächen* is encouraged through the app, and the submission process is facilitated so that they are involved in the entire process and procedure.

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CHAPTER 1

Introduction

1.1 Problem Statement

More and more people are using the public spaces of Vienna [72, 89]. These areas are no longer seen only as transportation space but now serve more for recreation and invite people to linger. The co-creation of public space has become increasingly important to the inhabitants of Vienna. Public leaders are therefore endeavoring to involve residents more in the design of public space and promote their participation. *Ermöglichungsflächen* (English: areas of opportunity, enabling areas, white spaces) represent a new strategy to involve the public and encourage the inhabitants of Vienna to participate in co-creation.

Ermöglichungsflächen are open spaces that are designed during the planning process of new neighborhoods and thus enable later design and participation of people. Residents are able to design these areas according to their own requirements and thus identify more quickly with the new district. In the planning of Seestadt Aspern, *Ermöglichungsflächen* were planned at various locations, such as along the Maria-Tusch-Straße. According to the *Fachkonzept öffentlicher Raum* [72, p. 73] of the City of Vienna, the residents of Seestadt Aspern should commit to public space around one to two years after first occupancy in the district (first occupancy 2014 [132, p. 12]). Currently this participation still has not taken place.

In recent years, participation in the design of public spaces in Vienna has become increasingly important [89]. Participation is a way of promoting citizen involvement and not relying solely on the professionals in the planning process. Regardless of origin, citizenship or language skills all inhabitants of the City of Vienna should be considered. Addressing the needs and requirements of different individuals can be very difficult. Furthermore, not only the wishes of the residents but also those of the city must be taken into account. The city itself consists of different magistrates, offices, companies etc. and the goals and regulations of these stakeholders must also be considered.

Regarding possibilities for public participation during the design of *Ermöglichungsflächen*, coordination of the citizens is the responsibility of the respective municipal authorities (MA 42 park design, MA 21 for district planning and land use, MA 19 for urban planning of places), district representatives, planning companies, *lokale Agenda* and area management [89, p. 9, 10]. In addition, most *Ermöglichungsflächen* do not have a sewer services, electricity or Internet. The City of Vienna assigns these functions to different magistrates. This problem is illustrated in Figure 1.1. It creates the challenge of applying for approval from different magistrates. In summary, the needs and regulations of the residents and the city must be examined so that a design of the *Ermöglichungsflächen* can be made possible.

The design of *Ermöglichungsflächen* is an interdisciplinary task. In order to truly meet all wishes and requirements, expertise is needed in various fields, such as computer science, spatial planning, sociology, and psychology. This thesis aims to help collect, record and coordinate the relevant expertise of different disciplines and implement a technical solution. Only in this way it can be ensured that an innovative and technical solution will be found that is functional for the inhabitants and accepted by the City of Vienna.

1.2 Aim of the Work

The purpose and aim of this work can be reached by three major steps:

Investigate - Create awareness and promote participation - Create a prototype

First, the reason *Ermöglichungsflächen* are not accepted by the inhabitants of Seestadt Aspern will be investigated. The question arises of whether enough information material has been provided and the residents have been informed of the existence of these areas. Research will be carried out to assess the extent to which residents were involved in the development process (participation process), whether they are aware the open spaces exist, why they have not used the spaces and what they need to make use of these areas. In addition, expert opinions will be used to investigate how the planning of these areas was done, what the goals were, what the expectations were and are for these areas and why experts believe the spaces have not been accepted by residents. The design of *Ermöglichungsflächen* is an interdisciplinary task, meaning comprehensive knowledge in varied areas should be acquired.

Today, more people are living in cities, resulting in urban densification. People are living closer and closer together, but as Wellman [148, p. 228] correctly stated “physical closeness does not mean social closeness.” For the author of this thesis it is very important that the use of public places is promoted. Therefore, in a second step, this thesis will investigate how people’s awareness can be directed toward *Ermöglichungsflächen* and how people’s participation can be promoted. People should have the opportunity to help shape the spaces in which they are living in. This research will assess what other cities

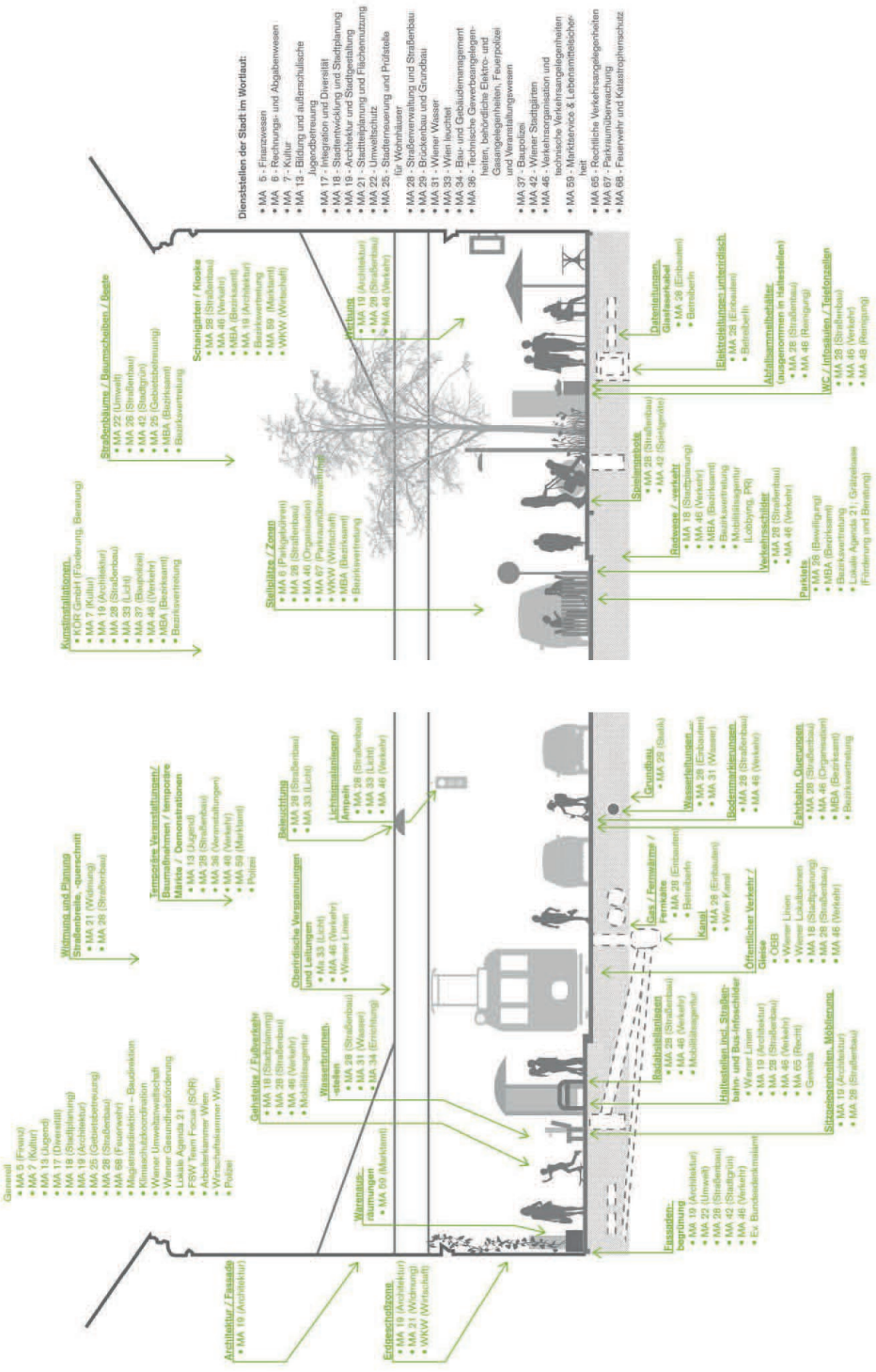


Figure 1.1: Jurisdictions for public space in Vienna [72, p. 56, 57].

have done and whether these strategies or technological innovations can be transferred to the City of Vienna.

In the final step, a prototype of a socio-technical system will be developed that can be used in the urban area, more precisely on the *Ermöglichungsflächen*, and brings awareness to these spaces. Through urban informatics, the question of whether a socio-technical system is helpful should be answered. Urban informatics is an area that deals with technology in urban spaces.

In summary, this means that three research questions will be answered:

1. Which preconditions need to be established to create and implement a sustainable socio-technical system in a public space?
2. How can people be made aware and motivated to use public space in a sustainable way?
3. Which technological solution can support these processes and what functionalities should such a technological solution have?

1.3 Structure of the Work

The design and implementation of a socio-technical system in public space is a multidisciplinary task. Knowledge in various the fields is needed.

Part I Theoretical Foundation of this thesis therefore explores the topics urban development, public space, *Ermöglichungsflächen* at Seestadt Aspern, participation, co-creation, appropriation, approval and submission of a project to the City of Vienna, placemaking and urban informatics. Furthermore, user experience research methods needed for the extraction and collection of quantitative and qualitative data and the development of a prototype are discussed. These topics form the basis for answering the research questions and for the development of a prototype of a socio-technical system.

Part II Practical Part of this thesis consists of two parts and presents all Applied User Experience Research Methods. The first part presents the User Research Methods (URM) used for the collection of quantitative and qualitative data. Furthermore, the implementation, execution, data analysis and results of each method are described. A total of four URM were applied (see Chapters 6.1 Expert Interviews, 6.2 Observation, 6.3 Online Survey and 6.4 Interviews). The second section of this part deals with the development of a prototype. The development process, the idea for the prototype and the prototyping process are described in detail (see Chapter 7 Prototyping).

Part III Analysis & Future Work is the last part of this thesis, and the first Chapter 8 Analysis & Discussion answers the three research questions. A connection between the theoretical discussion, the work of others, and the methods and results of this study is established and reflected on. Chapter 9 Future Work & Limitations discusses the limitations of the work and possible ideas for further development.

Part I

Theoretical Foundations

Part I Theoretical Foundation of this thesis explores theoretical foundations to answer the three research questions as well as basic methods to develop a prototype for a socio-technical system. The design of such a system as well as the design of public spaces is a multidisciplinary task. In order to truly meet all wishes and goals, expertise in various fields is needed, including computer science, spatial planning, sociology, psychology and the city itself. Thus, the thesis explores these different topics.

Chapter 2 Urban Development discusses the foundations for the development of a system in public space and the answer to the research question: "Which preconditions are needed to develop and install a sustainable socio-technical system in a public space?" The thesis therefore explores urban development and the basic strategies of the Vienna Urban Development Plan. Furthermore, the objectives of public space, the tool *Ermöglichungsfläche*, as well as the submission and implementation of a project in public space in the City of Vienna are discussed.

In Chapter 3 Participation, Co-Creation & Appropriation and part of Chapter 4 People, Place & Technology, the thesis explores the theoretical foundations to answer the second research question: "How can people be made aware and motivated to use public space in a sustainable way?" In order to answer this question, the topics of participation, co-creation, appropriation and placemaking are discussed. These chapters provide an overview of participation and co-creation in the City of Vienna and explain how people can appropriate a public space. The questions of how public space should be designed and what factors make people feel comfortable and encourage them to use public space are also explored in detail.

In the remaining section of Chapter 4 People, Place & Technology urban informatics is discussed. Chapter 4.6 Urban informatics deals with the connection between people, place and technology and should help to answer the third research question: "Which technological solution can support these processes and what functionalities should such a technological solution have?" Urban informatics "takes a transdisciplinary approach to understanding the city as an ecology that consists of technological, social, and architectural layers" [38, p. 4].

Chapter 5 User Experience Research Methods presents the methods used to obtain the data and the process of developing a prototype. The theoretic basics are explained in more detail.

CHAPTER 2

Urban Development

Urban planning is a process in which the local government defines interventions, regulations, collective choices, organizational design, market corrections, citizen participation and public sector actions [57]. An Urban Development Plan (ger. *Stadtentwicklungsplan* (STEP)) is a tool used to enable forward-looking urban planning and development [164, 163]. This type of plan broadly defines how the city will develop in the near future. The City of Vienna produces a new plan approximately every ten years. The city is constantly examining whether the defined framework conditions are up-to-date, whether the initiatives have been implemented and whether the desired results have been achieved. There is thus an ongoing monitoring and reflection process.

In the current planning of urban development, more attention is being focused on the individual's perspective as well as on society as a whole. Urban planning is increasingly seen as an interdisciplinary approach, which enhances the quality of these plans [107]. Planners seek to consider the whole environment of people and to make a sustainable plan on the basis of a broad understanding.

This chapter explores two different approaches to urban development (bottom-up and top-down urban development), the Urban Development Plan of the City of Vienna (STEP 2025) and the strategies and principles of this plan. Furthermore, this chapter discusses the topics of public space in general, public space in the City of Vienna, the "Specialized Concept of Public Space" and the tool *Ermöglichungsflächen* of Seestadt Aspern.

2.1 Bottom-up & Top-Down Urban Development Approach

There are different approaches to the planning and management of urban development in cities. Vienna uses a combination of bottom-up and top-down approaches and tries to

keep a balance between the two [81].

Top-Down. In a top-down approach, the city government defines a long-term vision and a strategic framework for urban development [81, 80]. This approach seeks to support intelligent urban development. In its STEP, the Vienna city government states that not everything should be predetermined and planned in advance from "above" (i.e., top down) [167].

Bottom-up. The bottom-up approach is deregulated and based on self-organization through which residents are directly involved and solutions are found together [81, 80]. For the bottom-up approach to be successful, the self-initiative of different actors should be facilitated. The City of Vienna tries to encourage people to appropriate the open space and this can only happen through self-initiative. Furthermore, it should be possible for residents to act as co-producers [167].

2.2 Urban Development of the City of Vienna - STEP 2025

The STEP 2025 of the City of Vienna is highly strategic and sets the direction for urban development at the level of society as a whole until the year 2025; it was published in 2014 [167] and forms the basis for all further documents. This plan provides a general overview of the goals and guidelines of the City of Vienna, explaining which principles are important, what factors should to be considered, which strategies are applied, and more. In three extensive chapters, it deals with eight main topics in order to realize Vienna's growth potential and thus provides the basis for the city's development. Various specialized concepts (ger. *Fachkonzept*) and detailed concepts (ger. *Detailkonzept*) have been developed on the basis of this document. A total of seven specialized concepts: (1) Mobility (ger. *Fachkonzept Mobilität*) [133, 157], (2) Green and Open Space (ger. *Fachkonzept Grün- und Freiraum*) [169, 155], (3) Public Space (ger. *Fachkonzept öffentlicher Raum*) [72, 158], (4) Skyscrapers (ger. *Fachkonzept Hochhäuser*) [156], (5) Centers (ger. *Fachkonzept Zentren*) [160], (6) Productive City (ger. *Fachkonzept Produktive Stadt*) [159], (7) Energy Planning (ger. *Fachkonzept Energieplanung*) [154] and one detailed concept (1) Electromobility Strategy (ger. *Detailkonzept Elektromobilitäts-Strategie*) [153] were developed. In order to pursue the goals and principles more effectively, the specialized concepts were developed to address different areas in greater detail and help enact the different measures.

This chapter provides a short overview of the most important issues of the STEP, which are explained in more detail in the STEP itself. For further information, please refer to STEP 2025 [167].

2.2.1 Principles of Vienna's Urban Development

A city should be worth living in for all its inhabitants and should satisfy the wishes and ideas of the entire population, including long-established resident, new residents, every age group, ethnicity, and so on. The City of Vienna has developed nine principles to support this goal. The STEP 2025 document discusses the individual principles in detail and additional documents have been developed that explore the principles further. The principles as well as the other documents are visualized in Figure 2.1.

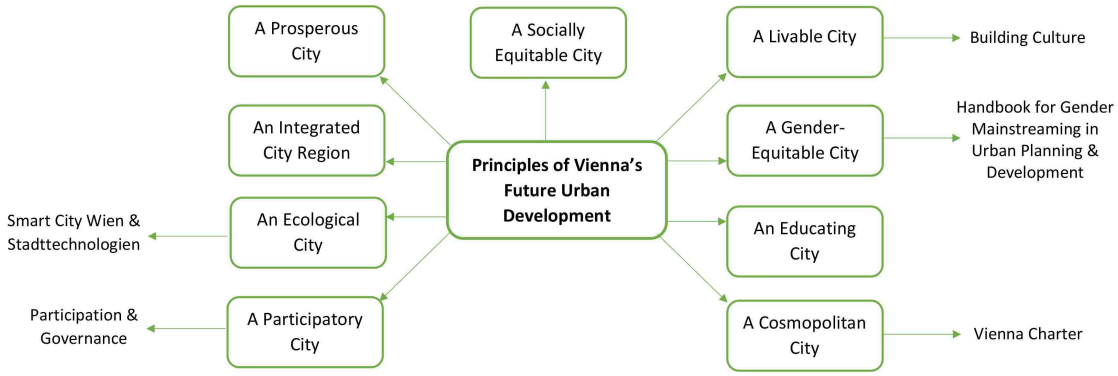


Figure 2.1: The principles of the City of Vienna are depicted in the Figure. In addition, you can see the documents related to the topics. Author's own representation.
References: Building Culture [130], Handbook for Gender Mainstreaming in Urban Planning and Urban Development [65], Vienna Charter [146, 145], Smart City Wien Rahmenstrategie [128], Rahmenstrategie Smart City Wien 2019-2050 [131], Stadttechnologien [134], Master Plan for Participatory Urban Development [129, 7], Governance see Section 2.2.2

2.2.2 Basics & Strategies of STEP 2025

Vienna has changed a great deal in the last few years and has therefore developed four basic strategies are considered essential for successful urban development [168].

A City in Transformation

The City of Vienna is one of the fastest growing metropolises in Europe. In 2030, approximately two million people will live in the city and more than three million people will live in the agglomeration area [168, p. 6]. Changes and developments will be used to make the city more livable, more social, more ecological and more competitive. The strategies and instruments defined in the STEP should enable innovation and promote urban growth with high quality, even as resources become increasingly scarce. Change of the city is seen as a collective task of politics, economy and population.

Governance

In its STEP, Vienna strives for "good governance", which means establishing goal-oriented, partnership-based and transparent cooperation between all stakeholders that works to

improve quality of life and sustainability [167, p. 26]. With the help of "good governance", the City of Vienna aims to define the basic attitude and the objectives to be pursued [167, p. 29]. New forms of cooperation will be developed to represent not only the interests of the public actors, but also those of non-public actors. Rigid rules and mechanisms will be replaced by flexible procedures.

Smart City Wien

The City of Vienna is changing very rapidly. More inhabitants live in the city, natural resources are becoming more scarce and expensive, and demands on the city are increasing [168]. In 2011 Mayor Michael Häupl initiated the transformation of Vienna into a more sustainable urban environment and called this initiative "Smart City Wien[1,2]" [162]. To guarantee the successful development and implementation of a Smart City, a framework strategy was developed in 2014 (see *Smart City Wien Rahmenstrategie 2014* [131]). The second version of this framework strategy entered into force on 26 June 2019 (see *Smart City Wien Rahmenstrategie 2019-2050* [128]).

Cooperation

The participation of the population has become increasingly important and now plays a central role in the urban planning process [168]. From the very beginning, residents are involved in the decision-making process, and there is open and transparent communication between all those involved, which leads back to the concept of governance. This strategy is discussed in more detail in Chapter 3.1.

2.3 Public Places

Public place is defined by United Nations Educational, Scientific and Cultural Organization (UNESCO) as "an area or place that is open and accessible to all peoples, regardless of gender, race, ethnicity, age or socio-economic level" [142]. Djukic et al. [30] state that a public place is a place of rest where work stops and where people can chat without any agenda. Artopoulos et al. [9] and Costa and Erjavec [115] state that public and open places offer many benefits including opportunities for relaxation, association and social interaction. They can be used for mobility, as space for walking or biking as well as for recreation. This helps to strengthen the identity of the community and thus strengthen the social fabric. With a variety of different types of public places, a city can meet the needs, preferences and expectations of different people (inclusiveness) [115]. Public places play an important role in the quality of urban life. Urban public places are often referred to as "third places," a term coined in 1970 by the American sociologist Ray Oldenburg [111, 45]. According to Oldenburg, the first place is the private home, the second is the workplace and urban public places are therefore called third places. He explained that

[1] https://smartcity.wien.gv.at/site/ (last accessed on 2020-05-05)
[2] https://www.wien.gv.at/stadtentwicklung/projekte/smartcity/ (last accessed on 2020-05-05)

third places "host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work" [97].

In the following sections, the public places of the City of Vienna are examined. The documents related to this topic and related to the tool *Ermöglichungsflächen* are discussed in detail.

2.3.1 Public Space of the City of Vienna

The "Specialized Concept of Public Space" (German: *Fachkonzept - Öffentlicher Raum*) [72] of the City of Vienna deals with the different aspects, demands and responsibilities of the public spaces in the city. In recent years, increasing pressure to use public space due to a steadily growing number of residents in the City of Vienna has increased the pressure on public space. The public space is a "social space that should be available to all city users, a place of participation and inclusion [72, p. 9]"[3]. The "Specialized Concept of Public Space" [72] deals with urban, multi-functional open spaces that are accessible to everyone at all times and are largely in public control. These places include ground floor zones, parks, shopping centers, railway stations, courtyards, streets and walkways, squares, plazas, market places, parks, green spaces, greenways, community gardens, playgrounds, waterfronts and so on [115, 72].

Vienna's "Specialized Concept for Green and Open Spaces" [169, 155] and "Specialized Concept for Mobility" [133, 157] deal even more closely with green spaces and the traffic function of road space.

2.3.2 Documents of the City of Vienna on Public Space

As mentioned in Chapter 2, the "Specialized Concept of Public Space" is an accompanying document for the STEP 2025. Various studies and publications on urban development have been published on the homepage under www.wien.gv.at/stadtentwicklung/studien[4], and this site has been divided into different subject areas (architecture, public relations, spatial development, urban planning, etc.). Public space belongs to one of these subject areas[5]. The Specialized Concept for Public Space can be found under the category "Strategies and Concepts of Public Space."

2.3.3 Objectives of Public Space

The Specialized Concept for Public Space defines how the public space of the City of Vienna is to be developed [72]. It states that the quality of life in the city should be increased and therefore interaction between the different districts is necessary. In order to meet the demands on public space, five objectives have been developed and additional

[3]Translated from German: "*Sozialraum, der für alle StadtnutzerInnen zur Verfügung stehen soll, ein Ort der Teilhabe und Inklusion*"

[4]https://www.wien.gv.at/stadtentwicklung/studien/index.html (last accessed 2020-07-07)

[5]https://www.wien.gv.at/stadtentwicklung/studien/oeffentlicherraum.html (last accessed 2020-07-07)

indicators have been defined to measure these objectives. The objectives are explained below, and the indicators for the objectives can be found in the document itself.

Lively and Cosmopolitan. Public space fulfills different functions and tasks [72, p. 19]. It is for living, working and visiting people. Furthermore, it enables people to linger, promotes communication and provides additional space for culture and art. Respectful encounters, low-conflict coexistence and the interaction of different cultures is made possible in public space.

Socially Just and Gender Equitable. Public space enables use by all people [72, p. 19]. There is no obligation to consume in order to use public space, and public spaces with quality are accessible throughout the entire urban area. The quality of use and stay is equal for men, women, elderly people, children and caretakers. Public space can be used by everyone without restrictions.

Educating and Activating. The further development of one's own competences is to be promoted by the public space [72, p. 20]. Especially for children and adolescents, public space should be designed to cope with developmental tasks. Active mobility, exercise and walking should be promoted, and users of all ages should be able to move independently in this space.

Ecological and Robust. Public space should meet the high pressure of use and be suitable for everyday use [72, p. 20]. Furthermore, it should contribute to the improvement of microclimates. Natural resources such as soil and water should be treated with care.

Participatory and Identity-building. The design or redesign of the public space must follow clear guidelines and be transparent [72, p. 20]. Neighborhood initiatives are supported in order to involve the population in the design of public space.

2.3.4 The Tool "*Ermöglichungsfläche*"

Ermöglichungsflächen (English: areas of opportunity, enabling areas) represent a new strategy of the City of Vienna to involve the public and encourage the people to participate in co-creation. *Ermöglichungsflächen* enable public spaces in new districts to grow slowly [72, 89]. They are open public spaces that are designed during the planning process of new neighborhoods [72]. In order to strengthen the appropriation and co-design of new streets and squares by the population, the city uses *Ermöglichungsflächen*, which are then developed in dialogue with citizens. Figure 2.2 visualizes an *Ermöglichungsfläche* located at Seestadt Aspern (district Donaustadt in the City of Vienna).

The "Specialized Concept for Public Space" [72] outlines a total of four fields of action. The explanation of each individual measure can be found in the concept itself. The tool *Ermöglichungsflächen* belongs to the field of action "Dialog with Citizen" as Measure 30 (see Specialized Concept for Public Space [72, p. 72-73]).

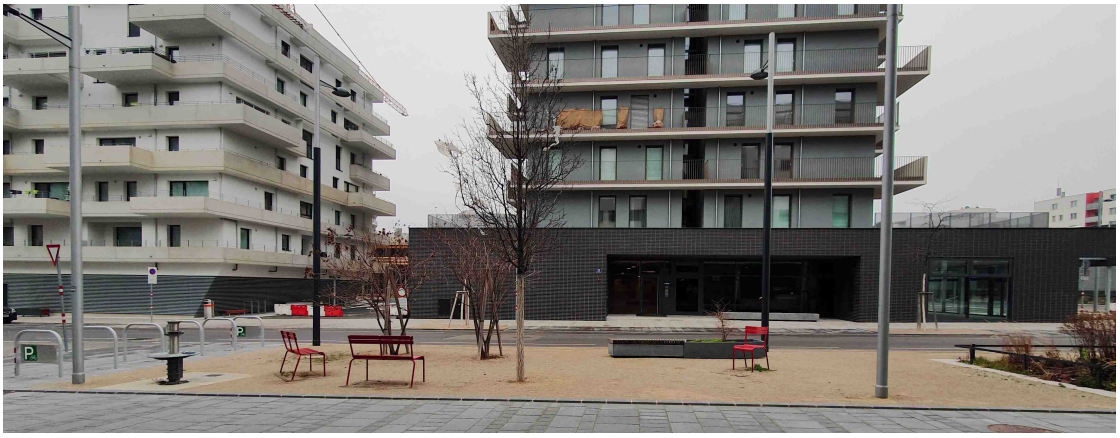


Figure 2.2: Ermöglichungsfläche at Maria-Tusch-Straße 27 at Seestadt Aspern (picture taken on 2020-01-24)

Success Criteria

The City of Vienna has defined various success criteria to ensure the success of the *Ermöglichungsflächen* [72, p. 73]:

- The areas are not planned alone but along with existing developed open spaces.
- Basic equipment and a special ground covering will be used for the areas to ensure that the areas can be easily changed and that they are easily recognizable.
- The financing and design of these areas are clarified in advance and are clear for all parties involved. The City of Vienna suggests various possibilities for financing these areas: *Grätzloase*[6], district budget, private actors, difference between basic and full equipment are discussed.
- A further criterion for success is the communication of the idea of *Ermöglichungsflächen* with the residents. The residents should understand what can be done in these areas. They are to be marked on site, information material is to be distributed and communication via the district representatives is to be guaranteed.
- Professional support (e.g., district management) of the process of appropriation of the areas should be available. This professional support should ensure that all user groups are reached and that fair use of the areas is made possible.
- The approval of projects should be simplified or shortened for *Ermöglichungsflächen* and exceptions for actions in these areas should be defined.

[6] https://www.graetzloase.at/ (last accessed on 2020-07-07)

Development and Accompanying Evaluation of *Ermöglichungsflächen*

In 2017 the landscape office Inspirin[7] began the project Treffpunkt Essling [1]. The project seeks to revive the center of Essling and to increase the quality of experience there. The project is an example of integrated district development. The project tests "how participation in urban development processes can be applied and shared responsibility for urban space can be adopted[8]" [1]. *Ermöglichungsflächen* are used to enliven the public space. Marked zones in Essling's public space are used for increasing the quality of experience.

The use of *Ermöglichungsflächen* has been evaluated, and in December 2018 the report "*Ermöglichungsflächen* in Public Space - Development and Accompanying Research of *Ermöglichungsflächen* in Public Space"[9] [1] was published by Inspirin. In this report *Ermöglichungsflächen* are investigated in two different spatial situations: firstly, in Essling in a mature established urban district and, secondly, in Seestadt Aspern in a young urban development area. Expert interviews and focus groups were conducted for the evaluation. The use of *Ermöglichungsflächen* in Essling, which are called *Möglichkeitszonen*, is discussed in detail and the results of the accompanying evaluation of the *Ermöglichungsflächen* are summarized. The results and Inspirin's summary can be read directly in the report.

The different Names and Locations for *Ermöglichungsflächen*

This new form of participation in public space has different names, varying by location as well as by publication. The names found during the literature review of *Ermöglichungsflächen* are displayed in Table 2.1. The basic concept in the City of Vienna can be found under the name *Ermöglichungsflächen* (mentioned in [86, 35, 72, 89]) and *weiße Flächen* (mentioned in [72, 89]). These public participation areas have been planned and implemented throughout the City of Vienna and can be found not only in the Seestadt Aspern but also in Essling and along the Danube Canal (mentioned in [86, 35]). In addition, further *Ermöglichungsflächen* are planned in the Sonnwendviertel district [1].

Locations and Names: Essling. The *Ermöglichungsflächen* in Essling are called *Möglichkeitszonen* (see Figure 2.3a) and are located at three different locations. These locations are visualized in Figure 2.3b [1].

Names: Seestadt Aspern. As previously mentioned, different names are used for the areas. At Seestadt Aspern, a total of six different names are used. The official documents of the City of Vienna use the name *Ermöglichungsflächen* (see [72], [89, p. 9]) as well as *weiße Flächen* (see [72, p. 72], [89, p. 11]). The Specialized Concept of Public Space [72,

[7] http://www.inspirin.at/ (last accessed on 2020-07-08)

[8] Translated from German: "*wie Beteiligung an Prozessen der Stadtentwicklung angewandt und gemeinsam Verantwortung für Stadtraum übernommen werden kann*"

[9] Translated from German: "*Ermöglichungsflächen im öffentlichen Raum - Entwicklung und Begleitforschung von Ermöglichungsflächen im öffentlichen Raum*"

Table 2.1: Names and locations of Ermöglichungsflächen in the City of Vienna found during literature research

Location	Name(s)
Seestadt Aspern	*Ermöglichungsfläche, weiße Fläche, Gestaltungsfläche, Gestaltungszone, Stadtstrand, Möglichkeitszone*
Essling	*Möglichkeitszone*
Danube Canal	*Ermöglichungsfläche*
Sonnwendviertel district	*Ermöglichungsfläche*

(a) The logo of the Möglichkeitszonen in Essling

(b) The locations of the three Möglichkeitszonen in Essling: 1) Jazzpark (Esslinger Haupstraße 96), 2) space in front of a church (Esslinger Hauptstraße 74), 3) on a meadow next to a playground (Raphael-Donner-Allee-14)

Figure 2.3: Logo and locations of Möglichkeitszonen in Essling [1, p. 18]

p. 72] uses the name *weiße Flächen* and *Ermöglichungsflächen* for the concept itself. The official homepage of Seestadt Aspern[10] and its blog[11] use the terms *Ermöglichungsflächen*, *Möglichkeitszonen* and *Stadtstrand*. After the areas were built in Seestadt Aspern, they were called *Gestaltungsflächen* (mentioned in [1, p. 8]) and *Gestaltungszonen* (mentioned in the blog of Seestadt Aspern). This name was chosen because the residents can design these areas according to their own ideas and wishes. The name should reflect this and give the residents an understanding of how to use them and what they can do with them. In 2019, the district management of Seestadt Aspern[12] conducted a survey, and the name of the *Ermöglichungsflächen* was changed again. The residents were allowed to vote, and in May 2019 the name *Stadtstrand* was chosen (see Blog-Entry [11, 10]).

[10] https://www.aspern-seestadt.at/ (last accessed on 2020-07-07)

[11] https://www.aspern-seestadt.at/lebenswelt/nachbarschaft/meine_seestadt_info (last accessed on 2020-07-07)

[12] https://www.aspern-seestadt.at/ueber_uns/stadtteilmanagement (last accessed on 2020-07-07)

Locations: Seestadt Aspern. The *Ermöglichungsflächen* at Seestadt Aspern are located along the Maria-Tusch-Straße, Sonnenallee and Hannah-Arendt-Platz. This information could not be determined during the literature review and will be discussed in more detail in Section 6.2.2 Locations.

2.3.5 Submissions & Approval of a Project in Public Space

This section discusses the submission and approval process for a project in the City of Vienna. Not every project or activity can be implemented or carried out without approval. Depending on what the project entails and where it is to be implemented, different magistrates need to be contacted in advance. This section explores the *Grätzloase*, an action program of the City of Vienna, furthermore, a tool that facilitates the submission of a parklet proposal to the City of Vienna called CityMaking! *Wien*. Before the details of submission are discussed, parklets are presented.

Parklets

The idea of "parklets" was invented in San Francisco in 2005 [136]. The artists' collective Rebar paid a parking meter, and instead of parking in the space, they invited passers-by to stay and enjoy the time together. This action was followed by many others, and over time, the concept of the parklet has been accepted in cities worldwide. In Vienna, the parklet is a popular form of action [5]. The creation and implementation is supported by *Grätzloase* and CityMaking! *Wien*[13]. A parklet is a part of a parking lane that is transformed temporarily and is always located in front of one's own front door (i.e., every person who wants to create a parklet has to do so directly in front of his or her own door). It is a small park or seating area that is usually built in the inner city area, as green spaces are not easily found there [136]. This type of public space is consumption-free and available to all citizens. This kind of citizen actions is very popular in summer [5]. It invites people to stay and chat, and the residents can arrange the open space according to their own wishes. It creates an opportunity for people to get to know their own *Grätzl* better. There are different forms of parklets, as they can be designed according to the citizens own ideas [136]. Figure 2.4 shows two parklet designs and ideas of the citizens of Vienna from the year 2019.

Grätzloase

The *Grätzloase*[14,15] is an action program of the City of Vienna that lasts from 05.03.2015 to 31.12.2022. It is a program to use the creativity of residents and to design the open space according to their ideas and wishes. Residents of the City of Vienna can submit their ideas to the *Grätzloase* for projects such as designing a parking lot as a *Grätzlgarten* or the street as a fitness room. To help citizens, many guidelines and information sheets

[13] https://citymaking.wien/de/ (last accessed on 2020-05-10)
[14] https://www.wiengestalten.at/graetzloase/ (last accessed on 2020-05-11)
[15] https://smartcity.wien.gv.at/site/graetzloase/ (last accessed on 2020-05-11)

(a) Lebensfragenoase: is a Parklet that invites children and adults to deal with the questions of life. Duration: April - November 2019

(b) Grätzloase Antoni 2019: is a Parklet that invites everyone to sit and linger. Duration: March - October 2019

Figure 2.4: Parklets - Actions of the Grätzloase in 2019 [51]

can be found on their official homepage. Three times a year, a jury chooses the best submissions. Once a project is selected, the residents themselves are responsible for its implementation, including construction, advertising, and so on, but the members of the *Grätzloase* are at the residents' side and provide knowledge to help the project be successful and guidance on what steps need to be completed. If the program is selected by the jury, the residents will be supported with a budget of up to 4000 €.

In cooperation with the MA 28, the *Grätzloase* has prepared a document that is intended to make it easier for residents to submit a project to the City of Vienna [135]. In particular, it specifies what factors must be taken into account, how the parklet has to be secured, what the equipment requirements are and what the situation is with regard to termination and backlogs. Furthermore, the document also indicates where to apply and which magistrate applications should be submitted to. As a matter of principle, an agreement under private law must be applied for every establishment and activity in an urban public space, which is administered by the MA 28. Furthermore, the consent and approval of the MA 19 and MA 46 must be obtained. As a first step, the idea must be presented (plans, sketches, photos, etc.). An application must then be completed and sent to one of the two authorities (MA 28 or MA 46). The application will be reviewed, and the MA 28 will invite the applicant to an on-site interview if necessary. A private law agreement is then sent to the applicant for a permit, and once this is signed and sent to the MA 28, a release for the area is issued.

CityMaking! *Wien*

CityMaking! *Wien*[16,17,18] is a tool for citizen participation in Vienna and has been available since 31.01.2018. CityMaking! *Wien* is a project of the department Smart and

[16] https://cities.ait.ac.at/site/index.php/2018/05/16/citymaking-wien-tools-informal-participation/ (last accessed on 2020-05-11)

[17] https://www.wiengestalten.at/citymakingwien/ (last accessed on 2020-05-11)

[18] https://juan-carlos.info/citymaking-wien/ (last accessed on 2020-05-11)

Resilient Cities of the Austrian Institute of Technology (AIT)[19] [21]. The project is part of a doctoral thesis and aims to help answer the research questions "Does the technology fulfill the promise of facilitating participation and engagement?" and "Can web applications encourage people to become active in their neighborhood?". With the help of four tools, the project supports residents in the design and submission of a parklet. The tools are:

1. The **general info** tool helps find locations where parklets can be installed in the city and where permission will be given for them.
2. The **parklet potential map** tool shows on a map where parklets can be placed. Areas are marked red (parklets not allowed) or green (parklets allowed) to indicate whether it is possible to create a parklet in the existing parking space. After the place for the parklet is identified, the idea can be submitted to the City of Vienna.
3. The **design tool** helps to prepare the drawing for submission. This drawing can be downloaded and then further processed with a program. The tool complies with the requirements and the additional safety regulations for the parklets.
4. The **online submission form** tool helps to establish contact with the responsible magistrates and upload the required documents in order to create the parklet.

The details of submissions through *Grätzloase*, submissions of projects on the *Ermöglichungsflächen* as well as submissions for any public space works are discussed in more detail in Part II Practical Part of this thesis.

[19] https://www.ait.ac.at/ (last accessed on 2020-05-11)

CHAPTER 3

Participation, Co-Creation & Appropriation

"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." – Jane Jacobs [66, p. 238]

3.1 Participation & Co-Creation

In general, the term participation can be understood as involvement in the sense of taking part and participating [85]. Semantically, this can be understood as either an active or as a passive role. On the one hand, people can participate by acting, and on the other hand, they can be given a part. As early as 1969, Sherry Arnstein firmly stated that the integration of people who otherwise have little decision-making power is the cornerstone of democracy [8, 87]. She defined participation as the "categorical term for citizen power." The inclusion of people results in a redistribution of power and is crucial. Only when the people involved are able to exert real influence the integration and redistribution will be successful. Arnstein also indicates that there are different types of participation. If power is not redistributed, then people have no real influence.

3.1.1 Terms & Definitions

The following section provides a brief explanation and differentiation of the individual terms related to active participation in the design, use and management of public space [138], because they are mostly used interchangeably. In "*Praxisbuch der Partizipation*" [7], the City of Vienna distinguishes between the terms citizen participation, public participation and participation (see Figure 3.1).

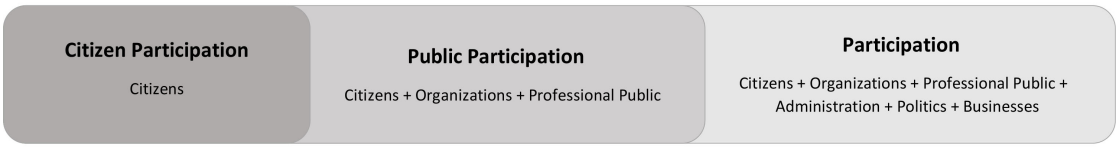


Figure 3.1: Differences between citizen participation, public participation and participation. Author's own representation [7, p. 10]

Citizen Participation. Zimmerman and Rappaport defined citizen participation as "involvement in any organized activity in which the individual participates without pay in order to achieve a common goal" [170, p. 726]. The *Praxisbuch Partizipation* [7] states that it is the opportunity for all affected and/or interested citizens to be represented and contribute their interests and concerns to public projects with the aim of influencing decisions. This includes people who live in Vienna but do not (yet) have Austrian citizenship as well as people who are not (yet) entitled to vote, such as children and young people.

Cooperation. Often used as a synonym for collaboration [73], cooperation also refers to a pro-active group engaged in developing viable solutions.

Collaboration. Collaboration "is the process of two or more people or organizations working together to complete a task or achieve a goal. Collaboration is similar to cooperation. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group" [73, p. 4].

Public Participation. Erjavec and Rukhinskaya define public participation as "two-way communication and collaborative problem solving with the goal of achieving better and more acceptable decisions" [138, p. 210]. In the case of public participation, not only citizens but also organizations such as chambers, bar associations and NGOs as well as the professional public can participate [7].

Participation. As mentioned previously, the term participation can be understood as the involvement in the sense of taking part and participating [85]. In addition to citizens, organizations, the specialist public, administrations, political representatives and companies can also participate [7].

Online Participation. This refers to participation that is supported by the Internet [7].

Co-Creation. The co-creation process "is a special type of collaboration, where people are working or acting jointly with others" [138, p. 210]. It is "a management initiative, or form of economic strategy, that brings different parties together (for instance, a company and a group of customers), in order to jointly produce a mutually valued outcome" [73,

p. 4]. Co-creation "is an act of collective creativity" [138, p. 210] and means to "together (co-) make or produce something (new) to exist (creation)" [73].

Participation vs. Co-Creation. It is important to highlight the difference between co-creation and participation because the two terms have been used in many articles and books, but the difference has not been explained in detail. The important difference between the two terms is that co-creation does not stop at actionable knowledge, but involves the creation of something new [90]. Co-creation requires a practical result, and this requirement does not exist with participation. Participation is often the precondition for co-creation.

3.2 Intensity Levels of Participation

In this section the intensity levels of participation are discussed in more detail. First, participation and the distribution of power are examined using Arnstein's Ladder of Citizen Participation. Afterwards, the three intensity levels of participation in the City of Vienna are discussed.

3.2.1 "Ladder of Citizen Participation"

To explain the different levels of participation in more detail, Arnstein proposed the "Ladder of Citizen Participation" [8]. Figure 3.2 visualizes this ladder, and additional information has been added to better explain the steps. Arnstein divides participation into eight levels and further into three degrees of citizens' power. The eight steps and their names are placed in the middle of the figure. On the right side, the extent of participation and the method of communication between the city and its inhabitants are shown.

Non-participation. The lowest two levels of Arnstein's ladder describe non-participation. Here, the citizens are not really involved in decision-making, but the authorities try to "educate" or "heal" the citizens.

Degree of tokenism. In Levels 3–5, authorities seek to inform the citizens and also give them a voice. However, it is not guaranteed that the citizens are heard. These levels are therefore called "sham participation." In Level 3, citizens are informed about their rights, responsibilities and options. However, communication is one-way, meaning citizens cannot express their opinions. In Level 4, the opinions of citizens are collected; they are allowed to express their opinions, but there is no guarantee that their voices will be heard and taken into account. The citizens have more power in Level 5. They are involved in certain negotiations, but most of the time they cannot get the majority of the votes needed to make change, so it is still considered sham participation or tokenism.

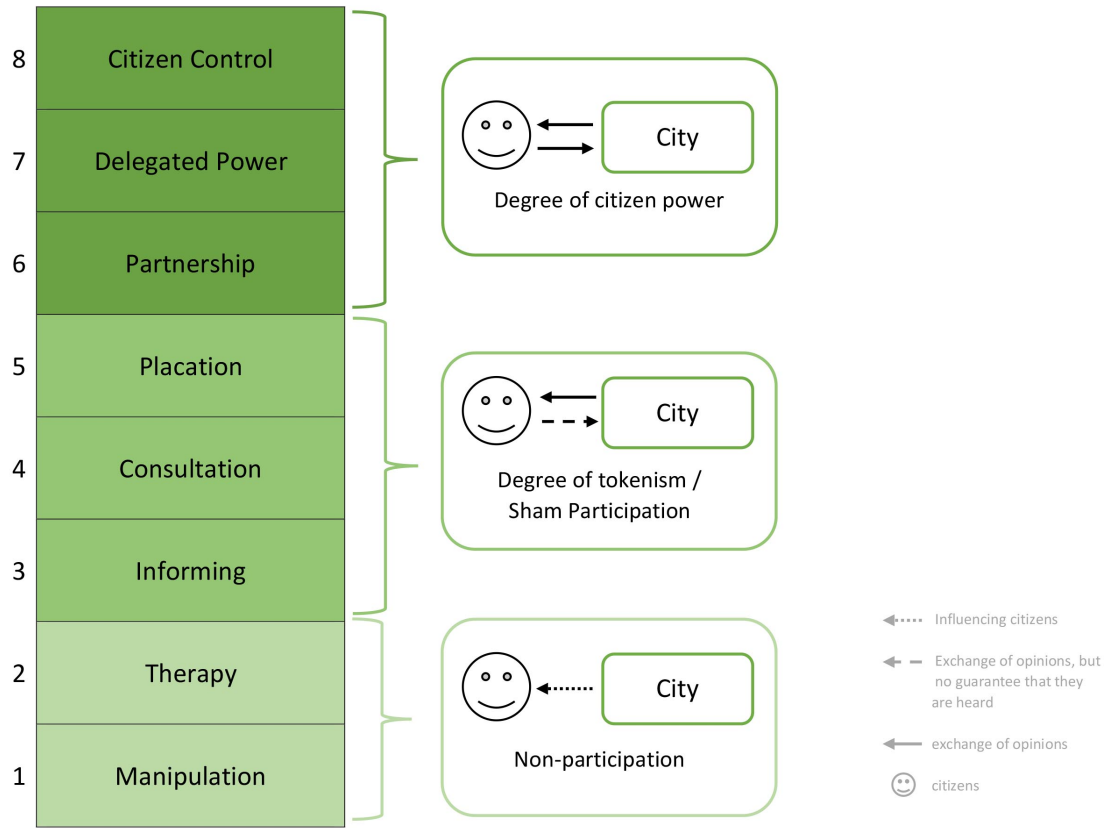


Figure 3.2: Ladder of Citizen Participation. Author's own representation based on Arnstein [8, p. 217] and [87, p. 76]

Degree of citizen power. The top three levels give the citizens more and more decision-making power. When Level 6 is reached, the citizens enter into a partnership with those in power. They can negotiate with them and make compromises. The balance of power is truly changed and the citizens have a voice. In the top two levels, the citizens have the majority of the decision-making seats or full leadership power. At the top level, citizens have the power to direct a program or institution and demand that they be given that level of control or power.

3.2.2 Intensity Levels of Participation in the City of Vienna

A total of three intensity levels can be distinguished for participation in the City of Vienna. These are explained briefly below and visualized in Figure 3.3.

Informative Participation. Informative participation enables citizens to obtain information about a project [7, 61]. Although in many cases they can make suggestions and express concerns, the focus is on the communication of planning projects from the project

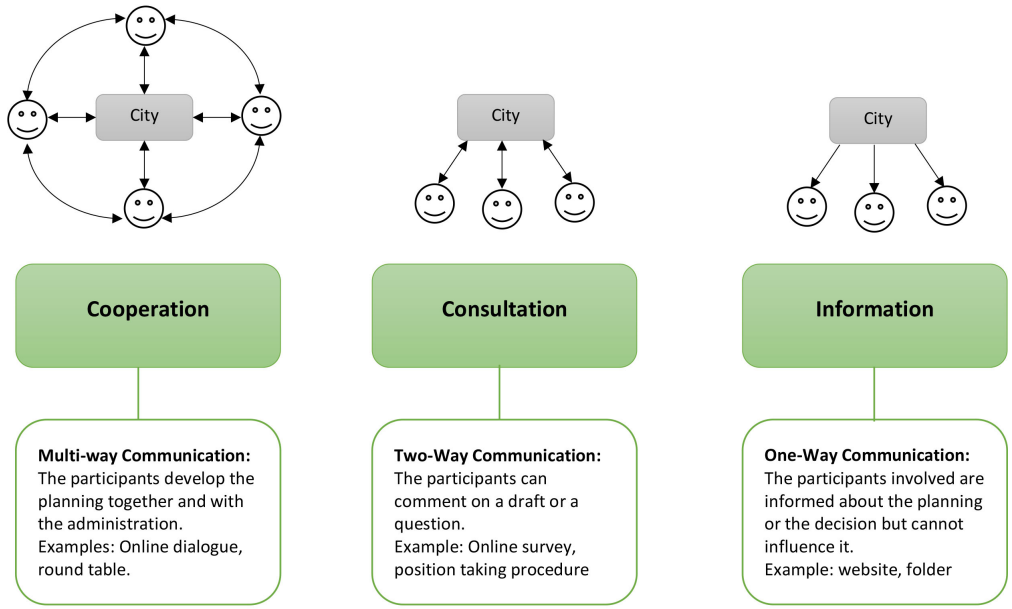


Figure 3.3: Three intensity levels of participation: information, consultation and cooperation. Author's own representation after [7, p. 11]

managers to the citizens. The public cannot voice an opinion and has no influence, so strictly speaking this does not indicate participation. However, participation without information does not work either.

Consultative Participation. Consultative participation means that the parties concerned can comment on a draft or an issue (they can join in or participate) [89, 129]. The opinions of the individuals are in the foreground, but there is no exchange between the individuals involved [7, 61].

Cooperative Participation. In cooperative participation, projects are planned jointly with the administration, external planners and other relevant actors [89, 129]. During cooperative participation, the participants exchange information [7]. In dialogue with each other, they can broaden their perspectives and arrive at new insights and joint solutions. They get to know and understand different needs. In personal discussions, the participants can learn to view the planning with the eyes of the others and develop solutions for the common good that go beyond their own interests.

For the three forms of participation, information is the most common form of participation, followed by consultation – the opportunity to comment. The cooperative development of new solutions together with citizens is less common.

3.3 Participation Opportunities for Citizens of the City of Vienna

In 2019, *Dialog Plus*[1] conducted a short study entitled "Participation and Participation Opportunities in Vienna"[2] [89] for the expert panel *wien.welt.offen*[3]. The results of this study are briefly summarized below. A detailed explanation of the results can be found in the study itself.

The short study provides an overview of current participation opportunities in the City of Vienna for citizens. A total of five categories for participation opportunities were identified (see Figure 3.4): (1) Urban Development Projects, (2) Design of Public Spaces, (3) Child and Youth Participation, (4) Neighborhood Centers and (5) Vienna-wide strategies. These participation possibilities have a top-down character. All current offers can be found on the website www.wiengestalten.at[4]. Some projects were also entered directly into the city map of Vienna[5] and can be found there under "Communication and Economy" and "Participation Projects." Projects concerning urban development can be found directly under https://www.wien.gv.at/stadtentwicklung/projekte/[6]. As in urban development (see Section 2.1), there is an distinction between top-down and bottom-up. The projects that take place at the district- and *Grätzl*-level have a bottom-up character and are initiated and self-organized by the citizens[7].

The following is a brief description of two of the five top-down participation opportunities. The two in more detail discussed topics are necessary to answer the research question and are therefore important for the thesis. For a more detailed information on the other three opportunities we refer to the short study.

3.3.1 Urban Planning Processes / Urban Development Projects

The "Master Plan for a Participatory Urban Development" [129] refers to urban development projects. The master plan attempts to improve communication between the stakeholders involved, such as the municipality, politicians and the population, and also to regulate the methods of communication. The planning status of urban development projects should be communicated with all stakeholders in a timely, transparent and comprehensible manner.

In principle, a distinction is made between formal and informal participation in urban development [89, 129, 62]:

[1] https://dialogplus.at/ (last accessed on 2020-04-30)
[2] Translated from German: *"Partizipation und Teilhabemöglichkeiten in Wien"*
[3] https://www.wienweltoffen.at/ (last accessed on 2020-04-30)
[4] www.wiengestalten.at (last accessed on 2020-04-30)
[5] https://www.wien.gv.at/stadtplan/ (last accessed on 2020-04-30)
[6] https://www.wien.gv.at/stadtentwicklung/projekte/ (last accessed on 2020-04-30)
[7] https://www.wiengestalten.at/landkarte-partizipation/stadtteilgraetzel-bevoelkerungsorientiert/ (last accessed on 2020-05-10)

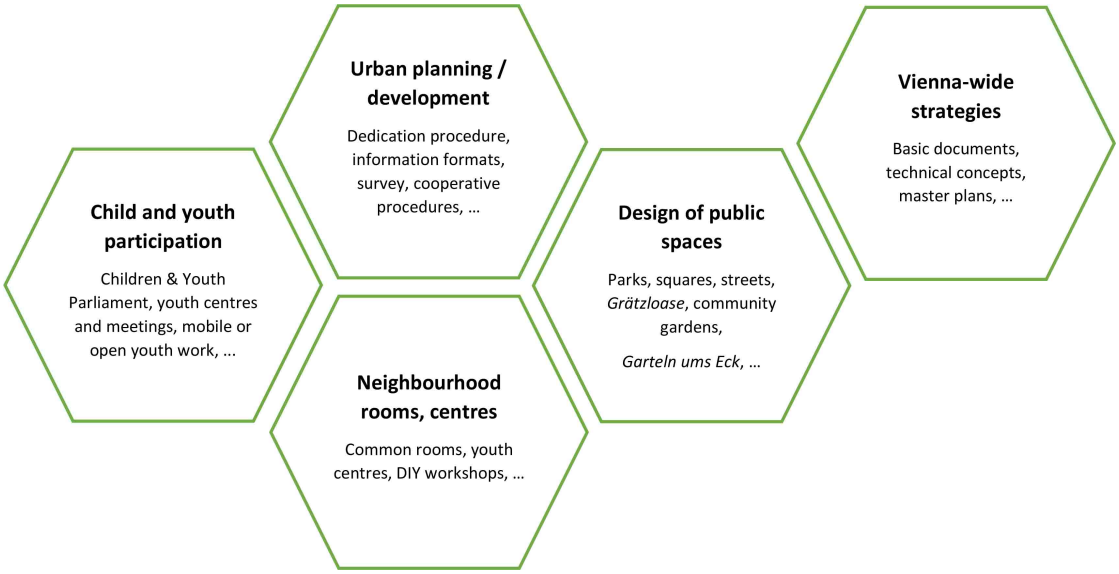


Figure 3.4: The different participation offerings and possibilities for residents of the City of Vienna (top down participation possibilities). Author's own representation after [89, p. 3]

- **Formal:** refers to legally regulated participation in the course of drawing up the zoning and development plan. The Vienna Building Regulations allow citizens to inspect drafts for amendments to the zoning and development plan of the City of Vienna and to submit comments.

- **Informal:** refers to forms of participation that are not legally regulated and therefore freely configurable. This means that informal participation goes beyond regulated participation (formal procedure) [40, p. 27]. The timing, questions, form of communication and the circle of people to be included can be freely arranged in informal procedures. The procedure for informal participation processes is explained in the "Master Plan for Participatory Urban Development" [89, 129]. Informal urban development has in most cases a consultative character, meaning that the public takes on the role of a consultant.

- **Combination of Formal & Informal Participation:** Formal participation (i.e., amendments to the zoning and development plan) can be supported by informal participation formats, such as accompanying information events, exhibitions or delivery of personal information from experts.

MA 21 - Urban District Planning and Land Use[8] is responsible for the planning and development of urban development projects. Land owners, project developers, property developers or building groups develop a participation concept in cooperation with MA21.

[8] https://www.wien.gv.at/kontakte/ma21/index.html (last accessed on 2020-04-30)

Informal participation involves all citizens, regardless of their citizenship or registration address. Formal participation involves all persons, regardless of their origin.

3.3.2 Design of Public Spaces

The design and redesign of public spaces should also be a participatory process [89]. Participation should help to strengthen the individual's involvement in civil society involvement and perception of his or her own living environment. The usability of public space without any compulsion to consume and for all social classes should be guaranteed. The tool *Ermöglichungsflächen* falls under the category of citizen participation and involvement. Community gardens[9], *Garteln ums Eck*[10], *Ermöglichungsflächen* and *Grätzloase* are examples of programs and support mechanisms for participation in public space.

Participation formats for citizens' initiatives are more often cooperative and consultative, but less often purely informative. The chosen participation format for the *Ermöglichungsflächen* in the Seestadt Aspern had a cooperative procedure.

3.4 Participatory Democracy

Erjavec and Ruchinskaya [138] stated that "public spaces are regarded as democratic if they are constituted with forms of participatory democracy, meaning a variety of processes providing people's involvement in decision-making and the rights to participate in society". Neglecting social inclusion can have a negative impact on the success of a public place [19].

Participatory democracy is the third pillar of Austrian democracy [7]. It complements representative democracy (enacted through elections, popular representative assembly) and direct democracy (enacted through popular initiatives, referendums and non-binding (consultative) referendums) but cannot replace them. All three pillars support each other.

3.4.1 Social Inclusion and Exclusion

The concepts of social inclusion and exclusion are context-dependent and multidimensional [3]. It is important to see the big picture. Social inclusion can depend on different factors like age and where people live, so it is important to assess which area is concerned, in other words does it concern the social, economic, political, civic or spatial spheres. It is difficult to generalize because inclusion depends on several factors. To answer the question of when a person is considered excluded is difficult and also depends on the definition of social inclusion [19]. The United Nation (UN) and the United Cities and Local Governments (UCLG) have given the following definitions of both terms:

[9] https://www.garteln-in-wien.at/gemeinschaftsgaerten-und-nachbarschaftsgaerten/ (last accessed on 2020-04-30)

[10] https://www.wiengestalten.at/garteln-ums-eck/ (last accessed on 2020-04-30)

Social Inclusion. The UN defines social inclusion as "the process of improving the terms of participation in society for people who are disadvantaged on the basis of age, sex, disability, race, ethnicity, and economic and migration status. [...] Promoting social inclusion requires both removing barriers to people's participation, including certain laws, policies and institutions as well as discriminatory attitudes and behaviors, and taking active steps to make such participation easier" [3].

Social Exclusion. The UCLG defines social exclusion as "refusing people and/or social groups' access to the resources which, in a specific place and at a specific historical time, are considered socially valuable and necessary for a dignified and autonomous life. Social exclusion hinders people to develop themselves in accordance with their wishes and abilities" [19].

The *Praxisbuch Partizipation* deals with participatory democracy in more detail [7]. It describes how citizens can be involved in projects, the process of these projects and what need to be done to create a project with successful participation.

3.5 Appropriation

The concept of appropriation appears in different contexts. Hüllemann et al. explain that the term appears in social pedagogy, sociology, geography and urban planning. Furthermore, they indicate that the term itself has several dimensions of meaning [59, 32]. Appropriation refers to taking possession, and this act can be legal (acquisition of property, takeover) or illegal (theft, annexation). Additionally, the term can refer to a learning process in the sense of the acquisition of new knowledge and skills. An interdisciplinary definition of the concept of appropriation as a technical term could not be found by Hüllemann et al. [59].

The process of appropriation is an active process, and according to Bader this means "that the social conditions, meanings, competences etc. are not automatically internalized and absorbed, but individually worked on and processed" [12]. People must actively deal with their environment, and this means an appropriation of the material and symbolic culture [59, 109].

3.5.1 Appropriation of Space

For Chombart de Lauwe, the appropriation of space "is the result of the possibility to move freely in space, to relax, to be able to own it, to feel something, to admire, to dream, to get to know something, to be able to do and produce something according to one's own wishes, demands, expectations and concrete ideas" [18]. Acquiring a space happens exclusively within the framework of society, occurring in groups, social milieus and in relationships with other people. The act of appropriation requires one to get involved in conflicts or to find agreement with other people. For Jaeggi, the idea of appropriation "is an interesting tension between the given and the formable, between adoption and

creation, between sovereignty and dependence of the subject" [67]. Appropriation is not an individual and isolated act, but is the cumulative result of many psychological processes [18].

3.6 Related Work & Organizations: Participation, Co-Creation, Appropriation

This section reviews different organizations and projects dealing with the topics of participation, co-creation and appropriation. Projects in the City of Vienna are discussed as well as the worldwide projects that formed the basis for the development of a technical solution for the *Ermöglichungsflächen* of the city and for answering the research questions.

3.6.1 *Wien gestalten - Beteiligung in Wien*

Wien gestalten - Beteiligung in Wien[11] (English Designing/Shaping Vienna - Participation in Vienna) is a project from *Dialog Plus* that was developed in 2012 during the preparation of the *Praxisbuch Partizipation* [49]. It is an online platform that provides an overview of all current and completed public participation projects of the City of Vienna, including all top-down and bottom-up participation projects. The projects can be searched by topic, district or method using the knowledge database[12]. Alternatively, the interactive map can be used to search for current and past projects. When a participation possibility is selected on the start page of the platform, a map of the different projects is displayed.

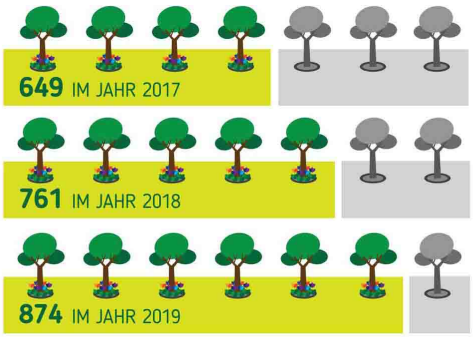
3.6.2 *Garteln ums Eck*

Garteln ums Eck[13] is a bottom-up participation project that has been running since 01.01.2011 [48, 161]. This project aims to help the city become a little greener. The soil around a tree or small open space can be greened by contacting the *Gebietsbetreuungen Stadterneuerung (GB*)* [150]. The project is carried out in cooperation with the Vienna City Gardens (MA 42). The number of citizens who take care of an area around a tree has risen steadily in recent years (see Figure 3.5a). Figure 3.5b shows an arrangement of a small garden around a tree.

3.6.3 *#kommraus - Forum Öffentlicher Raum*

The project *#kommraus - Forum öffentlicher Raum*[14,15] took place from 16.05 to 18.05 in 2019 and was a top-down participation project [47]. It offered opportunities to meet people on the streets and squares of public space and to discover, exchange and participate

[11] https://www.wiengestalten.at/ (last accessed on 2020-05-11)
[12] https://www.wiengestalten.at/projektsuche/ (last accessed on 2020-05-11)
[13] https://www.gbstern.at/themen-projekte/urbanes-garteln/garteln-ums-eck/ (last accessed on 2020-05-11)
[14] https://www.kommraus.wien/ (last accessed on 2020-05-11)
[15] https://www.facebook.com/kommraus.wien (last accessed on 2020-05-11)



(a) The number of registered small gardens around a tree in the years 2017-2019

(b) Example: Garteln ums Eck

Figure 3.5: Garteln ums Eck [2]

in shaping those spaces [4]. The citizens of the City of Vienna were to develop new perspectives together. The forum offered the opportunity to network with institutions and other actors.

3.6.4 *Wien wird WOW*

Wien wird WOW[16] is a Vienna-wide participation project that runs from 18.04.2018 - 31.05.2020 [50]. Vienna's urban planning department is constantly working on new projects [152, 14]. Many residents only learn about a new plan when it is already being implemented, at which point they can no longer intervene, and thus residents feel poorly informed. *Wien wird WOW* addresses this problem.

The interactive WOW-Exhibition

This interactive exhibition about urban planning brings information about current projects directly to the people [152, 14]. Residents can thereby inform themselves about current development and contribute ideas and suggestions. The station is built out of wood and is approximately five meters high, although it can adapt in height and width to the respective tour location and will grow over the years (see Figure 3.6) [152]. The exhibition consists of eight chapters and four interactive games and is managed by teams of experts.

WOW - *Mach Mit!*

There is also the possibility for residents to create a "WOW-Posting" [166]. A WOW-posting is a recommendation for public improvements in the City of Vienna that any individual can submit through an online platform. There are three different posting types (1) "Favoriten (the 10th district) must be _____", (2) "My Grätzl needs more _____"

[16] https://wienwirdwow.at/ (last accessed on 2020-05-11)

Figure 3.6: WOW station at Nordbahnhof [165]

(3) "Vienna will _____" and three different fonts to choose between. The submitter then writes a short text and posts it publicly. This way they can communicate their opinion to the City of Vienna about a certain topic (see Figure 3.7).

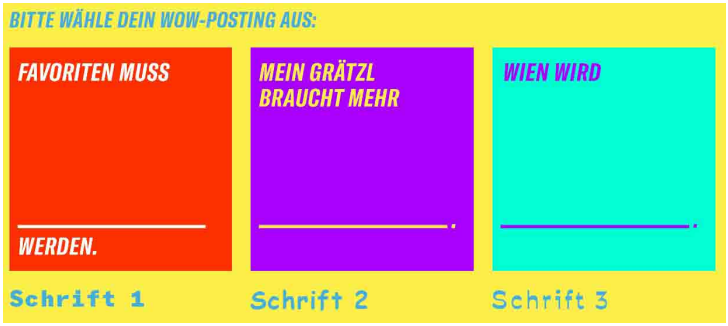


Figure 3.7: Wien wird WOW-Postings [166]

3.6.5 DIPAS - *Digitales Partizipationssystem*

DIPAS[17] is a digital citizen participation GIS-based integrated system of the city of Hamburg [116, 74]. Citizens can access digital maps, aerial photographs, plans, 3D models and geodata from their personal homes, from their personal mobile devices, or at events. They can thus provide localized feedback on planning projects. The topics in which citizen participation takes place can be freely chosen, meaning the system is "open to topics". The project duration of DIPAS is from September 2017 to December 2020.

[17] https://www.hamburg.de/dipas/ (last accessed on 2020-05-10)

3.6.6 Smarticipate

Smarticipate[18] is an EU funded project (Programme: HORIZON 2020) that was developed from 01.02.2016 to 31.01.2019 [55]. It is a data-based citizen dialogue system and a platform that enables citizens to access and understand the city's data [118, 139]. Through this project citizens are involved in the decision-making process and the city itself gains insight into the wishes and ideas of its residents. In this way, the citizens take an active role in the planning of the city. With the help of the platform, bottom-up processes become a part of urban development and residents are encouraged to co-create [139]. The cities where the platform was tested were Hamburg, Rome and Kensington and Chelsea (the Royal Borough of Kensington and Chelsea) [60, 140]. The project was coordinated by the Frauenhofer Institute and supported by the following institutions: University of the West of England, the AIT, GeoVille Information Systems and Data Processing, ICLEI European Secretariat, wetransform GmbH, and We Love the City.

The available data of the city (i.e., open data), as well as data published by other stakeholders, form the basis for the platform [139]. Three different platforms were implemented and tested in the three cities [120].

Plant a Tree

Hamburg's goal is to reduce CO2 emissions by 40% by 2020 and by 80% by 2080 [119, 120]. To help achieve this goal, the Plant A Tree platform/app was tested in the city of Hamburg (see Figure 3.8a). Citizens were able to choose a location to plant a tree and receive immediate feedback as to whether it would be possible at that location. They also received additional information such as CO2 reduction and cost breakdown.

Urban Gardening

The city of Rome tested an urban gardening platform [120]. The residents and the community were to decide where a new urban garden would be created in the neighborhood. With the help of the platform, they could determine a possible location and whether a water source existed nearby (see Figure 3.8b).

3D Planning

With the third prototype, residents could insert a new building in a 2D and 3D plan [120]. They received immediate feedback and could more easily understand the advantages and disadvantages of the building proposal (see Figure 3.8c). Residents could rate the uploaded ideas and also share them on social media. This prototype was tested in the Royal Borough of Kensington and Chelsea.

Smarticipate can also be used by cities or interested stakeholders [120]. Anyone can create their own version and thus collect the opinions of citizens. Currently (checked on

[18] https://www.smarticipate.eu/ (last accessed on 2020-05-10)

(a) Plant a Tree App

(b) Urban Gardening App

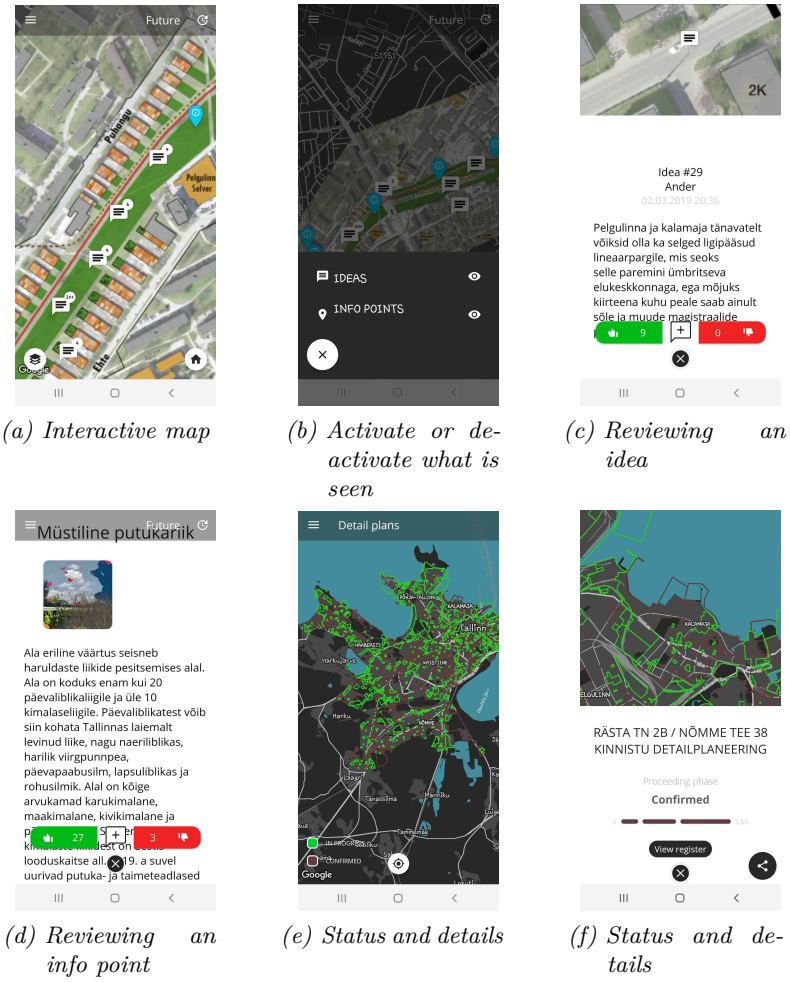
(c) 3D Planning App

Figure 3.8: Smarticipate: the three prototypes [120, p. 9]

2020-05-12), the City of Vienna has two active Smarticipate projects on the platform: "We are collecting new Smarticipate topics for the 15th District of Vienna" and "Urban Gardening in Vienna" (see [117]).

3.6.7 AvaLinn

The app AvaLinn was designed to provide all stakeholders an easy way to give feedback on different developments [92], which should help motivate stakeholders to participate in co-creation. AvaLinn means open city, and the app was developed by the City of Tallinn, the capital of Estonia. It was released in January 2018 and ran until September 2018. The app allowed stakeholders to contribute their own ideas (Ideas) and provide feedback on plans made by the municipality (Info Points). The app displayed the Info Points as well as all the Ideas on an interactive map (see Figure 3.9a), and it could be used on Android and iOS devices. Users could choose if they want to activate or deactivate the Ideas or Info Points (see Figure 3.9b). The stakeholder ideas (see Figure 3.9c) and the plans made by the municipality (see Figure 3.9c) could be evaluated by the users. In addition, the planning status of projects was displayed to users (see Figure 3.9e and 3.9f).



(a) Interactive map *(b) Activate or deactivate what is seen* *(c) Reviewing an idea*

(d) Reviewing an info point *(e) Status and details* *(f) Status and details*

Figure 3.9: Screenshots of the app AvaLinn. Created by the Author on 2020-03-12.

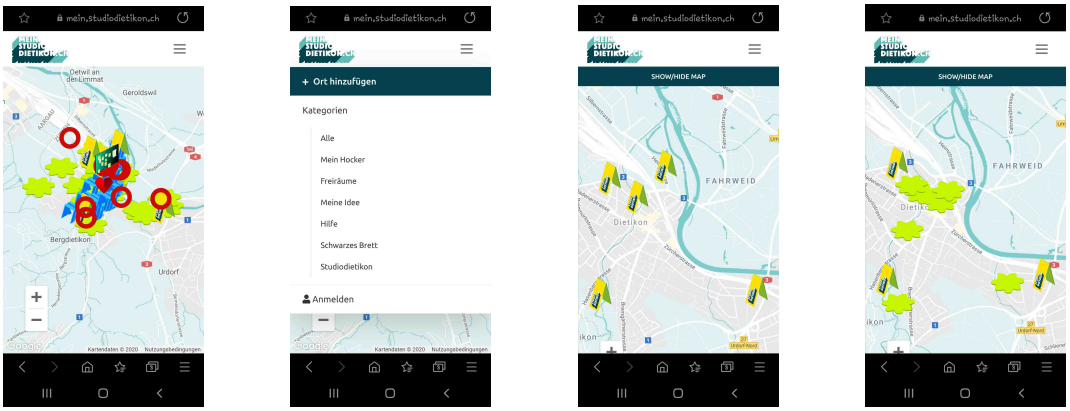
3.6.8 Studio Dietikon – *Dialog Stadtentwicklung*

The city of Dietikon (Switzerland) has published a project called "Dialogue Urban Development"[19] to explain the urban development processes to the population [28]. The goal of this project is to help the population understand the measures, support them and express their opinion on projects in a participatory manner. There should be an active exchange between the inhabitants, politicians, administration and experts. In 2020, Studio Dietikon will focus on open spaces, and residents will be invited to contribute their ideas.

In March 2020 City of Dietikon published the digital free space platform my.studiodietikon.ch [29]. This platform allows users to enter their favorite places and their ideas for open space and urban development into an interactive map (see Figure 3.10a). Inhabitants/users are

[19]Translated from German: *Dialog Stadtentwicklung*

asked to enter their wishes on the map and thus find "accomplices" for their ideas and exchange ideas with each other. Users can choose which categories out of six options are displayed on the map (see Figure 3.10b). Figure 3.10c visualizes the category "Studio Dietikon" and Figure 3.10d visualizes the category "Open Space."



(a) Interactive map *(b) Choose one of the topics* *(c) Example category: Studio Dietikon* *(d) Example category: Freiraum*

Figure 3.10: Screenshots of the platform my.studiodietikon.ch. Created by the Author on 2020-07-13.

CHAPTER 4

People, Place & Technology

This chapter addresses the connection between people, place and technology. The first section deals with placemaking – the connection between people and place. It examines what placemaking is and the difference between space and place. Furthermore, the 11 principles of placemaking, the placemaking process and the difference between a successful and unsuccessful place are examined. The second part of this chapter deals with urban informatics – the connection between people, place and technology. The definition of urban informatics as well as different ethnographic approaches in this context are discussed.

4.1 Placemaking

In the 1960s, Jane Jacobs[1] and William H. Whyte[2] proposed the idea that cities should be designed for people and not just for cars [6]. They argued that creating an inviting public space is important for the inhabitants of a neighborhood. In designing public space, it is essential to examine the place, listen to the people who live, play or work there and ask questions to find out what they want and need. This information can then be used to "create a common vision for that place" and guide the design of public areas such as streets, sidewalks, and parks in order to promote human interaction and create communities that "are more socially, physically, and economically viable" [88, 106]. The City of Newcastle in New South Wales, Australia defines placemaking as "the active participation of community stakeholders in the planning and management of public places to achieve safe, vibrant and welcoming places and long-term community benefit" [25]. Project for Public Spaces (PPS)[3] states that through placemaking all "public spaces should become places" [95]. PPS "is a nonprofit planning, design, and

[1] https://www.pps.org/article/jjacobs-2 (last accessed on 2020-04-21)
[2] https://www.pps.org/article/wwhyte (last accessed on 2020-04-21)
[3] https://www.pps.org/ (last accessed on 2020-07-12)

educational organization dedicated to helping people create and sustain public spaces that build stronger communities". The organization was founded in 1975 and builds on the insights of William H. Whyte and his book "Street Life Project." The nonprofit addresses the topic of people and public places. The group has tried to capture their years of experience by writing helpful documents and guidelines for researchers dealing with connection of people and places as well as placemaking. Since 1975, they help people create and sustain public space and thereby create strong community [103]. PPS has been working in this realm since 1975, has defined a placemaking approach, and since 1990, has been using the term placemaking in its work and projects to draw attention to the topic as well as the term itself. For PPS "placemaking is both an overarching idea and a hands-on tool for improving a neighborhood, city or region. It has the potential to be one of the most transformative ideas of this century" [106, p. 1].

In 2007, the Boston Society of Architects (BSA) Placemaking Network[4] created a "Placemaking Manifesto" [82]. They defined what placemaking is and means to them. For them, placemaking involves the points summarized below:

- **Quality of Life:** The public realm is a common good that is brought to life through the design of citizens, their relationship to these places as well as active programmes in which people seek to improve the quality of life.
- **A Sense of Place:** Placemaking is important to create identity. To ensure that a sense of place is developed, it is important to recognize that the feeling in a place, the emotions it elicits and the experiences it fosters are critical to fostering a sense of place.
- **Caring About the Community:** Placemaking benefits neighbours, community and even culture. By involving people in the design and use of public places, a community identification can be created. Public events, public art and active programming are very important in this context.
- **Collaboration and Communication:** An interdisciplinary approach is essential. Different disciplines such as architecture, urban design, landscape architecture, public art and community cultural programming must collaborate and communicate with each other. The different disciplines should not create isolated projects.
- **Active Participation:** When designing public space, the focus should not be on the individual but on society. Everybody should participate and nobody should be excluded. Inclusivity should be in the foreground.
- **Tradition and Innovation:** Awareness of tradition and the inclusion of new and emerging technologies are combined through placemaking. The existing rules of form and space are respected, but new innovations are also used to promote community building.

[4] https://www.architects.org/knowledge-communities/placemaking-network (last accessed on 2020-04-21)

4.1.1 Terms and Definition of Placemaking

In the literature different spellings are used for the term placemaking like “Placemaking”, “place-making” and “place making” [112]. In the following, the spelling placemaking is used because it is the most common. The different spellings do not express different meanings. There is no uniform translation of the term placemaking into German, and the term itself is used in English and German literature. There is no universal definition for the term in either in English or German.

4.1.2 Space vs. Place

In this section we will take a closer look at the terms “space” and “place”. To understand what it means when PPS states that “public spaces should become places”, the difference between the two terms must be clear. In the literature often no distinction is made between these two terms, but the distinction is essential for this thesis.

> “A space is a physical description of a piece of land, whereas a ‘place’ connotes an emotional attachment to the piece of land.” – PPS [106]

Space. In basic principle, space can be regarded as an open and accessible area that can be accessed by the entire community and exists without a profit motive [95]. A space can be described as a location and is an abstract concept. If we get to know the space better and give it value, then it becomes a place. Thus, a space is a location that has not yet been given value [46, 141].

Place. Tuan [141] stated that in contrast to a space, “places are centers of felt value where biological needs, such as those for food, water, rest, and procreation, are satisfied”. A place is created by the phenomena of direct experience [76]. All experiences made there make up a place. Places are the origin of identity for people around the world. Experiencing, creating and maintaining each place is therefore essential. “A place has its own history - a unique cultural and social identity that is defined by the way it is used and the people who use it” [95].

4.2 11 Principles of Placemaking

The team at PPS have been working for over 40 years to revitalize community with their placemaking approach [103]. They have developed “11 Principles of Placemaking”, which provide a guideline for communities to “(1) Integrate diverse opinions into a cohesive vision, (2) translate that vision into a plan and program of uses, and (3) ensure the sustainable implementation of the plan” [103, Section “Key Principles of Placemaking”].

This guideline and other tools are used to create places of value. The successful design of healthy public spaces is very difficult [93, 106], which is why PPS defined guiding principles to help turn public space into successful community place. In 1999, PPS wrote

the book "How to Turn a Place Around" which explains their principles in detail, as summarized below [105].

1. **The Community is the Expert**
   In the beginning, the community should serve as a starting point to learn about the place. Community members know what the local problems are and what is important for them and the area, and they understand historical background, how the environment works and what is done there. If they are consulted at the beginning of the project, it helps to create a sense of community ownership.

2. **Create a Place, Not a Design**
   A valuable place consists of more than its design. It is important to create an inviting and comfortable place for people with the help of physical elements. But more importantly, a "strong sense of community and a comfortable image" has to be created by granting access and creating active uses and economic opportunities.

3. **Look for Partners**
   Partners are invaluable in the design and successful implementation of a space. They can help to develop or brainstorm different scenarios. They can also provide innovative ideas and financial or political support. Partners can be local institutions, museums, schools and others.

4. **You Can See a Lot Just By Observing**
   A great deal can be learned through observation. One can orientate oneself by the successes and failures of others. Observation can reveal how people use the place, what they do there, what is missing and what works well or not well. This is important both before building a space and also afterwards, as more can be learned and further developed.

5. **Have a Vision**
   The idea for designing a space must come from the community itself. It is necessary to define which activities should be done in the space, and the space should be comfortable and invite people to be there.

6. **Start with the Petunias: Lighter, Quicker, Cheaper**
   Lighter, Quicker, Cheaper: The entire space cannot be perfect from the beginning. It is enough to make small experiments or improvements at the beginning. These remain for a short time and can be improved over the years. Public art, seating, outdoor cafes, community gardens are examples of improvements that are available for a short time and can be tested. This topic is discussed in more detail on the page "The Lighter, Quicker, Cheaper Transformation of Public Spaces" [99].

7. **Triangulate**
   Whyte [149] defines triangulation as "the process by which some external stimulus provides a linkage between people and prompts strangers to talk to other strangers

as if they knew each other". The placement of the physical elements in a public space is of great importance [93, 106] because it can trigger the triangulation process or not. When arranging the elements, a connection should be established between them. If they are placed without connection, they are likely to be hardly used. If they are arranged together, the triangulation process can be triggered.

8. **They Always Say "It Can't Be Done"**
   Problems are often encountered in the design of public spaces. This is because the public and private sector often do not take responsibility for designing a great place. Often, the task has not been done yet, and therefore, some say "it can't be done". One should start with small community nurturing improvements to show the importance of places and minimize problems.

9. **Form Supports Function**
   In order to maintain the "form" of the vision of the future place, more needs to be done than just design it. Asking for the input of the community and partners, understanding the function of the place and experimenting are very important.

10. **Money Is Not the Issue**
    If the partners and the community are involved, the costs can be reduced. With the basic infrastructure in place, it is not expensive to add additional elements like seating and flowers. The design of a place should be well planned and involve all stakeholders, and if this is done, the costs incurred will be worth it.

11. **You Are Never Finished**
    Society and the needs of people change over time. These changes must be planned, considered and easily implemented to ensure that the place is and remains highly valuable.

4.3 The Placemaking Process

The preceding sections explored what placemaking is, what the difference between space and place is and what needs to be considered when creating a valued public place [101]. Now the question arises, how is placemaking done? Over the years, PPS has managed and executed many projects and developed a five-step placemaking approach. The steps are not always performed in the same order, but they should accomplish the basic procedure. This approach can be applied to long-established as well as newly developing places.

PPS defines its approach as a "Place-Led, Community-Based Process" [96]. In earlier times, project-driven development was used for the development of a public space and is top-down. With this type of project, the primary goals are that the budget is adhered to and the project is completed on time. The wishes and needs of the inhabitants are not taken into account, but a strict plan is followed. However, in modern times the approach is shifting towards place-led development. This development type benefits the community. A place-led process turns proximity into purpose [143, 96]. Not only are the opinions of

various stakeholders sought, but they are also included in the planning process. Group activities, the planning process and administration are used to build a sense of place.

4.3.1 The Five Steps

Figure 4.1 visualizes the steps of the placemaking process.

(1) Define Place & Identify Stakeholders. At the beginning of the process a place is chosen, and the interested stakeholders are identified. Stakeholders include the community from public, private and civic sectors. This is the only way to ensure that all wishes are taken into account and identify the main issues.

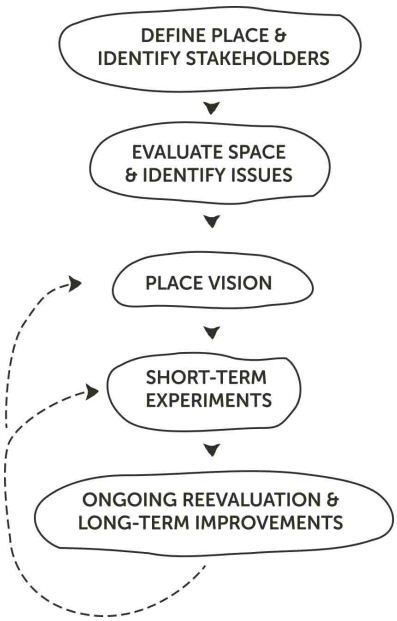


Figure 4.1: The placemaking process created by Project for Public Space (PPS). This process consists of five different steps [101]

(2) Evaluate Space & Identify Issues. The second step is to evaluate the space by assessing how it is used and what can be improved. PPS uses a Placemaking Workshop for this phase which includes the "Place Performance Evaluation Game" (for further information see [100]) and which can be used with diverse groups ranging from children up to trained professionals.

(3) Place Vision. The results of Step 2 are used to create a Place Vision or Place Vision document.

(4) Short-Term Experiments. Spaces do not have to become successful overnight. PPS states that it makes sense to let a space grow incrementally and to develop and

evaluate "Lighter, Quicker, Cheaper (LQC)" (for further information see [99]) projects at the beginning.

(5) Ongoing Reevaluation & Long-Term Improvements. The design of a space is never complete or finished. Although LQC projects can deliver intermediate results, they cannot independently complete the design. Stakeholders should remain involved and ongoing changes (both short- and long-term) should be made to the space. The vision for the place should repeatedly be revisited, and the process should start again at Step 3.

4.4 Successful vs. Unsuccessful Places

In this section we explore the design of a place. We therefore deal with the question of what factors make a place successful and what characteristics it must have in order for people to feel comfortable. In order for people to use a place, these questions must first be examined closely.

4.4.1 What Makes a Place Successful?

To convert public spaces into successful places, personal meaning must be created for the place [110]. According to Garagnani et al. [42], different communities create personal meaning in different contexts. In creating a public place, the different communities involved should be identified and encouraged to take ownership of the creation process [33]. The meaning and context that a place receives when different communities feel ownership is also called intangible value or "spirit of place". With the help of intangible and tangible (physical) elements, a community's sense of belonging and cultural connection can be created [43].

Places are meant to enable social and economic exchange and should comfortably allow the possibility to meet friends and to discover and observe different cultures [106, 88]. A public place can be considered the "front porch" of public institutions. Only when "spaces become more than a sum of its parts, it becomes a place" [106, 88]. A place should allow and enable several activities. For example, in a park there should be a fountain and a playground. This park should provide the opportunity for parents to watch their children play or talk to other parents. It should also be possible to consume and buy drinks and food. The first step is to evaluate the physical characteristics of the space and ensure everything necessary is available, but this alone is not enough (also see #PlacesIDontWantToSit[5,6] [7] [69], [98] and [53]).

The people at PPS have spent years researching what makes a successful place and exploring the difference between successful and unsuccessful places [104, 106, 44]. Jan

[5] https://www.facebook.com/search/top/?q=%23placesIdontwanttosit (last accessed on 2020-04-22)
[6] https://twitter.com/search?vertical=default&q=%23PlacesIdontwanttosit&src=typd (last accessed on 2020-04-22)
[7] https://www.instagram.com/explore/tags/placesidontwanttosit/ (last accessed on 2020-04-22)

Gehl[8] and PPS have identified four characteristics that can help guarantee the success of a place: a place has to be accessible, be comfortable, be sociable and attract people to carry out activities there. Over the years, PPS has documented the key attributes of places, including intangibles, as well as methods for measuring them and developed "Place Diagram" which is visualized in Figure 4.2. They have also defined questions for each of the key attributes, which can be found on their homepage (see "What Makes a Successful Place?" [104]).

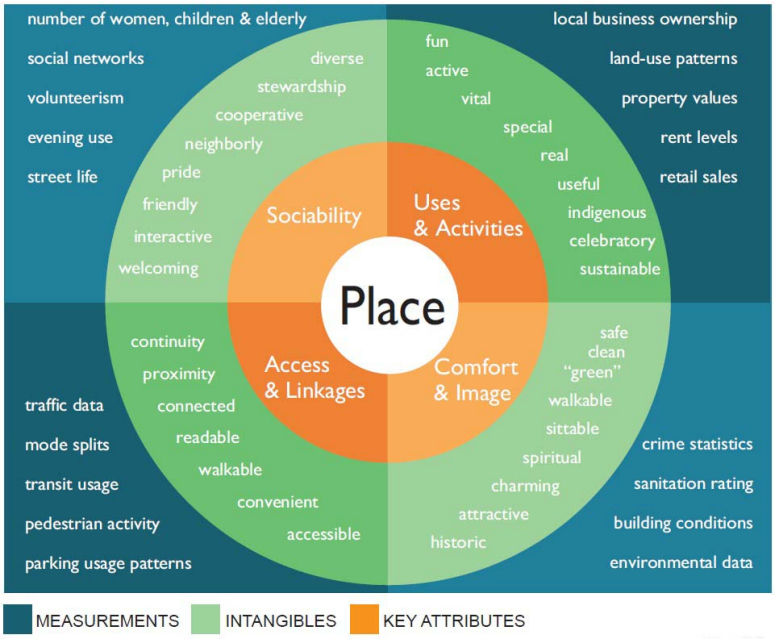


Figure 4.2: The Place diagram helps evaluate whether a place is successful or not [106].

Access & Linkages

Accessibility & Linkage can be measured by assessing how connected a place is to the existing environment and surroundings [104, 106]. It should be easily accessible, it must be visible (from near and far) and it must be easy to cross. The adjacent buildings or areas are also important. It is more pleasant to be next to shops than a white wall or an empty lot.

Comfort & Image

A place must have a pleasing external appearance [104, 106, 44]. It must be inviting and comfortable. One very important factor in this context is the choice of seating. People must be able to choose where they want to sit. A public square should be perceived as

[8] https://www.pps.org/article/jgehl (last accessed on 2020-04-21)

an "extension of one's home" [94]. If people can physically and mentally engage with a place and find it pleasant, then this place can also become a third place.

Uses & Activities

If a place is empty and unused, it is a sign that something needs to be changed [104, 106]. A place should allow people to engage in activity. Well thought-out and enjoyable activities are the reason people return to a place and use it. In "Life Between Buildings" Jan Gehl states that the physical environment has an influence on people's activities [44]. He divides activities in public space into three categories: necessary, optional and social activities. In order to design a successful place, it is necessary to consider how people perceive the public space while carrying out an activity [44, 6]. The three categories of activities are discussed in more detail below.

1. **Necessary activities:** These are activities that are a necessary part of people's lives (e.g., shopping, going to school or work, etc.). They are the tasks of daily life that satisfy basic needs. Since these activities are a necessity, they are minimally influenced by the external environment.
2. **Optional activities:** These are activities that are only performed when there is the desire. For example, people can choose if they would like to go for a walk or sunbathe. These activities only happen when the exterior conditions are favourable (i.e., when the weather is suitable). In this kind of activity the exterior appearance, or the design of the public space, as well as the current weather conditions are of great importance.
3. **Social activities:** These are activities that involve or require the presence of other people in a public space, for example play dates of children, conversations and passive contacts (i.e., hearing and seeing other people). This is the most common type of activity and results from the first two activities, for which reason Gehl termed them "resultant activities".

Sociability

Sociability is very difficult to achieve, but for a successful place, this is an indispensable quality. People should have the possibility to meet with their friends or neighbours or to talk to strangers. If a place makes this possible, people feel more a part of the place and the community.

4.4.2 The Power of 10+

It is not enough to have a single good place in a neighborhood. To create a city worth living in, several good places are necessary, and placemaking should be applied at different levels of urban development [102, 106]. Therefore, PPS has developed the tool "the Power of 10+" to apply placemaking on all levels. In summary, people need 10+ reasons to

visit a place. This means that cities and regions must offer 10+ destinations or districts for the visitor or resident, destinations must offer 10+ places and places must offer 10+ things to do. Often the last level — the place level — is forgotten.

4.5 Related Work & Organizations: Placemaking

This section explores different organizations and projects dealing with the topic of placemaking. Projects and organizations of the city in Vienna are covered as well as worldwide projects that formed the basis for the development of a technical solution for the *Ermöglichungsflächen* of the City of Vienna and for answering the research questions.

4.5.1 Space and Place - *Kulturelle Raumgestaltung*

Space and Place - *Kulturelle Raumgestaltung*[9] - is a non-profit group that works in the City of Vienna. The members walk, research, plant, communicate, design and seek "to motivate people to exchange light-hearted and entertaining ideas - in places that at first glance are inconspicuous"[10] [123]. They aim to create new connections throughout Vienna through social interventions and use different elements to encourage people to interact with each other. Over the years the group has managed and initiated various projects.

Wien lebt is a project of Space and Place [124] in which public space is viewed as a public living room. This series of projects seeks to examine living and working together in the City of Vienna in order to discover the city's potential. With this project the group works to create social spaces out of urban places and thus offer people the opportunity to get to know each other and to exchange ideas. They network with local initiatives and thus ensure the continued existence of successful activities. Every year they dedicate themselves to a new topic. Their projects concerning *Wien lebt* can be found directly on their homepage http://spaceandplace.at/wl/[11].

In their project *Wohnstrasse lebt*, Space and Place aims to find out what Vienna's residential streets are all about, or in other words, what they were created for and to what extent they are actually used by people as living space [125]. In cooperation with the city workers and residents, they organize tests. These tests are designed to find out if the residential streets are "suitable for living rooms," which furniture is practical, what is needed to feel good, and which games are suitable for the space. Through this project, they want to get the residents out onto the streets and encourage them to take ownership of this open space. Residents can test their own knowledge about the residential street using their quiz [127]. All registered residential streets have been entered in a map, so that the residents know which street is a residential street [126]. With the help of this map the inhabitants can find out which street you can use as "living room".

[9] http://spaceandplace.at/ (last accessed on 2020-05-11)

[10] Translated from German: "*Menschen zum unbeschwerten und unterhaltsamen Austausch bewegen – an Orten, die auf den ersten Blick oft unscheinbar sind*"

[11] http://spaceandplace.at/wl/ (last accessed on 2020-08-18)

(a) *(b)*

Figure 4.3: Photos of wohnstrassenleben 2019 by Space and Place [125]

4.5.2 PlaceCity

The international project "PlaceCity[12,13,14] - Placemaking for Sustainable, Thriving Cities" [34] works to create better cities through placemaking and aims to permanently improve the quality of life in urban areas [20]. The aim is to create attractive public spaces and thus provide additional value to the public. PlaceCity works with and tests different topics and tools that enable the enhancement of public space. Furthermore, the project addresses long-term functional and utilization concepts as well as interim- and multiple use of public space. The project objective is to develop methods of urban development at the interface between formal and informal planning processes and to build an understanding of cooperation.

The people of Space and Place have been invited to contribute to the project PlaceCity and are helping to investigate the topic of placemaking [121]. The consortium that manages the project PlaceCity in Vienna includes Superwien[15], MA 18 (Urban Development & Planning)[16] and the University for Applied Arts – Social Design[17]. Space and Place tested placemaking in the central area of Floridsdorf, inviting people to participate on 27 November 2019.

4.6 Urban Informatics

Urban informatics is a new field of research that examines the relationship between people, places and technology [64]. Urban informatics was first defined by Howard Rheingold in "Cities, Swarms, Cell Phones: The Birth of Urban Informatics" in 2003. In 2011, Foth et al. give the following definition: "Urban informatics is the study, design, and practice of urban experiences across different urban contexts that are created by new

[12]https://smartcity.wien.gv.at/site/place-city/ (last accessed on 2020-05-11)
[13]https://placemaking-europe.eu/placecity/ (last accessed on 2020-05-11)
[14]http://socialdesign.ac.at/projects/placecity (last accessed on 2020-05-11)
[15]http://superwien.com/ (last accessed on 2020-05-11)
[16]https://www.wien.gv.at/kontakte/ma18/index.html (last accessed on 2020-05-11)
[17]https://www.dieangewandte.at/socialdesign_en (last accessed on 2020-05-11)

opportunities of real-time, ubiquitous technology and the augmentation that mediates the physical and digital layers of people networks and urban infrastructures" [38, p. 4]. Furthermore, they state that it "takes a transdisciplinary approach to understanding the city as an ecology that consists of technological, social, and architectural layers" [38, p. 4]. Foth states that urban informatics "requires a broad perspective across the triad of people, place and technology, and the associated disciplines of the social sciences (humanities and arts); computer sciences (and software engineering, ICT), and; spatial sciences (architecture, planning, and design)" [39, p. 6] (see Figure 4.4). For Rheingold "transdisciplinarity goes beyond bringing together researchers from different disciplines to work in multidisciplinary teams. It means educating researchers who can speak languages of multiple disciplines—biologists who have understanding of mathematics, mathematicians who understand biology" [41, p. 31].

In 2006, Foth et al. [38, 64] were among the first to create a research lab focused on urban informatics; it is called the Queensland University of Technology (QUT) Urban Informatics Research Lab. Since then, more researchers and labs have begun addressing the topic of people, place and technology.

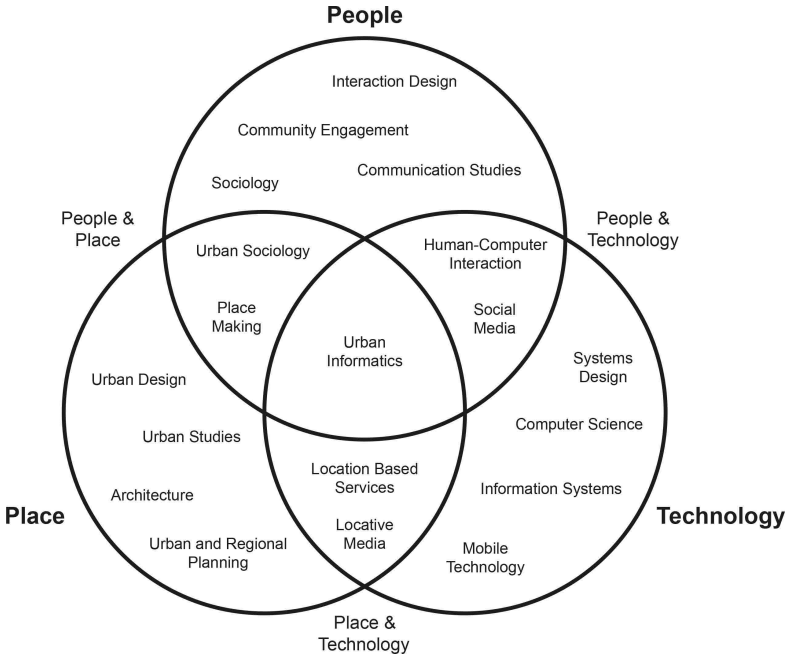


Figure 4.4: Transdisciplinary research across people, place and technology [37][36, p. 32]

4.6.1 People, Place & Technology

From April 2014 to April 2018 the Project CyberParks was founded by the H2020 European Programme Cooperation in Science and Technology (COST). CyberParks[18]

[18] http://cyberparks-project.eu/ (last accessed on 2020-05-10)

main task is to create a research platform for investigating the relationship between Information and Communication Technologies (ICTs) and the design of public spaces [24]. Its aim is to improve the use of ICTs in public spaces and to make them more appealing. Participants with different professional experiences and backgrounds have collaborated to gather information on this topic and publish the book "CyberParks - The Interface Between People, Places and Technology" [24] in 2019. The book presents a range of challenges and multidisciplinary perspectives on the topic of people, place and technology.

For Seeburger et al. [113], urban informatics takes a closer look at multimedia extensions in the urban field. They seek to use technology to influence and create new user experiences in public urban places. They explain that one approach to this goal is to enable citizens to interact digitally with other citizens and also with the public spaces of the city. Kjeldskov and Paay state that "adding a digital layer to the existing physical and social layers could facilitate new forms of interaction that reshape urban life" [71, p. 60][113, p. 118].

Technology can help increase the attractiveness of a public space and thereby be used to promote placemaking and create a sense of place [6]. Abdel-Aziz et al. argue that it is important that new social places are created "by giving new media a role in place-making" [6, p. 489]. They explain that information technologies enable the creation of new social places and give new dimensions and a new layer to public spaces in various domains. These technologies include Wi-Fi networks, media facades, interactive public displays and smartphone apps [6]. New dimensions can be brought to the domains of (1) culture and art, (2) education, (3) planning and design, (4) games and entertainment and (5) information and communication. The ways in which these information technologies can be used in the different domains is briefly explained below.

In the domain of education and culture. ICTs can be used to promote education in public space and teach people about history and culture [6, 108]. This can include interactive maps that show people points of interest. Technology can also be used in connection with tourist activities and attractions to provide people with information about culture and history. Furthermore, education in public space can be achieved by giving people access to information and knowledge through Wi-Fi networks.

In the domain of art. Screens and displays can be used to promote the work of different artists [6, 108]. The Times Square Alliance (New York) has used its digital advertising displays for art. This group seeks to present art in one of the most cited public places (Times Square) in the world.

In the domain of games and entertainment. By combining smartphone devices with digital screens and the use of Bluetooth, location-based games can be created [6, 58, 137]. The physical space becomes a game board, and the people are the players. With their smartphones, people can access and interact with the physical environment. Public

space projections on buildings, pavements or different objects can also be used to create an interactive games.

In the domain of design and planning. ICTs can help with modeling and with the realistic presentation of prototypes [6]. With the help of augmented reality apps, people can perceive urban space as it was, as it is and as it could be. For planning, technology can be used to analyze the space and its development in order to better use the public space in the future. In early 1970, the first documentary film "the social life of small urban spaces" by William H. Whyte explored the use of surveillance cameras to analyze how public space was used by the people living in the city.

In the domain of information and communication. In this area ICTs tools are used to keep the users informed about events and news [6]. This can be done by transferring the information to a public screen or via a wireless network.

4.6.2 People, Place & Technology: An Ethnographic Approach

This section explores urban informatics and the relationship between people, place and technology in order to understand why this relationship is important to implementing a successful system in public space.

Urban informatics studies begin with the context of use [113]. The researcher should investigate and observe the place itself and the people who use it in order to understand the context of use. An ethnographic approach can help in this examination. Ethnography originates from anthropology and is a practice in which researchers spend time with primitive societies to observe and understand how they live and what they do [114]. In the context of design, ethnography helps "to develop a thorough understanding of current work practices as a basis for the design of computer support" [114, p. 1]. Menezes et al. state that "urban ethnography brings together a number of perspectives and approaches to deal with cultural and social aspects of urban life, and as such it is able to provide an integrated methodological framework for the study of technology-public space relationship" [79, p. 1]. Furthermore, they argue that the ethnographic approach provides in-depth insight and facilitates a better understanding of existing phenomena.

Ethnography can be used to better understand how people live in a place. As discussed in previous chapters, a space becomes a place when people give meaning to it. The people, their experiences, emotions and behavior transform the space to a place [79]. In the context of urban informatics, ethnography can be used to discover how people spend time in third places and how they use technology during their daily activities [113].

Seeburger et al. in "Designing and Evaluating Mobile Multimedia User Experiences in Public Urban Places: Making Sense of the Field" [113] as well as Menezes et al. of CyberParks in "People - Space - Technology: An Ethnographic Approach" [79] have implemented and defined an ethnographic approach to study the relationship between people, place and technology. They developed questions and a procedure for each of the

areas to facilitate the successful use of technology in urban public spaces. They argue that researchers should develop new interventions that "align to current social practices and behaviour of people in public urban places rather than creating new ones" [113, p. 125].

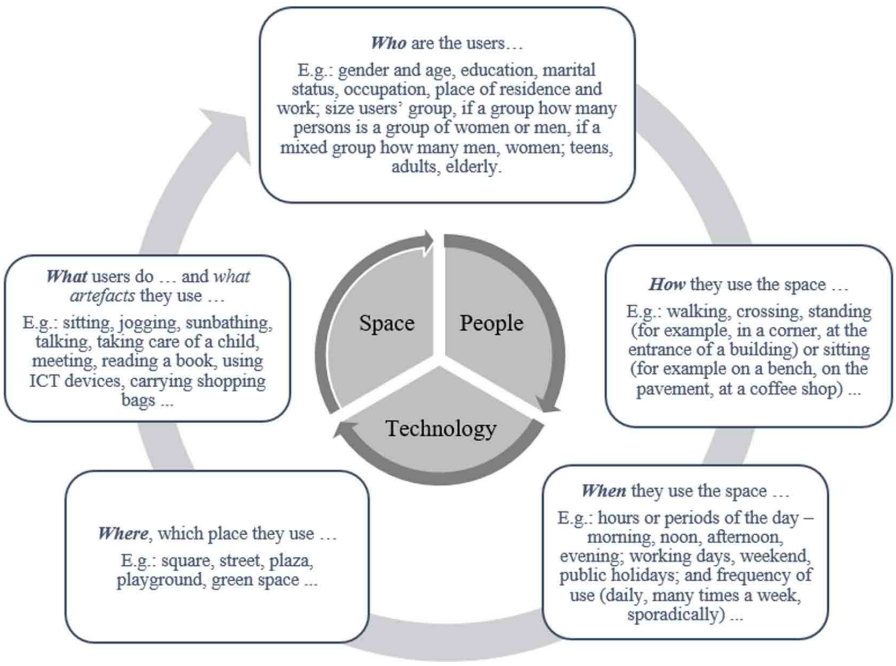


Figure 4.5: CyberParks ethnographic approach: capturing the relationship between people-space-technology [79, p. 79]

Menezes et al. [79] define general questions to be asked in connection with the people-place-technology relationship. Their aim is to "capture the relations between everyday micro-geographies in the use and appropriation of space, the use (or not) of technological artefacts and objects, the practices and socio-spatial representations, and the established relations between spaces, behaviours and environments in the constitution of urban places and landscapes" [79, p. 80-81]. Their method can thus be used as a basis for the development of a technological system in public space. The method provides insight into how people use public space and answers the following questions: Who are the users? How do they use the space? When do they use the space? Where, i.e. which places do they use? What do users do (and what artefacts they use) in the spaces? Figure 4.5 visualizes these questions.

In order to create a technological intervention in a public urban space and simultaneously create and influence an experience for people, Seeburger et al. developed an approach (see Figure 4.6) that consists of six steps [113]. It is important that existing technology generates a positive experience and does not unsettle, deter, demotivate, annoy or create other negative experiences people. In the first step presented by Seeburger et al., the context of use (i.e., the place) is examined. The place and the interaction of people with

this place are observed in order to understand how people use the place. Based on the results of the analysis, new technology is developed and then tested with the users. It is of great importance that the users are involved in the development process because this is the only way to ensure that the users' wishes are fulfilled and also to investigate the experience that the technology creates. The way in which the new technology influences or changes the use of the place as well as the experience in connection with the place should be assessed.

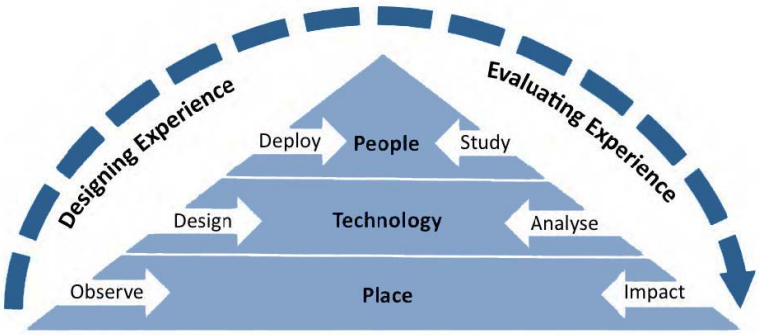


Figure 4.6: User Experience framework invented by Seeburger et al. [113, p. 128]

Seeburger et al. created questions to design and evaluate user experience and examine the people-place-technology relationship. The *technology* is used to create an experience for *people* (UX) in a particular *place*. Table 4.1 shows questions related to place, Table 4.2 shows questions related to technology and Table 4.3 shows questions related to people.

Table 4.1: Ethnographic approach by Seeburger et al.: Questions that should be asked in connection with place [113, p. 125]

Element	**Description**
Meaningfulness of the activities in the place	Are the activities in the place in the nature of business, pleasure, idling, or other settings?
Organizational / social setting	What kinds of activities are accomplished in the organizational and / or social setting?
Fashion	What is 'in fashion' according to the place?
Habits	What are the habits in the place?
Norms	What are the norms in the place?
Time of mobile mediated interaction	When does the interaction between urban dwellers occur? Are they synchronous, asynchronous, or both
Place of mobile mediated interaction	Where does the interaction take place? What kind of place is it? What are the entry barriers? (if any)
Accompanying persons	Do other persons usually accompany people or are people rather by themselves?

Table 4.2: Ethnographic approach by Seeburger et al.: Questions that should be asked in connection with technology [113, p. 125]

Element	**Description**
Purpose	What is the purpose of the application? Why should someone use it?
Functionality	Is the functionality sufficient to fit its purpose?
Complexity	Is the software complex enough to fulfil its task without hindering usability?
Usability	Is the software easy to use?
Aesthetics	Is the designed technology visually pleasing? Does the design support usability?
Acceptance	Does the application suit the place and support current social practices?

Table 4.3: Ethnographic approach by Seeburger et al.: Questions that should be asked in connection with people [113, p. 125]

Element	**Description**
Requirements	What are the technological requirements people must master to use the technology?
Motivation	What motivates people to use the technology? What need does it fulfil?
Prior Experiences	How do prior experiences influence technology usage?
Feelings	How do people feel about using the technology?
Affect	How does the technology affect the user?
Emotions	What kinds of emotions are created through using the technology?
Enjoyment	Do people enjoy using the technology?
Likeability	Do people like the technology?
Social Interaction	How does the technology support sociability? What kind of social interaction takes place?

CHAPTER 5

User Experience Research Methods

This chapter deals with the user experience research methods that were used to create this thesis. In the Section 5.1, the difference between qualitative and quantitative research is explained. Afterwards, the topic of thematic analysis is discussed (Section 5.1.3). Thematic analysis is needed to analyze the qualitative data. The methods used to obtain the qualitative and quantitative data are explained in Section 5.2. The final part of this chapter explores the topics of design thinking and prototyping (Section 5.3 and 5.4).

5.1 Quantitative & Qualitative Research

Braun and Clarke state that "the most basic definition of qualitative research is that it uses words as data, collected and analysed in all sort of ways. Quantitative research, in contrast, uses numbers as data and analyses them using statistical techniques" [22, p. 3-4].

5.1.1 Quantitative Research

Johnson and Christensen explain that quantitative research "relies on the collection of quantitative data (i.e., numerical data)" [68, p. 82]. Quantitative research seeks to find a connection between measurable variables and thus create a generalization of the findings [22, p. 4]. The data obtained is "shallow" but broad, which means that a large amount of data is collected from many participants, but the data obtained is not complex. A large amount of data is needed to allow statistical evaluation. The method used in quantitative research is fixed at the beginning, and changing focus after the data collection has begun is challenging.

5.1.2 Qualitative Research

Johnson and Christensen further explain that "qualitative research relies on the collection of qualitative data (i.e., nonnumerical data such as words and pictures)" [68, p. 82]. Qualitative research seeks to understand and interpret meanings and seeks to view the collected data in context [22, p. 4]. It can produce knowledge that contributes to a general understanding. A qualitative approach produces "narrow" but rich data, which means that there are fewer participants, but the data are very detailed and complex. The method used is less fixed, which means that a shift in focus can happen during the execution.

5.1.3 Analyzing Qualitative Data: Thematic Analysis

In the 1970s, Thematic Analyis (TA) was first developed by Gerald Holton, a physicist and historian of science, as a named approach [22]. It was not until 2006 that Braun and Clarke distinctively defined the method by developing a systematic, six-phase process. For Braun and Clarke "thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail" [23, p. 6]. One strength of this method is that it can be used to answer almost any type of research question (except questions about language practices) [22]. In TA it is important to identify what counts as a theme. A theme captures something important in the data that is also related to the research question [23]. A theme therefore represents a patterned meaning within the data set.

The six phases of the systematic approach to TA developed by Braun and Clarke [23] will be briefly explained in more detail below.

Phase 1: Familiarization With the Data. In this first phase the researcher familiarizes himself/herself with the data [23, p. 16-18]. If verbal data was collected, it is transcribed to be able to perform the TA. The data is read repeatedly, and an attempt is made to read it actively, which means looking for meaning and patterns in the data.

Phase 2: Generating Initial Codes. After the first phase is completed, initial codes for the data are produced [23, p. 18-19]. "Codes identify a feature of the data that appears interesting to the analyst, and refer to the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" [23, p. 18]. In this phase, the data is systematically scanned to find interesting and important aspects in the data. These can possibly form the basis of repeated patterns (themes) in the entire dataset.

Phase 3: Searching for Themes. In this phase, the codes created in the previous phase are examined more closely and assigned to potential themes [23, p. 19-20]. The themes are derived from the existing codes. Tools and approaches that can be helpful in this phase include the creation of mind-maps, tables or writing down the codes.

Phase 4: Reviewing Themes. In this phase, the themes are examined again in more detail [23, p. 20-21]. It may turn out that the themes initially identified are not valid because there is too little data or the data is too varied. Certain themes may also need to be further divided. The differentiation of the themes and the data in these themes is of great importance.

Phase 5: Defining and Naming Themes. This phase involves developing a detailed analysis of each theme [23, p. 22-23]. The focus and scope of each theme is defined. A meaningful name is chosen for each theme, and if necessary, sub-themes are defined.

Phase 6: Producing the Report. In the final phase, the analysis and report is prepared [23, p. 23]. This report should represent more than just the data itself. The analytical narrative and data extracts must be linked together and the analysis should be contextualized in relation to existing literature.

5.2 User Research Methods

URM are methods that are used to learn more about the users of technology [26]. These include a variety of methods to collect data and gain insight into the context of technology use. The URM used to collect quantitative as well as qualitative data are explained in the following.

5.2.1 Ethnography

> "Ethnography is a tool for better design" – AIGA - the Professional Association for Design [27, p. 1]

Effective design should always relate to people [27]. Designers should assess the product they create to learn how it is received by other people. Furthermore, a thorough understanding of current practice should form the basis of the design of new products [114]. Ethnography can help establish this understanding of current practice. Ethnography is used to observe people in their natural environment and not in an artificially created one [27]. Ethnography helps to:

- **Discover meaning:** Ethnography helps to better understand how people make sense of their world. Observing people and examining the artifacts that are important to them can inform the development of products that create meaningful experiences.
- **Understand norms:** The cultural norms should support design decisions. For example, the use of color must be adapted to cultural norms, as the same color can represent different things in different cultures.

- **Make communications powerful:** Ethnography helps determine the best strategy to communicate within a culture. Communication should be done in a way that is culturally understandable. Observing people can reveal how words or design elements are understood and what they trigger in people.

- **Observe reality:** What people say and what they do are not always the same. With the help of ethnography, the difference between what people think they are doing and what they really do can be determined.

- **Identify barriers:** The specific problems people experience, people's pain points can be easily identified using this ethnography. For example, a commute by car can be made easier by placing a cup holder in the car. Observing people can reveal important details, such as that it is better to place a cup holder on the left side than in the middle because it is less distracting.

The main methods used in ethnography are observations, interviews and video analysis [114]. In the following two sections the methods observation and interview are explained in more detail. Video analysis will not be discussed further, as this method is not part of the selected URM.

5.2.2 Observation

Observation can help the researcher understand why people behave in a certain way in a certain context [54]. For Becker and Geer observation is "that method in which the observer participates in the daily life of the people under study, either openly in the role of researcher or covertly in some disguised role, observing things that happen, listening to what is said, and questioning people, over some length of time" [13, p. 133]. Participant observation is one of the most natural but also one of the most challenging qualitative data collection methods [54]. The researcher must be embedded in the action and context of a social setting and at the same time take on the role of the researcher – taking notes; recording voices, sounds, and images; and asking questions. Almost every setting where people interact with each other or with an object can be observed.

5.2.3 Interview

Interviews are one of the most common methods used in the social and health sciences [22]. Furthermore, interviews are the most common qualitative method of data collection.

An interview can be conducted to collect qualitative or quantitative data [31]. A structured interview is used to collect quantitative data, and to collect qualitative data a semi-structured or unstructured interview should be conducted [22]. In a structured interview, the questions and answers are predetermined by the researcher. In a semi-structured interview, the researcher prepares a list of questions (interview-guide), but it is possible to deviate from this list and discuss additional topics that were not foreseen by the

researcher. In an unstructured interview, the researcher has, at most, a list of topics that can be discussed during the interview. This type of interview is largely participant-led.

Further distinction can be made as to how interviews are conducted [22]. Generally they are conducted face-to-face. Virtual interviews are interviews that are conducted via telephone, email or online interviews. If the interview is conducted face-to-face, it means that the participants are having a conversation. This conversation is usually audio-recorded and then converted into written text (transcript). This text is then used to analyze the content of the interview.

Interviews help researchers learn about people and gain insight into their thoughts, experiences and interpretations of relevant issues [31]. Various types of people, including experts, users or groups, may be the subjects of interviews. Experts can help researchers improve their technical understanding of the subject they are investigating.

Interviewing an expert in the exploratory phase can be more effective than other methods of data collection [15]. Interviewing experts can help shorten the time-consuming data gathering process and can be used to quickly obtain strong results. Furthermore, expert interviews can be used when access to a certain social field is limited.

5.2.4 Survey

Surveys are a method for gathering information about individuals such as their knowledge, beliefs, attitudes and behavior [17]. Surveys can be used in qualitative as well as quantitative research [91], depending on how the questions are formulated. Open-ended questions are used to collect qualitative data [22]; whereas, closed questions facilitate the collection of quantitative data and consist of multi-choice grids, multiple-choice questions and pick lists.

Surveys can be divided into three major formats [22]: hard copy (paper and pen), email and online. Hard copy surveys are distributed by hand or mail. Participants write their answers on a sheet of paper and then send their answers back by mail or return it by hand. Email surveys are often created as a text document and then sent via email to the participants. The participants complete the survey electronically and send it back to the researcher. Another option is for participants to print the document, fill it out and then return it to the researcher. Online surveys are created using a platform to post the questions online. The participants receive a link to fill out the survey, which is sent to the researcher automatically upon completion.

5.2.5 Thinking Aloud

The method of thinking aloud is used to understand and gain insight into the thought process of participants [16]. The test participants are asked to think aloud while doing a task. The method can be used to study problem-solving and to evaluate designs [144]. Jakob Nielson[1] states that “thinking aloud may be the single most valuable usability

[1] https://www.nngroup.com/people/jakob-nielsen/ (last accessed on 2020-07-14)

engineering method" [83, p. 195]. He states that "in a thinking aloud test, you ask test participants to use the system while continuously thinking out loud — that is, simply verbalizing their thoughts as they move through the user interface" [84, Section "Defining Thinking Aloud Testing" - Definition]. However, he also explains that it is not always easy for users to verbalize their thoughts. Therefore, the researcher needs to encourage the test subjects to think out loud. Thinking aloud enables designers to find out what users think of a design, learn more about misconceptions and thus better adapt the design to the wishes of the users. Furthermore, users can indicate why they do not understand something, making it is easier to adapt the design. This method can be used in any stage of the development lifecycle.

5.3 Design Thinking

Sarah Gibbons of the Norman Nielson Group states that design thinking is an "ideology supported by an accompanying process" [52, Section "What — Definition of Design Thinking"]. She further states that "the design thinking ideology asserts that a hands-on, user-centric approach to problem solving can lead to innovation, and innovation can lead to differentiation and a competitive advantage. This hands-on, user-centric approach is defined by the design thinking process." The design thinking process consists of six different phases: empathize, define, ideate, prototype, test and implement, which are visualized in Figure 5.1. It should be noted that the design thinking process is not approached in the same way by every expert or academic. Waidelich et al. closely examine the different process models of design thinking [147]. Design thinking is a user-centered process that starts with the data of the user. From this data, artifacts are created that represent real user needs, and these artifacts are then tested with real users. Jakob Nielsen says that "a wonderful interface solving the wrong problem will fail" [52, Section "Why — The Advantage"]. It is therefore very important to strive for a user-centered process.

The six phases of the design thinking process are briefly explained in more detail below [52].

Empathize. In this phase information about the user is collected to gain a better understanding of what the user does, feels and thinks. The aim is to gather information in order for the researcher to empathize with the users and their views.

Define. In this step all information is considered, and the problems of the users are defined. The user needs are assessed more closely, and innovation opportunities are identified.

Ideate. The user needs are examined again, and different ideas are developed. No idea should be excluded or ignored. In this phase as many ideas as possible are collected. These ideas are then sketched.

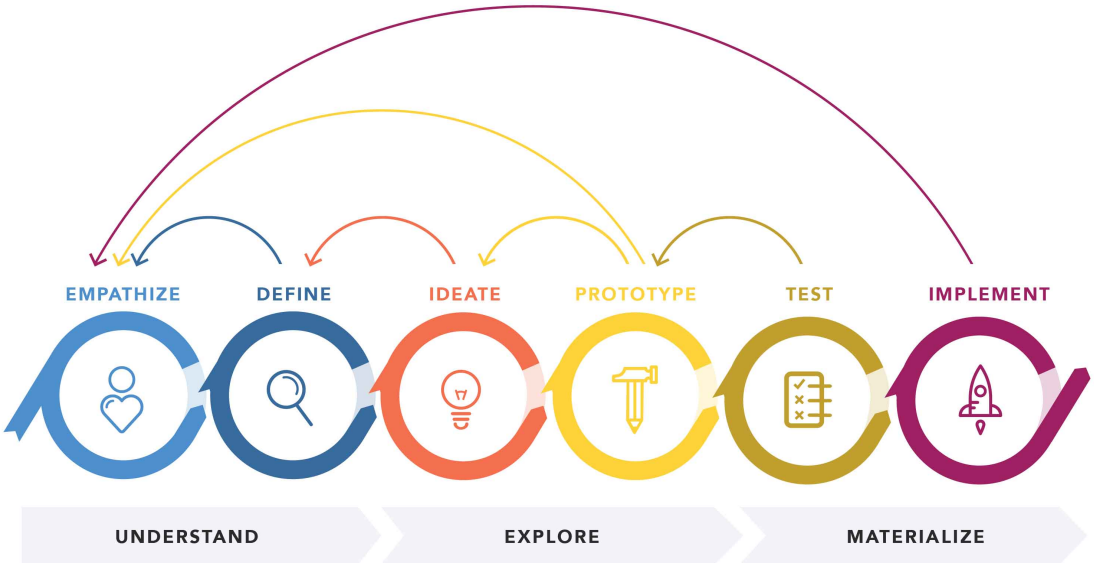


Figure 5.1: Design thinking process used by the Norman Nielson Group [52]

Prototype. In this phase real tactile representations of the ideas are created. The goal is to find out which ideas work and which do not. Feedback is obtained, and the prototype is checked for feasibility.

Test. In this phase the prototype is tested with real users. It is assessed to find out whether it brings added value for them and if it meets user needs.

Implement. In this phase the idea and the vision for the product are implemented. The final prototype or the final product is implemented.

5.4 Prototyping

Prototyping is a process in which ideas are made tangible in order to test quickly and make improvements based on feedback [77]. "Fail early and fail often" [77, p. 186] can be understood as the mantra of prototyping. By using this method in early stages of implementation, new ideas and solutions can be tested inexpensively [77]. With the help of a prototype, design errors and failure factors can be reduced [70]. In addition, a prototype can be used to check whether the design works and is used in the way the designers intended. Prototyping is an iterative process in which a series of prototypes are created [77]. The individual prototypes are tested, feedback is built in and a new prototype is created.

Prototyping can be divided into three categories: exploratory, experimental and evolutionary [78]. The goal of an *exploratory prototype* is to clarify the requirements of the system to be developed, which is very helpful in the early stages of development.

With the help of this prototype, ideas for development of the design can be collected. In *experimental prototyping* a prototype is built which is the solution for a certain problem. The prototype is then tested by experimental use and assessed to find whether the proposed solution is suitable for the specific problem. *Evolutionary prototyping* refers to the gradual adaptation of a design. Each product consists of different versions. In each version something new is added or something is changed.

Sketches help a design team present a product design in a quick and disposable manner [77, 56]. The sketches contain sufficient detail that the designers can assess how a product is used. Sketching is not about testing the product or the design. For example, when developing a website or smartphone app, the user screen views are sketched. These views are linked together to better understand and test the process. In prototyping, a distinction can be made between a low fidelity (low-fi) and a high-fidelity (hi-fi) prototype [77]. The low-fi prototype presents the basic functions of the product to be developed in order to test a concept or idea or to answer a specific question, such as which design is better. In a later step, fully functional hi-fi prototypes are created. These are very similar to the final product and offer real interaction.

Part II

Practical Part

Part II Practical Part of this thesis discusses the methods used to answer the research questions as well as the development of a socio-technical prototype. This part of this work consists of two chapters: Applied User Research Methods and Prototyping. The exact procedures and the results of these methods are presented. The applied URM to collect qualitative and quantitative data as well as the individual phases for the development of the prototype are discussed in detail.

Chapter 6 Applied User Research Methods deals with the applied URM. The sections in this chapter present the implementation and execution of the URM and the methods for analyzing the quantitative and qualitative data. In addition, each section summarizes the results of the methods. A total of four URM were applied: 6.1 Expert Interviews, 6.2 Observation, 6.3 Online Survey and 6.4 Interviews.

Chapter 7 Prototyping explains the development of the prototype through phases. Section 7.1 The Initial Prototype Idea discusses the development of the prototype in more detail and explains how the collected data influenced the development. In Section 7.2 Features and Functionality and Section 7.3 Sketches, the features and functionality of the initial prototype idea are explained, and the creation of the sketches that represent these features and functionalities is presented. The implementation, execution, data analysis and results of the evaluation of the low-fi and hi-fi prototype are discussed in Sections 7.4 Low Fidelity Prototype and 7.5 High Fidelity Prototype. Finally, the final prototype, the corporate identity and the concept of the final prototype are explained in Section 7.6 Final Prototype.

Literature Review

The literature research was executed in three different phases: (1) defining the research question and focusing the research topic, (2) answering the research questions and (3) performing additional research in the ideation and implementation phase.

First, a literature review was performed in order to focus the research and to define the research questions. The topics urban development, public space, projects in public space, submission of projects, development of a system in public space, people-place, technology, governance, *Ermöglichungsflächen* and Seestadt Aspern, residual spaces, urbanity, participation, appropriation, communal spaces, do-it-yourself, everyday public spaces, urban commons, well-being, social interactions, placemaking, interactive screens, urban screens, smart and interactive furniture, senseable city, designing public space and digital adjustment of physical surroundings were considered. Reviewing studies on these topics influenced the development of the research questions. After completion of the initial search, the research questions were defined and further literature review concentrated on exploring the three research questions. During the ideation, testing and implementation phase of the design thinking process, additional literature research was conducted. This focused on existing technologies and interfaces.

Ethics

The data collected during the investigation contained sensitive or personal information. For this reason a consent form was created. The consent form contained the following information:

- Identity of the thesis author / interviewer
- Explanation of what the author is doing and why
- Data handling (the data will be made anonymous, except in the case of experts who do not wish to be anonymized)
- Data collection methods (notes, video, audio)
- Rights of participant (can choose to stop at any time without reason)
- Contact details (the author's and the advisor's)

The consent form was handed out on site before all interviews or sent by email in advance. Only after the consent form had been read and signed was the interview performed. The consent form was distributed with each URM, except the online survey. For further information on ethics, we refer to the book "Successful Qualitative Research - a practical guide for beginners" by Braun and Clarke [22, p. 61-68].

CHAPTER 6

Applied User Research Methods

This chapter presents the applied URM. For each of the individual methods, the implementation, execution, analysis of the quantitative and qualitative data and a summary of the results are discussed. A total of four methods were used to answer the research questions: expert interviews, observation, an online survey and interviews.

6.1 Expert Interviews

This URM was used to obtain expert opinions on the topics of participation, public space, the City of Vienna, appropriation, projects in public space in general and successful projects in the City of Vienna in particular. Experts from different disciplines were selected. The opinions of the experts were intended to help guide development of the prototype idea and to learn more about the relevant topics. The expert interviews also aimed to help focus the theoretical foundation of this thesis.

6.1.1 Implementation

A consent form was created for the expert interviews (see Appendix A.2 and II Ethics). A semi-structured interview guide was also prepared before each interview. Information about the experts was reviewed, the experts' homepages were read and their projects were searched for. Each interview consisted of different topics and three main parts, the first and the last part being the same for each expert. The first part consisted of a short introduction explaining the overarching topic of the interview, what the results of the interview would be used for and the main topic of the thesis. After this information was discussed with the experts, personal questions were asked to explore career details, why they chose their field and which projects were currently being worked or planned for the near future. These questions were intended to provide a thorough introduction to the interview and not put pressure on the expert. The middle part of the interview

covered several topics (usually between 4-11) that were identified during the research on the experts (e.g., participation, submission of projects, open space, etc.). The number and nature of the topic areas were adapted to the expert. For each topic area, questions were written to add value to the results and provide answers to the research questions. The last part of the interview always consisted of asking the experts if they would like to comment further on the topic or whether they would like to address a topic that could be important to the author's research but had not yet been addressed. Furthermore, they were asked for permission to contact them again in case of questions or uncertainties in order to identify whether renewed questioning would be appropriate. At the end of the interview, the experts were thanked for their time and for answering the questions.

6.1.2 Execution

During the literature review, interesting projects, organizations and people relevant to the thesis topic were identified. From these, experts were selected to help provide insight into their field of expertise. The experts were contacted by email and asked if they would be willing to participate in an interview. As soon as they accepted, appointments were made. Five interviews took place face-to-face in the offices of the experts and one occurred online via Zoom. The consent form was either read and filled out during the personal interview or sent by email. At the personal meetings, two printed consent forms were always brought along and signed. One for the expert and one for the author of this thesis. Only after they had agreed to the audio recording would the audio recording device (app on the smartphone) be switched on. Two experts requested the interview guide in advance, and this was sent by email.

A total of six expert interviews were conducted, and the interviews lasted 45–90 minutes (audio recording between 35–70 minutes). The interview guidelines were not always followed. During the interview, other questions were sometimes asked and the expert's statements were sometimes elaborated on. The following is a brief overview of the experts (i.e., what training they had and why they were selected for this interview). Furthermore, a short overview of the topics discussed is provided. The results of all interviews are discussed in detail in section 6.1.4 Results.

Expert Interview 1

The first interview took place on 07.01.2020 from 10:00–10:45 in the expert's office. This expert did not wish to be named, so no personal information will be disclosed. The expert had studied landscape planning and management, and the expert's main focus is on open space planning and mobility, participation, research, mediation and gender.

Topics Discussed. The interview addressed the topics of public space, public space as social space, privatization of public space, citizen participation and activation of citizens, *Ermöglichungsflächen* of the Seestadt Aspern and submission of a project implemented in public space.

Expert Interview 2

The second interview was conducted on 13.01.2020 between 14:00–14:40 in the expert's office. This expert wished to remain anonymous; therefore, no personal information is disclosed. The expert was trained in the field of landscape planning and landscape maintenance and had been working on the subject of the Seestadt Aspern and the *Ermöglichungsflächen* for a few years. The expert's focus is on participation projects, editorial work, media and public relations work, development and monitoring of community garden projects.

Topics Discussed. The interview explored the topics of *Ermöglichungsflächen*, public participation/appropriation and submission of a project implemented in public space. The discussion of *Ermöglichungsflächen*, addressed how the inhabitants of the Seestadt Aspern perceive these areas, what names the areas have and future projects and submissions planned for the areas.

Expert Interview 3: Martin Hofmann

The third expert interview occurred on 06.02.2020 from 14:00-14:45. Mr. Martin Hofmann from *Grätzloase* was interviewed. The interview took place in the office (Grüngasse 9/5; 1050 Vienna) of *Grätzloase*. The *Lokale Agenda* 21 is an association financed by the City of Vienna and its main task is citizen participation. The *Lokale Agenda* is commissioned by the districts and carries out citizen participation. Another task of the *Lokale Agenda* is the *Grätzloase*. The *Grätzloase* (for further information see Section 2.3.5 *Grätzloase*) is responsible for citizen participation throughout Vienna, whereas the *Lokale Agenda* focuses on the districts. Mr. Martin Hofmann helps the residents with the implementation of projects and supports them during the entire implementation. Mr. Hofmann requested the interview guide in advance, so a pilot test was conducted for this interview guide to ensure that all the written questions were understandable and that the language and grammar were correct. The interview guide was sent to Mr. Hofmann as a PDF.

Topics Discussed. This interview covered the topics of *Grätzloase* and *Lokale Agenda*, submission and approval of projects, project submission process, duration of submission, responsible municipalities, citizen participation and activation and criteria for projects implemented in public space.

Expert Interview 4: Dr.^{in} Brigitte Vettori

The 4th expert interview was conducted on 10.02.2020 from 11:00–12:15, and Dr.^{in} Brigitte Vettori was interviewed. Dr.^{in} Vettori is part of Space & Place - *kulturelle Raumgestaltung*. The interview took place in the *Bürogemeinschaft - Grätzlgalerie* (Kriemhildplatz 10; 1150 Vienna). The recording of the interview was sent by email to Dr.^{in} Vettori, as she requested it for her own records. Dr.^{in} Vettori is a cultural and social anthropologist who joined Space and Place (see Section 4.5.1) in spring 2009 [122]. She herself introduced

the term *kulturelle Raumgestaltung*, which for her means the active participation in the design of places and spaces (i.e., social spaces and urban places).

Topics Discussed. This interview covered the topics of citizen participation and activation in general and with different age groups, initiatives and partners for future projects in Seestadt Aspern, approval of projects, ethnography, feel-good factors of public space, submission of projects and projects (*Wien lebt, Wohnstraße, Audioskop, Königsstuhl*) in public space to activate citizens.

Expert Interview 5: DI Sabine Gstöttner

The 5th expert interview occurred on 12.02.2020 from 09:00–10:30 with DI Sabine Gstöttner in her office (Esslinger Hauptstrasse 84-86/Top 3; 1220 Vienna). She founded the technical office for landscape planning Inspirin [63], which was commissioned by the City of Vienna to conduct the development and accompanying research of *Ermöglichungsflächen* in public space called "*Ermöglichungsflächen im öffentlichen Raum*" [1]. Due to this report and her knowledge about *Ermöglichungsflächen*, DI Gstöttner was asked for an interview. She studied landscape architecture, and the main focus of her company is urban open space research, object planning, district work, architecture teaching and urban planning.

Topics Discussed. During this interview, the report *Ermöglichungsflächen im öffentlichen Raum* was discussed. The results were explored in detail as well as the history of the report, the appropriation of areas, moderation of projects, the corporate identity of the *Ermöglichungsflächen*, the results for the *Möglichkeitszonen* as well as the *Ermöglichungsflächen* and public participation.

Expert Interview 6: Mag. Jan Peters-Anders

The sixth expert interview took place on 03.06.2020 from 13:00–14:00 via Zoom and was conducted with Mag. Jan Peters-Anders, who is a research engineer at AIT. He teaches the class "Open GIS and Open Data in Geoinformation Processing"[1] at the University of Vienna, sharing his interdisciplinary knowledge in computer science, geography and open data. Mag. Peters-Anders was selected for the interview because he was involved in the development of the Smarticipate project (see Section 3.6.6).

Topics Discussed. The main topic of this interview was the Smarticipate project. The genesis and basic idea of the project, the use of open data, the creation of topics, the Dipas project (see Section 3.6.5), partner cities where the project was implemented, "Create your own app", importance of exchange with citizens and keeping them up-to-date as well as lessons learned were all discussed.

[1] Translated from German: "*Open GIS und Open Data in der Geoinformationsverarbeitung*"

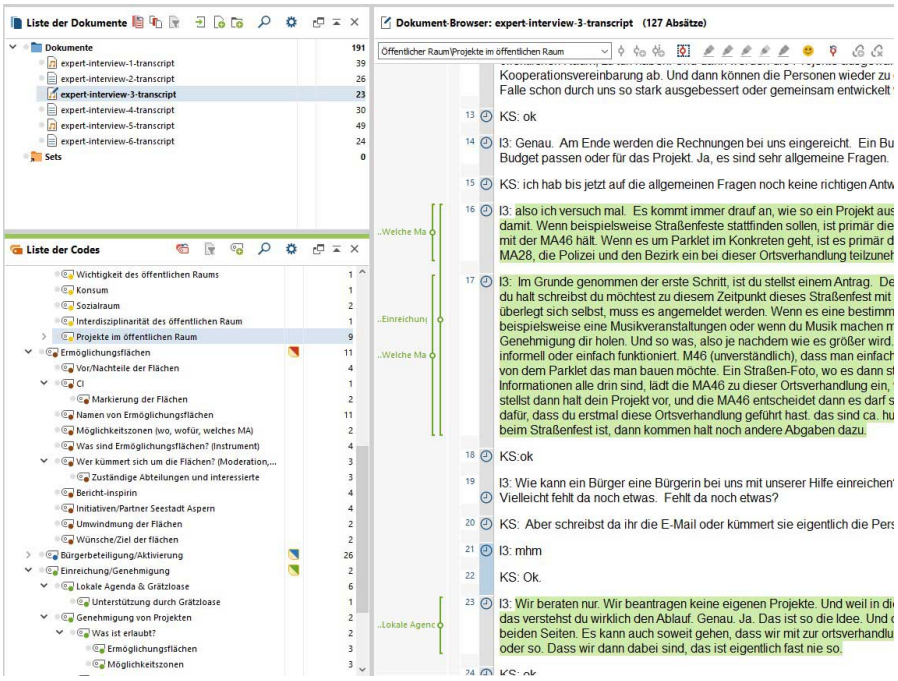


Figure 6.1: Thematic analysis using MAXQDA. The upper left corner shows the analyzed files, the lower left corner shows the individual codes/themes and the right side shows the analyzed text itself. Furthermore, the assigned codes/themes are marked in the text and the name of the codes/themes are displayed.

6.1.3 Data Analysis

After the expert interviews were completed, the audio recordings were converted to text. A transcript of the entire audio recording was created using the program f4transcript[2]. This qualitative data was analyzed using thematic analysis. The MAXQDA program was used to code and generate themes, and Figure 6.1 visualizes a part of the analysis performed. Different codes were created, and these were marked in the text. When all the text was marked, the results for a specific code/theme could be visualized, meaning all parts of the text were displayed, and the analysis could be completed.

6.1.4 Results

This section contains the results of the thematic analysis of all the expert interviews. The results are divided into thematic areas. Specific quotes and statements from the experts are marked E1–E6, where E1 refers to statements of the expert from Expert Interview 1. The numbering of the experts does not refer in any way to the importance of the interview but refers to the chronological order in which the interviews were conducted.

[2]https://www.audiotranskription.de/f4 (last accessed on 2020-05-13)

Public Space

The design of public space and the implementation of projects in public space is an interdisciplinary task. In discussing this topic, E1 stated that dealing with

> "public space in the city or in rural areas [...] is just a very interdisciplinary task. Interdisciplinary approaches come into play when we want to understand space and what people do in space, but we also have to deal with different disciplines."[3] – E1

This indicates that an interdisciplinary approach is of utmost importance for the development and implementation of a project in public space. Only by understanding all different disciplines can a successful project be developed.

The design as well as the transformation of the public space is of great importance. E1 indicated that the "upgrading of these spaces"[4] is of great importance. Furthermore, E1 stated that public spaces must

> "be made fitter for the future, so that they can meet future requirements, such as climate change. [...] right now a big topic: heat in the city, summer heat. But also the coexistence of different population groups. Active mobility [...]. And also that the public space enhances quality of life [...] the inhabitants have very little private green space or open space. There are often no balconies in the apartments, there are no communal areas for use except for atriums. This means that they are dependent on the open space and often also on the street space, because there are not so many parks."[5] – E1

Use by different groups as well as the lack of public or open space for residents should be taken into account when planning public spaces. The redistribution of open space by converting the street space into a social space is an important issue. This transformation is happening more and more. Parklets are becoming more common in the city, transforming the public space into a social place that invites people to stay.

[3]Translated from German: *"öffentlichen Raum, mit der Stadt oder a im ländlichen Raum [...] ist halt sehr interdisziplinär. Interdisziplinäre Ansätze, die zum Tragen kommen, wenn man einfach Raum, und des was die Menschen im Raum tun, verstehen will. Dann muss man sich halt auch mit verschiedenen Disziplinen auseinandersetzen."*

[4]Translated from German: *"Aufwertung dieser Räume"*

[5]Translated from German: *"fitter für die Zukunft gemacht werden, dass sie den zukünftigen Anforderungen z.B. Klimawandel gerecht werden. [...] Grad ein großes Thema: Hitze in der Stadt, sommerliche Hitze. Aber auch das Zusammenleben von unterschiedlichen Bevölkerungsgruppen. Aktive Mobilität [...]. Und auch, dass der öffentliche Raum mehr Aufenthaltsqualität gewinnt [...] die Bewohner und Bewohnerinnen sehr wenig privaten Grünraum oder Freiraum haben. Es gibt oft keine Balkone bei den Wohnungen dabei, es gibt keine gemeinschaftlichen, nutzbaren Bereiche, außer irgendwelche Lichthöfe. Das heißt, sie sind angewiesen auf den Freiraum, also oft auch an den Straßenraum, weil es nicht so viele Parkanlagen gibt."*

The well-being factors important to residents were discussed with E4. She indicated that "Yes, just like shading, green, water and more or less quiet, the mixture of different people. It is actually quite good when there are different people."[6]. She also stated that "Some people don't want contact with others, but there are also people who observe first. On the residential street, you can observe quite a lot, and you don't have to join in. Then, maybe one day you will join in after all."[7] The greening of public space as well as including water and peaceful areas are therefore, in her opinion, among the feel-good factors of the Viennese. Furthermore, it is beneficial if people can decide whether they want to participate directly in what is happening or just observe.

Approval and Submission of Projects to the City of Vienna

The issue of which projects can be successfully submitted to the City of Vienna and how the process of such a submission is organized was an important topic in five of the six interviews. This information should help understand which preconditions need to be met and to which magistrate the application should be sent.

Submission. Projects can be submitted directly to the City of Vienna. *Grätzloase* and *Lokale Agenda 21* are organizations that support people in submitting projects to the City of Vienna. The aim of *Grätzloase* is

> "self-empowerment. In other words, citizens know how things work in the city [...] and actively participate in the city. [...] The aim of the *Grätzloase* is to implement smaller projects that address the topic of sustainability and participation."[8] – E3

When a project is submitted with the help of *Grätzloase*, it is checked in advance for correctness as well as for compliance with the guidelines of the City of Vienna. Expert E3 noted that often project submissions are rejected by the city because they do not comply with the guidelines, and the residents think that the project cannot be implemented at all. However, the lack of compliance is frequently due to small things that are not correct or additional information that is missing, and the *Grätzloase* supports the residents in such cases. E3 further states that

> "actually only some information or something was missing, or the project would have been approved if only the scaffolding were a little bit higher or

[6]Translated from German: *"Ja ebenso Beschattung. Grün, Wasser. Mehr oder weniger Ruhe. Die Durchmischung. Wenn man verschiedene Leute hat. Das kommt eigentlich schon gut an."*

[7]Translated from German: *"Manche [Menschen] wollen keinen Kontakt. Aber es gibt Leute, die beobachten zuerst. Auf der Wohnstraße kann man ganz viel beobachten und muss nicht mittun. Und vielleicht irgendwann einmal geht man dann doch rein."*

[8]Translated from German: *"Ziel ist einerseits dieses self-empowerment d.h. BürgerInnen wissen, wie die Abläufe in der Stadt laufen [...] und in der Stadt aktiv mitzuwirken. [...] Ziel der Grätzloase ist es kleinere Projekte umzusetzen, die sich mit dem Thema Nachhaltigkeit und Beteiligung beschäftigen."*

> something. And many citizens, I personally believe, don't even bother to call first and ask: I would like to do this, how can we do it? Or how would it be approved? Instead, they simply hand it in, and then they get a negative answer."[9] – E3

Most of the projects submitted to the *Grätzloase* come from groups of people, small businesses, clubs or offices "who say they want to be more present for the neighborhood. Or clubs, who [...] are also involved in cycling."[10]. E3 further explained that such companies submit parklets "that then offer bike repair or something like that outside."[11]. Rarely private people submit projects via the *Grätzloase* to the City of Vienna.

Submission: Procedure & Magistrates. Depending on where the project is to be implemented or what type of project it is, different magistrates are responsible for the approval of the submission. E2 indicated that submissions should be sent by email to the MA46 in which

> "the classic W questions are answered, including what happens, when and where exactly. It is best to make a sketch. In answering "what" you have to describe what is done, what is set up, what entertainment and what games are offered (e.g., at the play streets), so that they can imagine what happens there."[12] – E2

After this email is sent to the MA46, the MA46 will invite the submitter and the district to an on-site hearing. Furthermore, all magistrates, departments or institutions for which the submission might be of interest are invited by the MA46:

> "Very often a representative from the police is present. If there are many shops in the street, then someone from the Chamber of Commerce or a shopping street association or something like that will be invited. If it is has

[9] Translated from German: *"aber eigentlich fehlten nur ein paar Informationen, oder sowas, oder das Projekt wäre trotzdem gegangen, wenn nur ein bisschen das Gerüst höher wäre oder so. Und viele Bürgerinnen, glaube ich jetzt persönlich, überlegen gar nicht zuerst mal anzurufen und zu fragen: Ich würde das gerne machen, wie könnten wir es machen? Oder wie wäre das denn genehmigungsfähig? Sondern reichen das dann halt einfach ein, und dann kriegen sie einen negativen Bescheid."*

[10] Translated from German: *"die sagen, sie wollen für die Nachbarschaft nochmal präsenter werden. Oder Vereine, [...] die sich dann auch mit dem Radfahren beschäftigen."*

[11] Translated from German: *"die sich dann auch mit dem Radfahren beschäftigen, also Parklets, die dann draußen Radreparatur oder sowas anbieten."*

[12] Translated from German: *"die klassischen W-Fragen beantwortet werden. Also was passiert, wann, wo genau, am Besten macht man noch eine Skizze. Beim "was" muss man halt beschreiben, was wird da gemacht, was wird aufgestellt, welche Animation, welches Spielangebot wird geboten z.B. bei den Spielstraßen, also, dass die sich vorstellen können, was dort passiert."*

> to do with a market, then we will have the market office with us. Or MA28 if it's about street fairs."[13] – E2

During the on-site meeting, a negotiation protocol is drawn up in which all important guidelines and rules for the project are defined. After the negotiation is finished, a decision will be sent to the submitter. An additional fee for this submission as well as for the on-site negotiation must be paid (the price depends on the project and ranges from 50–100 €).

E3 indicated that the MA46 is primarily responsible for the approval of a parklet. A email with the information is sent to MA46. A sketch of the parklet and a photo of the street (where the proposed parklet would be) is sent to MA46. If the information is complete, the MA46 will invite the submitter to an on-site meeting with the MA48, the police, the district and the submitter. At this meeting, the submitter presents the project, and MA46 decides whether the parklet can be implemented. This process costs about 100 €.

E2 indicated that four magistrates are responsible for the submission of a project on the *Ermöglichungsflächen*. The MA28, governing road administration and road construction, is the land owner of the areas themselves. In addition, MA46 that governs traffic organization and technical traffic matters is responsible for traffic safety, MA42 that governs Vienna's city gardens is responsible for the maintenance of trees and water-bound surfaces; and MA19 is responsible for architecture and urban design.

Submission: Duration. E3 indicated that the submission of a project takes approximately six weeks from start to finish. The period from submission to the on-site meeting lasts approximately four weeks. After that, the issuing of the decision takes another two weeks. However, the duration of six weeks only applies if the submitted project complies with the guidelines of the City of Vienna.

Approval. Five experts were interviewed about the guidelines for projects that can be successfully submitted to the City of Vienna. E5 stated that "There is no document that says exactly what you can do and what you are not allowed to do. You learn that by experience. So it is difficult."[14]. Similar statements were made by the other experts. Experience makes it easier to submit a project to the City of Vienna. The planner/designer/researcher becomes acquainted with the guidelines and understands what is important. E3 stated that the *Grätzloase* helps to clarify how a project has to be implemented to be approved by the City of Vienna.

[13] Translated from German: *"Oft dabei ist die Polizei. Wenn viele Geschäfte in der Straße sind, dann wird auch wer von der Wirtschaftskammer eingeladen, oder Geschäftsstraßenverein oder sowas. Wenn's um irgendwas mit Markt geht, also wir haben schon einmal das Marktamt dabeigehabt. Oder MA28, wenns um die Straßenfeste geht."*

[14] Translated from German: *"Es gibt jetzt kein Dokument, wo ganz genau draufsteht: Was darf man? Was darf man nicht? Das weiß man, wenn man Erfahrungen hat. Somit ist das schwierig."*

Citizen Participation, Citizen Activation, Appropriation

One topic that was addressed in each interview was the participation, activation and appropriation of free spaces. E3 stated that projects that do not address people are difficult to understand and to accept. Projects in which people approach other people directly and motivate them to participate work best. As an example, E3 explained the following:

> "We now have a parklet again, and the woman responsible wants the neighborhood to be really activated. That means it will especially be successful if they [the neighborhood] are really addressed directly and asked, "Hey do you want to be there?" or "That day we will have breakfast in the neighborhood, and will you come by?" This personal contact is incredibly important."[15] – E3

E2 explained that when actions are carried out in the neighborhood "we always activate people in the neighborhood and talk to them."[16]. Furthermore, E2 and the people working with the expert, try to make residents aware of their actions and projects through newsletters, online posts and Facebook and thus motivate them to participate.

With regard to the *Ermöglichungsflächen*, E5 indicated that there must be an accompanying moderation because otherwise it would be difficult for the residents to become active. She also indicated that

> "it is definitely necessary for someone to say, "You may, you may not." Or, if you want to do that, you have to apply for permission because, although this is public space defined as an *Ermöglichungsfläche*, it is still very difficult."[17] – E5

E5 has performed evaluations of the *Ermöglichungsflächen*. One question discussed during the interview was whether residents would carry out a project in the areas themselves without additional help, and her answer was as follows:

> "Without any help it is not possible. This was an important focus of the evaluation. Someone has to communicate to people that this area is for that. It's not understood right now. If I go there and immediately recognize that

[15] Translated from German: *"Wir haben jetzt ein Parklet wieder und die Umsetzerinnen wollen, dass die Nachbarschaft wirklich aktiviert wird. Das heißt: Besonders erfolgreich ist es, wenn die wirklich direkt angesprochen werden und so fragen: "Hey möchtest du mit dabei sein?" oder "An dem Tag machen wir Nachbarschaftsfrühstück und komm doch vorbei". Und dieser persönliche Kontakt ist unglaublich wichtig."*

[16] Translated from German: "*sind wir immer aktivierend im Stadtteil unterwegs und reden die Leute dann auch an.*"

[17] Translated from German: *"es braucht auf jeden Fall jemanden, der sagt: "Das darfst du, das darfst du nicht." Oder wenn du das machen möchtest, musst du um Genehmigung ansuchen, weil es ist öffentlicher Raum, und es ist zwar als Ermöglichungsfläche definiert, aber es ist trotzdem ganz schwer."*

> this is an *Ermöglichungsfläche*, then I know what I am doing. The citizens should become familiar with this instrument in the coming years. Then they will implement that [projects or use the place] because they know that they are allowed to do that in the *Ermöglichungsflächen*."[18]. – E5

At present, the inhabitants of the Seestadt Aspern are not yet familiar with the instrument of *Ermöglichungsfläche*. Over the next few years, the residents are to be informed and supported in the appropriation of these areas. In the future residents should be highly familiar with the instrument and know exactly what is allowed in these areas.

E4 noted that the appropriation of space takes time. She explained this in more detail with the example of residential streets:

> "The goal would be for the neighbors to just go down and grab the table and be there themselves and network and do something and take over the space. That takes time. It doesn't happen overnight. These road traffic regulations have been in effect since 1983. Since then, no one has used the residential street, hardly anyone. I'm sure there are exceptions, where somebody goes down there and plays football or something, but for two years now we've been advertising and testing intensively. And now we're in the third year already. We now notice that there is change, but it takes time. What hasn't been seen for so long can't be made clear between today and tomorrow."[19] – E4

If people are not yet familiar with a new concept, those who are responsible have to show them what is allowed and what is not. The process of appropriation does not happen overnight. As E4 stated, in the third year people have begun taking the residential street and using it as a third place. E4 also stated that one must not approach people too aggressively. This scares residents off. E4 and her team set up an easel for new projects and let the residents read for themselves about the project and what is being done:

> "Giving information, explaining what is happening, providing moderation, even sign language translation and T-shirts that clearly show who the organizers are so it's easy to talk to them, that's what we like to avoid over time.

[18] Translated from German: *"Ganz ohne gehts nicht, weil das war ein großes Thema in der Evaluierung. Irgendjemand muss das den Menschen kommunizieren, dass diese Flächen dafür da sind. Das ist jetzt schon einmal nicht. Wenn ich dort hingeh und sofort erkenne, das ist eine Ermöglichungsfläche, da weiß ich, was ich mache. Dass es ein Instrument ist, das die Bürger und Bürgerinnen kennen. Soweit sollte es kommen in den nächsten Jahren. Dann setze ich das um, weil ich weiß, in den Ermöglichungsflächen darf ich das."*

[19] Translated from German: *"Das Ziel wäre, dass die Nachbarn einfach runtergehen und sich an Tisch schnappen und selbst da sein und sich vernetzen, und irgendetwas machen und den Raum einnehmen. Das dauert. Das geht nicht von heute auf morgen. Diese Straßenverkehrsordnung gibt seit 1983. Seither hat niemand die Wohnstraße benutzt, so gut wie niemand. Es gibt sicher Ausnahmen, wo irgendwer mal hinuntergeht und Fußball spielt oder so. [...] Aber seit zwei Jahren propagieren wir da intensiv und testen selber intensiv. Und jetzt das dritte Jahr schon. Und wir merken schon, dass da Veränderung gibt. Aber es dauert. Was so lange einfach nicht gesehen wurde, sieht man a nicht von heut auf morgen."*

> We have almost nothing left. We now use boards with a few things written on them, but that is it."[20]. – E4

In addition, she said that it is helpful if residents are allowed to simply observe at first, and then they will come ask about the project. The initiator of the project needs to be actively involved. This is how residents become aware of the projects and what is allowed in public space.

Participation & Technology. The topic of participation was also discussed in connection with the Smarticipate participation platform. The people involved in the development of the platform organize workshops to involve residents in the development process. E6 stated that

> "the workshops were always very well attended. In Hamburg it seems so anyway, there is a lot of interest in participation and also in the makeup of the participants. Not always the usual suspects [...] who are always in some meetings, but there were people from their early 20s to pensioners. All age groups were there and came from different parts of the city."[21] – E6

Furthermore, E6 stated that reaching out to different people and promoting active participation was important for the city of Hamburg. The city actively tried to activate the people and encourage them to participate in the development of the project. The residents were contacted by mail, and advertisements were placed in the newspaper. It was important for them not only to reach the digital natives but also those less familiar with new technology.

Another very important point in the development of the Smarticipate platform was the built-in data of the city, which provides the possibility to give users immediate feedback on their suggestions. E6 stated that

> "in Rome public gardens were planned in this way, where they say you have to have water nearby and there must be road access or a bicycle path nearby. Then it must be possible to provide an electricity connection because there are regulations requiring it."[22] – E6

[20]Translated from German: *"Informationen geben, was erklären. Moderation. Sogar Gebärdensprachenübersetzung. T-Shirts wo man erkennt, wer die Organisatoren sind, damit man gleich mit ihnen reden kann. Des haben wir alles lassen mit der Zeit. Wir haben so gut wie nix mehr. Schon so Tafeln, wo a bissl was steht. [...] Aber des wars dann."*

[21]Translated from German: *"Es war sehr gut besucht, immer die Workshops. In Hamburg ist es sowieso anscheinend so, da gibts sehr großes Interesse daran, aber auch die Struktur der Leute. Nicht immer die Usual Suspects [...] die immer in irgendwelchen Meetings drin sind. Sondern da waren von Anfang 20 jährige bis Pensionisten. Waren alle Altersstufen mit dabei und aus verschiedenen Stadtteilen."*

[22]Translated from German: *"in Rom waren öffentliche Gärten geplant, wo man sagt, man muss Wasser in der Nähe haben. Es muss Straßen-Anschluss oder ein Fahrradweg in der Nähe sein. Muss dann möglicherweise sein, dass ein Stromanschluss da ist, weil es irgendwelche Regelungen gibt dafür."*

These are some examples of feedback that can be provided by the platform. The user places an urban garden on the map and receives immediate feedback on whether an urban garden is possible at this location. This feedback is displayed directly in the platform,

> "and through that I can see on the one hand what the rules are in the city, and on the other hand I can see that the rules becoming more transparent (i.e., why certain decisions are made in the city)."[23] – E6

Furthermore, E6 stated that residents should be informed about the rules, but they should also be able to break them: "Know the rules and then break them." E6 explained this statement, saying that if 5000 citizens want something specific, but it is not possible according to the building regulations, then they should still be given the opportunity to communicate and exchange with the city. It should be possible for them to voice their opinion, and the regulations should be changed if necessary and possible. Smarticipate can be useful here because it tracks and displays the number of citizens who have participated, and in a case such as E6 described, the city could discuss and respond to this issue. E6 also indicated that feedback and active exchange of information is important. People need to be informed about the current status of projects. They need to feel that their opinions are heard and that they are evaluated according to the existing rules. This feedback can be provided directly through the platform or communicated to the residents through town hall meetings. There "must be a man or a woman or several people in the city who are there for the project, who like a hub take in the information"[24] and then communicate the decisions with the residents.

By making residents feel that their opinions are valued, active participation can be generated.

Ermöglichungsflächen

Another very important point in the interviews with the experts were the *Ermöglichungsflächen*. In order to implement a system for these areas, they needed to be better understood. The experts actively dealt with the design of the space, the activation of citizens and the participation of citizens. Therefore the *Ermöglichungsflächen* were discussed in five of six expert interviews.

According to E5, *Ermöglichungsflächen* are

> "areas in public space that deliberately belong to the public sector, are not private areas and are not semi-public areas, are deliberately kept free of design and are designed together with the people who will later move in,

[23] Translated from German: *"und darüber kann ich einerseits sehen: Was gibts für Regeln in der Stadt, und auf der anderen Seite kann jeder sehen, dass es transparenter wird d.h. warum bestimmte Entscheidungen in der Stadt getroffen werden."*

[24] Translated from German: *"muss es eine Stelle, also einen Mann oder eine Frau oder mehrere Leute geben, in der Stadt, die dezidiert für das Projekt da ist, die wie so ein Hub die Informationen aufnehmen."*

> depending on their needs. They have been defined as an instrument in the specialist concept of public space, which in newly developing urban districts, *Ermöglichungsflächen* are deliberately left free."[25] – E5

Furthermore, she stated that in Seestadt Aspern the district management was the contact partner in the preparation of the evaluation report. The urban district management is responsible "for the district work and for the involvement of the citizens. They also do a bit of moderation, but in principle it is all about creating identity with the help of district projects."[26] The district management did not take care of the *Ermöglichungsflächen* from the very beginning. It was only in the second year that they received the contract from the city and then took care of these areas. They also stated that there were too many areas available and that this caused resentment among the residents.

> "People don't know what to do with them [*Ermöglichungsflächen*] now. They rather create resentment, because they consist of this water-bound surfaces. These surfaces create a lot of dust on the ground-floor zones when they dry up and when there is wind."[27] – E5

The district management therefore takes care of these areas and tries to make people aware of them through district projects and to create a more positive feeling among the residents.

Corporate Identity. Corporate Identity (CI) was another topic that was discussed with expert E5. A CI denotes the totality of characteristics that distinguish one company from another. At present, *Ermöglichungsflächen* have no CI. During the evaluation of these areas it was found that the lack of CI is a problem. She stated that it is very important that the name should be established, as in the case of "Garteln ums Eck" or "Parklet". The same should happen when hearing or seeing the word *Ermöglichungsflächen*. The residents should know immediately which areas these are.

> "For a Viennese person to know: ah, this is a *Ermöglichungsfläche* or a *Möglichkeitszone*. This has also been discussed extensively with the experts

[25] Translated from German: *"Flächen im öffentlichen Raum, die ganz bewusst der öffentlichen Hand gehören, nicht private Flächen und keine teilöffentlichen Flächen sind, und die bewusst von Gestaltung freigehalten sind und gemeinsam mit den Leuten, die dann später hinziehen, entwickelt werden, gestaltet werden, je nachdem, welche Bedürfnisse es gibt. Sind eben als Instrument im Fachkonzept öffentlicher Raum definiert worden, dass man in neu zu entwickelnden Stadtteilen ganz bewusst Ermöglichungsflächen frei lässt."*

[26] Translated from German: *"für die Stadtteilarbeit und für die Einbindung der Bürger und Bürgerinnen. Ein bisschen Moderation machen sie auch, aber im Prinzip geht es darum, Identität zu schaffen mit Stadtteilprojekten."*

[27] Translated from German: *"Die Menschen wissen jetzt nicht, was sie damit machen sollen. Sie erzeugen eher Unmut, weil sie eine wassergebundenen Decken haben. Die im Sommer, wenn sie trocken sind und der Wind da ist, Schmutz in den Erdgeschosszonen erzeugen."*

> I spoke to – how to make it known. Once again, an additional sign makes no sense, and that is why we have started with this floor marking. But again, that is only something temporary. It definitely needs a name that's self-explanatory. A symbol, and the symbol should somehow be placed there. [...] Then when I walk through the urban space and see such a symbol, I should then automatically know: ah, that is where I am allowed to do that, and something could develop."[28] – E5

E5 indicated that the CI is a very important aspect when explaining the use of these areas to people. It should reach the point where people see the surfaces and automatically know what they can be used for, and that they can develop and design something there themselves. These surfaces should immediately convey to people that they can appropriate them. Therefore, floor markings were applied to clearly designate the *Möglichkeitszonen* in Essling.

E5 noted that it is becoming increasingly difficult to apply floor marking in urban areas. "Weak-sighted people might feel irritated if there are too many markings on the ground that they are unable to identify clearly."[29] In order to be allowed to mark the floor, the consent of the owner of the area must be obtained. In the case of the *Möglichkeitszonen* in Essling, these are "representatives or experts from the municipal department who own the land"[30].

Names for *Ermöglichungsflächen.* As discussed in Section 2.3.4, there are different names for the *Ermöglichungsflächen*. More names were identified during the expert interviews, and the first table with the various names was updated (see Table 6.1). The various names of the *Ermöglichungsflächen* were addressed during expert interviews 1, 2, and 5 with a view to establishing whether the name says something about the position of the areas and to facilitate further research by the author of this thesis.

E2 indicated that the areas are often called *Sandflächen* by the residents of Seestadt Aspern,

> "because they are just water-bound surfaces and in the beginning the wind has them – the wind often blows very strongly in the Seestadt. The wind blows sand into the ground floor apartments, and not only on the ground

[28] Translated from German: *"Damit ein Wiener und eine Wienerin wissen: ah das ist eine Ermöglichungsfläche oder eine Möglichkeitszone. Das ist auch stark diskutiert worden mit den Experten, mit denen ich gesprochen habe. Wie man das kenntlich macht? Noch einmal ein zusätzliches Schild macht keinen Sinn, und drum haben wir mit dieser Bodenmarkierungen begonnen. Das ist aber wieder nur etwas Temporäres. Es braucht definitiv einen Namen, der selbsterklärend ist. Ein Symbol, und das Symbol sollte irgendwie dort angebracht sein. [...] Dann gehe ich durch den Stadtraum, und sehe da ist eine, sollte ich dann automatisch auch wissen: ah das ist das, wo ich das machen darf und sich was entwickeln könnte."*

[29] Translated from German: *"Sehschwache Menschen könnten sich irritiert fühlen, wenn zu viele Markierungen am Boden sind und sie sie nicht eindeutig zuordnen können."*

[30] Translated from German: *"Referenten der Magistratsabteilung, die jeweils das Grundstück besitzen."*

> floor. They experienced this frequently in the apartments. That's why the residents call them *Sandflächen*."[31] – E2

Initially, these areas in Seestadt Aspern were called *Gestaltungszonen*. Subsequently the name *Tu-Zonen* (from doing, doing something) was chosen, and later the areas were renamed *Stadtstrand* by the residents of Seestadt Aspern (– E2).

In Essling, the *Möglichkeitszonen* were initially called Curiosity Zones. However, this name was too difficult to pronounce and therefore they were renamed *Möglichkeitszonen* (– E5).

The name itself says nothing about the position or type of the surfaces. Different names are used depending on who is responsible for motivating and encouraging the citizens to use the areas (– E5). In Seestadt Aspern these areas are currently called *Stadtstrand* (– E2), while in Essling they are called *Möglichkeitszone* (– E5). The names of these areas have been changed to make it easier for the residents to understand what the areas can be used for. All names that were found during the writing of this thesis are presented in Table 6.1.

Table 6.1: Updated table: Names and locations of Ermöglichungsflächen in the City of Vienna found during literature research and expert interviews

Location	**Name(s)**
Seestadt Aspern	*Ermöglichungsfläche, weiße Fläche, Gestaltungsfläche, Gestaltungszone, Stadtstrand, Möglichkeitszone Sandfläche, Tu-Zone*
Essling	*Möglichkeitszone*, Curiosity Zones
Danube Canal	*Ermöglichungsfläche*
Sonnwendviertel district	*Ermöglichungsfläche*

Possible Partners for Future Projects. The activation of people and the implementation of a project or technical system in public space requires a transdisciplinary approach. The search for project partners is therefore very important. During the interview, E4 mentioned certain possible project partners for future projects: district management, United in Cycling, the Seeseiten bookshop, the artist Briant Rokyta, Transition Base, and Wien 3420 aspern Development AG. In addition, E5 suggested the Greenhouse and *Baugruppen* as possible project partners.

[31] Translated from German: *"weil sie halt wassergebundene Decken sind, und am Anfang hat sie der Wind so - der Wind geht sehr oft und stark in der Seestadt, der hat sie oft verblasen und da hat sich im Erdgeschoss, nicht nur im Erdgeschoss. Sie haben es vielfach in den Wohnungen gehabt. Deshalb heißen sie bei den BewohnerInnen Sandflächen."*

Inspirations for Future Work and Development of the Prototype

During the expert interview, different suggestions for future projects were made with regard to the *Ermöglichungsflächen*.

During the interview with E4, it was pointed out that they – Space and Place - had developed a map showing all residential streets in the City of Vienna. They also created a residential street quiz. With the help of this quiz the residents can find out what they already know about Vienna's residential streets. Creating a quiz about the *Ermöglichungsflächen* was also suggested by E6.

> "What I've seen in projects from time to time is that you include quiz questions to introduce people to the topic. I think that's not a bad idea in such participation processes: that you let them know that they sometimes have a wrong or incorrect picture of some reality. Or that you want to lead them somewhere, so that they know about a problem and then bind them to it, even emotionally to some extent."[32] – E6

Expert E2 pointed out that there is the *Essbare Seestadt* research project, and that the implementation of raised beds on the land would be a good project. These beds could be taken care of by the residents. E1 proposed integrating multifunctional furniture into the areas, similar to the Enzis in the Museumsquartier.

E5 noted that a tool for networking the residents would bring added value to the acceptance and appropriation of these areas. Currently, communication works via a WhatsApp Group. She proposed that it should be something more motivating than an app – a digital tool, for example, that allows networking of residents. "Something that motivates, that networks. Digital networking is certainly essential there."[33].

Expert E6 shared his experience, and gave his opinion of what is important when creating a system.

> "From a purely technical point of view, it would make sense to move away from 2D map display, and actually do it in 3D. It just makes sense to prepare it so that it looks nice. That is always very important for people [...]. You have to take the trouble to prepare it in a way that it can be experienced and grasped by the citizen. [...] If you work together with the citizens, then you

[32] Translated from German: *"Was ich jetzt öfters mal in Projekten gesehen hab ist, dass man Quiz-Fragen einbindet, um Leute in das Thema einzuführen. Das finde ich in solchen Beteiligungs-Prozessen gar keine schlechte Idee. Dass man sie teilweise wirklich davon in Kenntnis setzt, dass sie manchmal sogar ein falsches oder nicht richtiges Bild von irgendeiner Realität haben. Oder dass man sie irgendwo hinführen möchte, dass sie über ein Problem Bescheid wissen, und sie dann darüber dran bindet, auch emotional ein bisschen."*

[33] Translated from German: *"Etwas, was motiviert, was vernetzt. Digitale Vernetzung ist da sicher ganz wesentlich."*

> have to put a lot of brain power into the presentation and think about icons, [...] ensuring that the presentation is not confusing and that the citizens see sense in what they are supposed to see. That it's not just some overloaded interface where you don't know where to look."[34] – E6

E6 also mentioned that it is important to inform the non digital natives and give them the opportunity to participate in the project. As a solution, he suggested that before each meeting with the citizens, an additional time should be planned so that everyone would be given the chance to participate. With the help of the responsible persons, the areas could be designed or the participants could give their opinion on the design proposals. This would make it easier to obtain the opinions of different population groups and age groups.

6.1.5 Conclusion

A total of six expert interviews were carried out. The development of a system in the public space is an interdisciplinary task and the expert interviews were conducted to gain a better insight into the different subject areas. The experts were selected on the basis of their research area and the projects they have implemented in the past.

Public space is becoming increasingly important. Many residents of Vienna do not have their own open space or green space and use public space as their third place. The transformation of public space and the adaptation of this space in accordance with the wishes of different people is therefore necessary. The street space of the City of Vienna is therefore being transformed into a social space. In order to make the public space more pleasant for the residents of the city, it should be green, embellished with water, provide shade, be clean, and offer a pleasant mixture of different people.

The submission of the project to the City of Vienna takes approximately six weeks. Organizations like the *Grätzloase* and *Lokale Agenda* support the city residents in submitting projects. Self-empowerment should be encouraged, and the residents should be able to actively participate in shaping the city. The project should be submitted directly to the responsible magistrate by mail. It will then be checked for correctness, feasibility, and compliance with the guidelines of the City of Vienna. All persons involved are invited to an on-site hearing and once everything has been clarified, the applicant will receive confirmation and the project can be implemented. The municipal authorities responsible for the *Ermöglichungsflächen* are MA28, MA46, MA42, and MA19.

[34] Translated from German: *"Rein technisch wäre es sinnvoll, dass man mittlerweile von 2D Kartendarstellung weggeht, dass man sagt, man macht eigentlich alles in 3D. Das halt sinnvoll aufbereiten, dass es schön aussieht. Das ist für die Leute auch immer ganz wichtig [...] Man muss sich da auch ein bisschen die Mühe machen, dass man es so aufbereitet, dass es für den Bürger auch erfahrbar und erfassbar ist. [...] Wenn man mit den Bürgern zusammenarbeitet, dann muss man sehr viel Gehirnschmalz in die Darstellung nochmal reinsetzen und sich Gedanken über Icons machen, [...] dass die Darstellung nicht verwirrend ist, und dass der Bürger einen Sinn darin sieht, was er da sehen soll. Das da nicht irgendwie ein überfrachtetes Interface ist, wo man nicht weiß, wohin man blicken soll."*

In order to involve the residents in projects, they must be actively approached. They must be animated and the residents must be made aware of the project. If they are not actively approached, it is very difficult to implement a successful project to motivate the neighborhood. To enable the appropriation of the *Ermöglichungsflächen*, the residents must be informed about the function and possibilities of these areas, otherwise it will be difficult for the residents to become actively involved. Furthermore, the appropriation of space needs time. This does not happen overnight. In the Space and Place project for residential streets, the appropriation of public space has taken over two years. In the third year the initiators recognized a change, and the residents knew what they are allowed to do on the residential streets. At the beginning, the residents have to be shown what they are allowed to do and what not. It is only once some time has passed and the project has been actively explained to them that a change and an appropriation can take place.

The active involvement of citizens can only happen if they are properly informed. They must be invited to participate in the projects, and it is particularly important for them to be fully informed about all decisions that are taken. They must understand the process and feel that their opinions are being considered. In the Smarticipate project, users are directly informed about the feasibility of their proposals. The city's policies are explained to the citizens and they are given the opportunity to submit their proposals, even though they may not comply with the guidelines of the city. In this way, an active exchange between all stakeholders is created and active participation and co-creation is encouraged.

Many residents of Vienna are not familiar with the *Ermöglichungsflächen* tool. The creation of a CI is therefore necessary. The CI helps people to understand the concept behind the instrument. When they see these areas they should immediately know what they are allowed to do in them there and what they can be used for – as is the case with the *Garteln ums Eck* and *Parklets*.

The expert interviews provided a valuable insight into the topic of public spaces, the City of Vienna, *Ermöglichungsflächen*, appropriation, participation, and co-creation; thus laying the foundation for answering the three research questions.

6.2 Observation

For this study, observations were made during the literature search and after some of the expert interviews were completed. The observations aimed to provide a better understanding of the context and the connections between people, place and technology by showing which people are using the *Ermöglichungsflächen* or the area nearby, which activities are performed and which technologies are used there. The observations should help to get more information about the areas themselves and the people living and working in the surrounding areas. Understanding the connections and the place is the basis for the development of a successful system in public space. The ethnographic approach from Menezes et al. [79] was used (see also Section 4.6.2 People, Place & Technology: An Ethnographic Approach).

6.2.1 Execution

The observations were made on two different days. The first observation served to collect data regarding the location of the areas at Seestadt Aspern, how they are structured, what occupies the adjacent areas and how the areas are equipped. This first observation was carried out on 24.01.2020 between 11:15 and 14:30. The temperature during this observation was about 0°C. At the beginning of the observation it was windy, and towards the end it was windy and started snowing. The second observation was carried out on 13.02.2020. During this observation it was about 7°C and sunny. The wind was not as strong as during the first observation. During the second observation, the *Ermöglichungsfläche* at Hannah-Arendt-Platz (in front of the restaurant Ö1 and the district management of Seestadt Aspern - *Ermöglichungsfläche 14*) and the area near the bus stop at Maria-Tusch-Straße 5 (*Ermöglichungsfläche 13*) were examined more closely. The numbering of the areas is discussed in more detail in the next section. These two areas were selected on the basis of an expert interview, which indicated they have already been partly used by the district management of the Seestadt Aspern. The aim of these observations was to find out more about the inhabitants of the *Seestadt Aspern*, including who the users are, how they use the space, when they use the space, which places they use and what the users do (and what artifacts they use) in the space. The observation of the area at Hannah-Arendt-Platz lasted from 10:50 a.m. to 12:00 p.m., and the observations at Maria-Tusch-Straße 5 lasted from 12:45 p.m. to 1:15 p.m.

Several more observations would have been planned; however, due to the Covid-19 pandemic in 2020, the further observations had to be canceled.

6.2.2 Results

This section summarizes the results of the two observations. The first part discusses the locations of the areas, the floor plans and the equipment of these areas. The second part presents the observations regarding the connection of people, place and technology.

Locations

In the planning of the new district Seestadt Aspern, *Ermöglichungsflächen* were planned at various locations. A total of 16 areas were planned and created. Two areas can be found along Sonnenallee, 11 areas along Maria-Tusch-Straße and three areas at Hannah-Arendt-Platz. The positions of the areas are marked in a Google Maps[35] satellite image in Figure 6.2. The *Ermöglichungsflächen* of the respective streets are marked with different colors and also numbered. Furthermore, the outlines, the size and the exact position of the areas are marked and visualized in Figure 6.3 (the colors and numbering used correspond to the color and numbering of Figure 6.2). For this figure the city map of Vienna[36] and ViennaGIS[37] were used.

[35] https://www.google.at/maps (last accessed on 2020-07-11)
[36] https://www.wien.gv.at/stadtplan/ (last accessed on 2020-07-11)
[37] https://www.wien.gv.at/viennagis/ (last accessed on 2020-07-11)

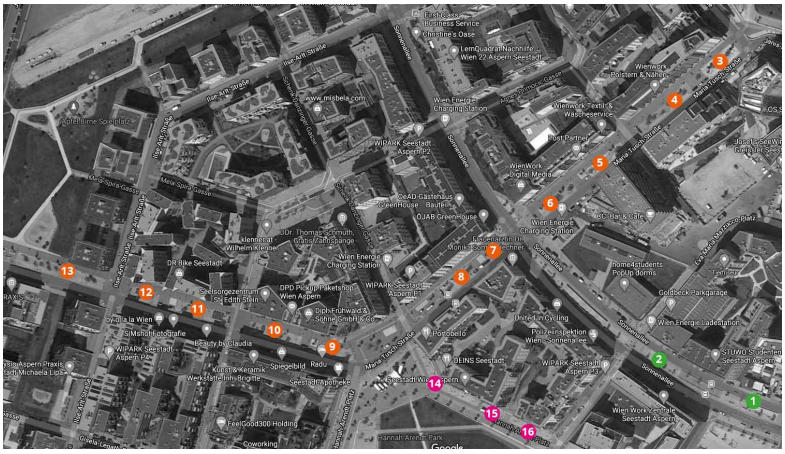
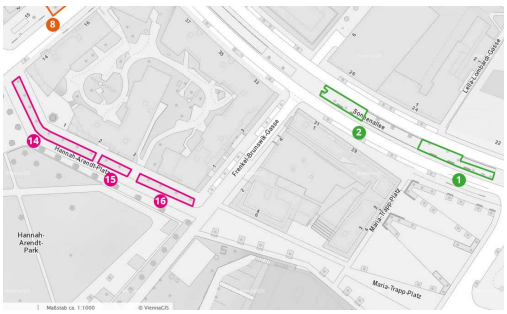


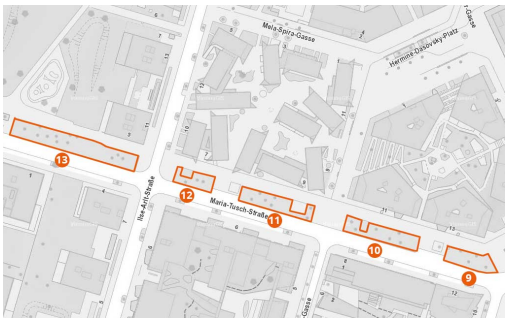
Figure 6.2: Screenshot of the Google Maps satellite image of a part of Seestadt Aspern. In addition, the Ermöglichungsflächen are marked and numbered.



(a) Sonnenallee (green, 1-2) and Hannah-Arendt-Platz (pink, 14-16)

(b) Maria-Tusch-Straße 21-35 (orange, 3-6)

(c) Maria-Tusch-Straße 11-21 (orange, 6-10)



(d) Maria-Tusch-Straße 5-13 (orange, 9-13)

Figure 6.3: Outlines of the Ermöglichungsflächen are marked in the map of ViennaGIS.

Basic Facilities

The *Ermöglichungsflächen* have been equipped with basic facilities. The areas are equipped differently; some have drinking facilities, some have red seating, others have

wooden and concrete seating.

Underground. A special floor consisting of a water-bound surface was used for all areas at Seestadt Aspern (see Figure 6.4a). This surface was used to facilitate the design of the areas and to make the residents aware that these areas are *Ermöglichungsflächen*.

Water Dispensers. Water dispensers were also installed on some areas. These can be used for watering the flowers or for drinking. Figure 6.4b shows a water dispenser.

(a) Underground *(b) Water dispenser*

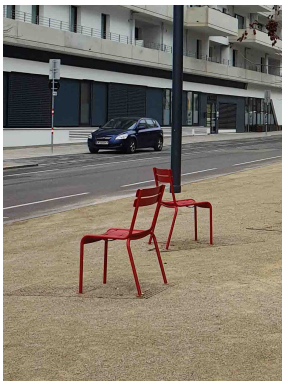
Figure 6.4: Basic facilities of Ermöglichungsflächen at Seestadt Aspern. The photos were taken on 2020-01-24.

(a) Trees *(b) Flower beds* *(c) Seating facilities and integrated vegetation*

Figure 6.5: Basic facilities of Ermöglichungsflächen at Seestast Aspern. The photos were taken on 2020-01-24.

Vegetation. A certain number of trees were planted in each area. These are to provide shade for the inhabitants, but at the moment the trees are too small to provide shade

(see Figure 6.5a). In addition, flower beds were planted in some areas. These are fenced off separately (see Figure 6.5b). Furthermore, small bushes and trees were integrated directly into the seating area (see Figure 6.5c).



(a) Red 1-person seating

(b) Red 2-person seating

(c) Seating facilities: concrete and wood

Figure 6.6: Basic facilities of Ermöglichungsflächen at Seestadt Aspern. The photos were taken on 2020-01-24.

Seating Facilities. The individual *Ermöglichungsflächen* have different seating options. Red one- and two-person seating has been placed in the areas at Maria-Tusch-Straße (see Figures 6.6a 6.6b). These seats look as if they can be moved, but they are fixed. Wooden and concrete seating was installed at the Sonnenallee (see Figure 6.6c). As previously mentioned in the "Vegetation" section, seating and greenery were combined (see Figure 6.5c). These combined seating variations are used at all three streets.

People, Place and Technology: Observation

The main task of this URM was to observe the people at Seestadt Aspern, find out what activities they performed in the vicinity of these areas and what technologies were used. During the first observation, the focus was on place – the areas themselves – and also on the connection between people, place and technology. The second observation focused primarily on the connection between the three.

Observation 1. During the first observation, the behavior of the people of Seestadt Aspern was observed. The number of people living, working and spending time in the vicinity of the areas varied greatly and depended on the position of the areas. Some areas are located directly next to restaurants, shopping facilities or bakeries, and in the vicinity of these areas some people spent time and performed the tasks of daily life. The vicinity of the Areas 5–10 and 14 were very well visited. The areas themselves were not used by the residents. Only two people walked around these areas with their dogs. It was also observed that people used the edge of the areas along Maria-Tusch-Straße as a

short parking zone. Along this street there are some shops, and while people were in the shops the areas were used for parking. In the vicinity of the areas that are a bit removed from the shops, restaurants and bakeries, few people were seen; these included the first and last areas on Maria-Tusch-Straße and Areas 15 and 16.

Observation 2. During the second observation, two different areas were observed. Since each place is unique and has a different location, the results are considered separately.

Ermöglichungsfläche 14. Next to this area there is a bus stop, restaurants, pubs, cafés and supermarkets. During the observation people did not use the area. On Maria-Tusch-Straße (bus stop Hannah-Arendt-Platz the bus line 84A) people waited for the bus, suppliers brought packages, visited the restaurants Portobello and Ö1 as well as the district management. The observation was made around noon, and it was possible to observe how people went out for lunch alone and in groups and later returned to their workplaces. Next to the areas is the Hannah-Arendt-Platz, which has a playground. Some people walked through the Hannah-Arendt-Platz and used the benches there or went directly to the playground. Some people also passed the area and came back with shopping bags from Spar or Libro. It could be observed that they performed their daily tasks. Furthermore, two groups could be observed taking pictures of the surroundings. They stopped again and again and looked at the surroundings. From the behavior of the group, it seemed they were taking a guided tour of the Seestadt Aspern. These people were between 30 and 60 years old. The people who spent time in the vicinity of this area were of different ages. Some people with children and strollers as well as older people were seen walking towards the park or doing their daily tasks. From about 11:30 a.m. onwards, people of working age were observed in the vicinity of the area. They bought a snack at the Spar or went out to eat. It was interesting that one person bought a coffee at Portobello and sat in the sun on the Hannah-Arendt-Platz. The bench on the *Ermöglichungsfläche* was not used (although it was also in the sun). Two other people sat down on the stairs between Leo - Café & Bakery and Bipa and spent their lunch break there (they ate and then left). During this observation people used mobile phones, cameras and a video camera.

Ermöglichungsfläche 13. This area is located directly next to the bus stop Johann-Kutschera-Gasse of bus line 84A, the Yella-Hertzka-Park and the dog area at the Yella-Hertzka-Park. During the observation, the whole area was in the shade, and it was very windy. The area was not used by anybody during the observation. During the observation, people waited at the bus stop and got off the bus. The people who were near this area were children, people with dogs, people with strollers and rather elderly people. The people who were near this area looked older than the people who were near the *Ermöglichungsfläche 14*. There were also fewer people near this area. During the observation people used mobile phones and headphones.

6.2.3 Conclusion

The observations offer preliminary insight into the context of use. In total two observations were made on different days. Further observations were planned, but due to the Covid-19 pandemic in 2020, no further observations could be made. A first step was made towards answering the questions of who the users are, how they use the space, when they use the space, which places they use and what they do in the spaces, and a better understanding of the inhabitants of the Seestadt Aspern and the *Ermöglichungsflächen* was gained. Different people are located in the vicinity of the spaces. They are of different ages and at different stages of life. The areas themselves were not used by a single person during the observations, but the use of the nearby surrounding areas and the activities conducted in the surroundings during the observation varied. Artifacts used during these two observations were mobile phones, cameras, video cameras and headphones. In order to answer the questions, further observations must be made. These should be carried out at different times of the day, on different days of the week and different seasons.

6.3 Online Survey

After the relevant literature was assessed and five of the expert interviews were conducted, questions for the online survey were created. This URM was chosen to reach a large number of people and thus gain better insight into the perception of public space held by the inhabitants of the City of Vienna. Furthermore, this URM should provide a better overview of what people want from public places and how these spaces can be designed so that people spend more time in them. The results should help to design the *Ermöglichungsflächen* or to identify ideas for future projects and events in these areas. In addition, the results of the survey form the basis for the interviews with the inhabitants of Seestadt Aspern.

6.3.1 Implementation

The survey consisted of open and closed questions. The open questions allowed the participant to express his or her opinion, and for these questions a text area was used. The closed questions facilitated the collection of quantitative data and consisted of multi-choice grids, multiple-choice questions and pick lists. More closed questions were used with the intention to avoid deterring participants. The aim was to receive as many fully completed surveys as possible. The survey was divided into five sections: Introduction, Demographic Data, Public Space, Ermöglichungsflächen and Closure. Depending on how the participant answered, different questions were displayed. People living in Seestadt Aspern saw different questions from other inhabitants of Vienna. Furthermore, people familiar with the Ermöglichungsflächen saw different questions than people who were not familiar with those areas. The different processes and questions are visualized in Figure 6.7 (the original German version can be found in the Appendix B).

The survey began with a short introduction explaining to the participants why it was

created. The introduction gave a short definition of public space and explained what data would be collected. Furthermore, it stated that the survey was created in cooperation with the TU Wien[38] and aspern.mobil LAB[39].

In the second section, the age and postcode of the place of residence were determined. Furthermore, it was clarified whether the participant lived in the Seestadt Aspern. These questions were asked in order to understand in which districts the participants lived and whether this was connected to a difference in their answers. In particular, it was important to distinguish between inhabitants of Seestadt Aspern and the other districts of Vienna.

The third section dealt with public space in the City of Vienna and in the Seestadt Aspern. Questions addressed issues such as how residents perceive public space, which characteristics are important to them, whether they feel comfortable in public space and in which places they feel comfortable. Furthermore, questions were asked about activities in public space and whether they prefer to carry them out alone or in company.

The fourth section dealt with the *Ermöglichungsflächen* at Seestadt Aspern. The aim was to gain an overview of how familiar the residents of Vienna are with the tool *Ermöglichungsflächen*. Furthermore, the questions assessed from where participants had received their information, under which name they know this tool, which activities they would like to carry out there and how these areas should be designed.

In the last sections, the residents were informed about the interviews with inhabitants of Seestadt Aspern. They could state if they were interested in participating and leave their name and email address. Furthermore, they could enter their name and email address to receive the results of the survey they had just completed.

6.3.2 Execution

During the literature review and the execution of the expert interviews, questions were collected that would be important to answering the research questions and that could be asked in the survey. The survey was written in German, and the first version was created using Microsoft Word[40]. The paper survey was tested with two test subjects in order to assess whether the questions could be answered, what the duration of the survey would be, whether the grammar and expression were appropriate and whether the questions and the possible answers were understandable. The original plan was to distribute this survey directly to the inhabitants of the Seestadt Aspern and to talk to them in person. Due to the Covid-19 pandemic in 2020, the paper survey was converted into an online survey. In a next step, an online survey was created with the help of Google Survey[41].

During this creation, the first survey was slightly modified. After completion of the online survey, it was pilot tested.

[38] https://www.tuwien.at/ (last accessed on 2020-05-11)
[39] https://www.mobillab.wien/ (last accessed on 2020-05-11)
[40] https://products.office.com/de-at/word (last accessed on 2020-06-09)
[41] https://surveys.google.com (last accessed on 2020-06-09)

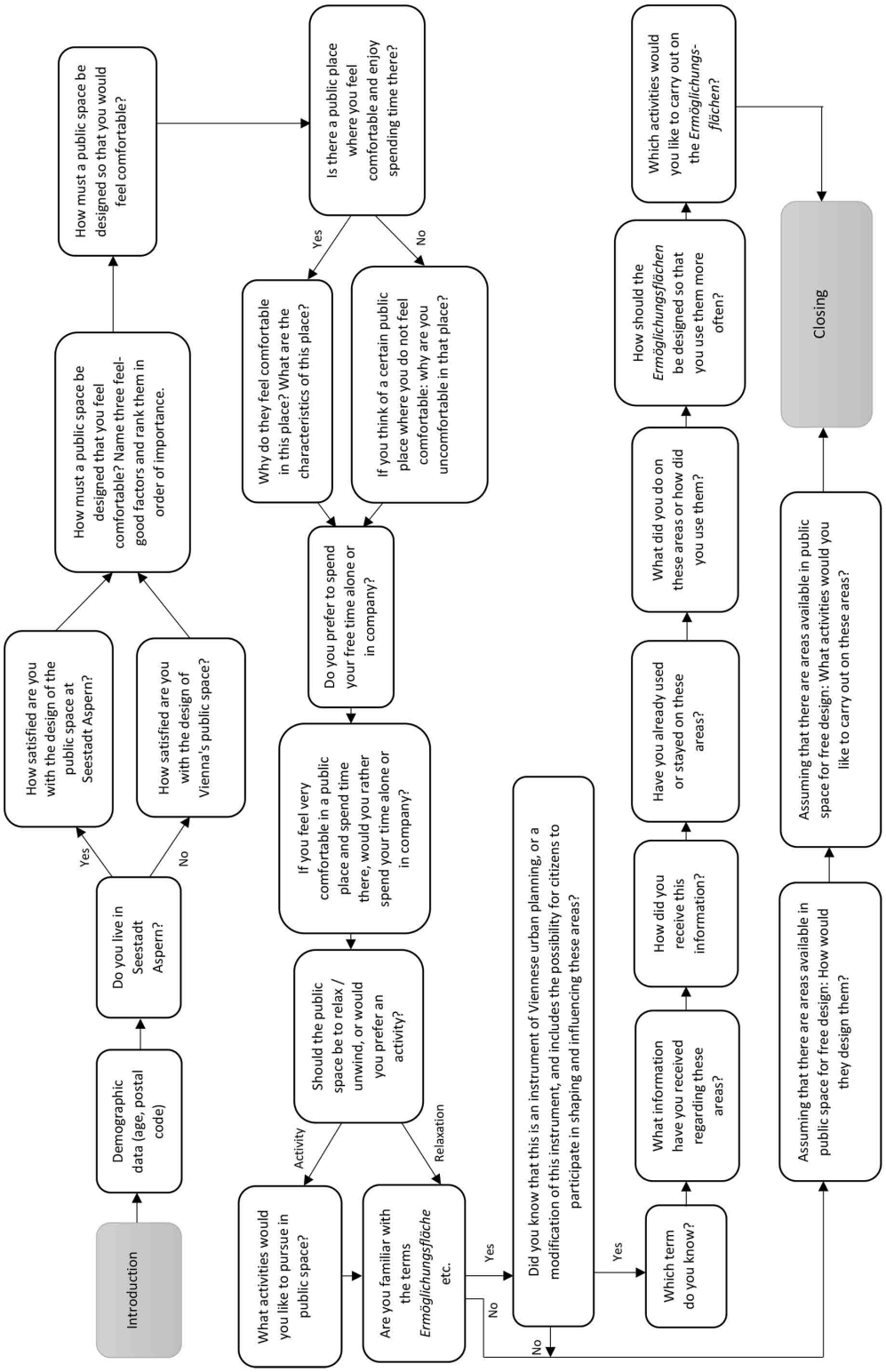


Figure 6.7: Order of questions of the online survey. Translated version.

Pilot Testing

Before the test subjects tried the online survey, the author of this work completed the online survey several times. Afterwards, three people were invited for a pilot test. The pilot test subjects received the link for the survey by email and were asked to perform the test. As in the first iteration, the people were asked to test the online survey and to check whether the questions could be answered, what the duration of the survey was, whether grammar and expression were appropriate and if the questions and the answer options were understandable. Furthermore, they were asked to simulate different test subjects, for example, to simulate the role of a person living in the Seestadt Aspern and a person living in Vienna. In total, the survey was tested about 20 times. This was necessary in order to ensure that all questions were checked and that the linking of the questions was correct.

The survey was online from 10.04.2020 at 17:30 to 11.05.2020 at 12:06. It was posted on different platforms such as Facebook (Facebook groups (TU Wien-Informatik und Wirtschaftsinformatik, Informatik/Wirtschaftsinformatik TU Wien, Seestadt Aspern, Universität wien) as well as on the authors Facebook page), Slack (Channel for master students of Media and Human-Centered Computing) and aspern.mobil LAB (on the Facebook page as well as on the official homepage). Furthermore, the survey was sent to friends of the author, and they were asked to share the survey with people living in the City of Vienna. The survey could be completed on computers, tablets or smartphones.

On 11.04.2020 at 11:20 a question was adjusted. A further question was added to verify whether the participants were familiar with the terms given in connection with the instrument developed by the city planning department. Prior to this adjustment, 21 people had completed the survey.

6.3.3 Data Analysis

For the quantitative analysis, the data were exported to an Excel file and evaluated using Microsoft Excel[42]. Each individual question was considered and the results summarized. To visualize the results of this analysis, charts were created. The qualitative analysis was performed with MAXQDA[43]. The program was used to code and analyze the free text questions of the survey. Word Clouds[44] were created to better visualize the results of the qualitative data.

6.3.4 Results

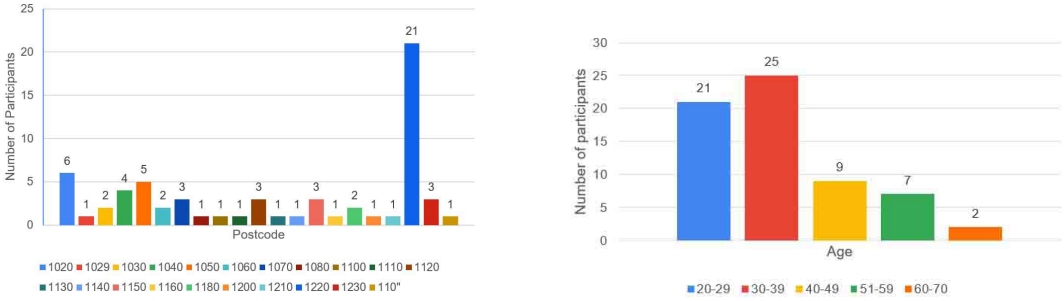
In the following section, the responses to the survey are analyzed quantitatively through statistical analysis as well as qualitatively through thematic analysis. The qualitative analysis evaluates the responses to the free text responses, except for the demographic

[42] https://www.microsoft.com/de-de/microsoft-365/excel (last accessed on 2020-05-25)
[43] https://www.maxqda.de/ last accessed on 2020-06-02
[44] https://www.jasondavies.com/wordcloud/ (last accessed on 2020-05-25)

data and the final section. The remaining answer options (i.e., multi-choice grids, multiple-choice questions and pick lists) are evaluated in the quantitative analysis.

Quantitative Data

The analysis of the results starts with the quantitative data collected. All questions that did not include free text are considered and presented here. These questions were created to provide an overview of the perception that inhabitants of the City of Vienna have regarding public space. The results are summarized below.



(a) Postcodes of participants *(b) Age of participants*

Figure 6.8: Survey results - demographic data

Demographic Data: Participants. A total of 69 people completed the survey in full. Of these, 5 participants did not live in the City of Vienna; these responses were not evaluated, and therefore, 64 answers remained for the analysis. One person indicated currently living in district 1029 and another indicated living in 110". We assumed that these were typing errors, and therefore, the answers of these participants were included in the analysis. In total, people from 19 different districts of the City of Vienna participated in the survey. The number of participants by district is visualized in Figure 6.8a. Twenty-one people stated that they lived in the district Donaustadt (postcode 1220). These people also lived in Seestadt Aspern; therefore 21 participants (32.81%) lived in Seestadt Aspern and 43 (67.19%) in other districts of Vienna. The youngest person who took part in the survey was 20 years old, and the oldest was 63. The average age of all participants was 36 years, and 45 years was the average age of participants who lived in Seestadt Aspern. Figure 6.8b visualizes the number of participants in different age groups.

Satisfaction - Public Space Vienna. The first question of the survey addressed the satisfaction of the inhabitants of Vienna. In the following, the answers are divided into three results: people living in Vienna; people living in Vienna, excluding the residents of the Seestadt Aspern; and people living in Seestadt Aspern. This subdivision was made in order to evaluate whether there was a difference in satisfaction related to the design of the public space between the districts and especially between the district Donaustadt and the other districts.

The average value for satisfaction for the whole city was 3.27 out of 5 possible points. Seven people (10.94%) stated that they were very satisfied with the design of the public space, 22 people (34.38%) were satisfied, 18 (28.13%) were neither satisfied nor dissatisfied, 13 people (20.31%) were less satisfied, and 3 people (4.69%) were not satisfied with the design. One person (1.56%) did not want to answer that question or could not answer it. Figure 6.9a visualizes this result.

In comparison, the satisfaction of inhabitants excluding those of Seestadt Aspern (i.e. inhabitants of the district Donaustadt, postcode 1220), the average satisfaction was 2.64. Six people (13.95%) were very satisfied, 16 (37.21%) satisfied, 10 (28.13%) neither satisfied nor dissatisfied, 9 (20.93%) less satisfied and 1 person (2.33%) was not satisfied. One person (2.33%) did not want to answer that question or could not answer it. These results are visualized in Figure 6.9b.

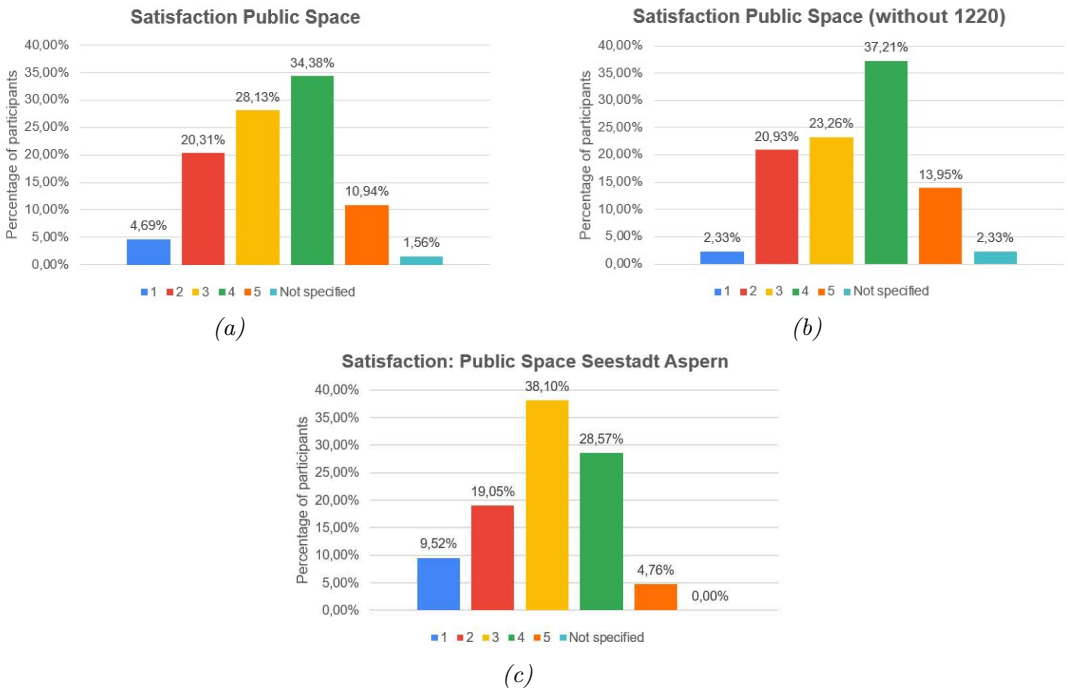


Figure 6.9: Visualization of the level of satisfaction with the design of public space in the City of Vienna (1: not satisfied; 5: very satisfied).

The average value for satisfaction of the inhabitants of Seestadt Aspern was 3.00. One person (4.76%) stated that he/she was very satisfied with the design of the public space, 6 people (28.57%) were satisfied, 8 (38.10%) were neither satisfied nor dissatisfied, 4 (19.05%) were less satisfied and 2 people (9.52%) were not satisfied with the design. Figure 6.9c visualizes these results.

Feel-Good Factors and Feeling Comfortable in Public Space. The next survey questions were designed to assess whether the inhabitants felt comfortable in

a any place in the City of Vienna and which factors they considered important to feel comfortable in a public space. Sixty-one people (95.31%) stated that there was a public place where they felt comfortable. Three people (4.69%) did not feel comfortable anywhere in the City of Vienna. Furthermore, the participants were asked to rate a list of terms. The aim was to identify where the priorities of the inhabitants of the City of Vienna lie. Table 6.2 ranks the terms according to the average value of importance of the individual factor.

Table 6.2: Ranking of the average value of importance of the individual factor. Each bullet point consists of the provided factor and the average value of importance of this factor.

Ranking	**Factor**	**Average Value**
1	With nature/plants/trees	4.30
2	With seating	4.03
3	Clean	3.77
4	Shade-giving	3.72
5	Should convey a feeling of security	3.70
6	Quiet	3.30
7	Sunny	3.20
8	Good view	3.08
9	Public toilet	3.06
10	Possibility of Interaction and Communication with other people	2.98
11	Consumption possibility (drinks, food)	2.80
12	Secluded	2.56
13	Viewable from all sides	2.45
14	One-sided visual protection	2.36
15	Multi-sided visual protection	2.31

It can be seen that green spaces, trees, plants, seating and the ability to sit in the shade are among the three most important features. Of course, this statement cannot be generalized, since these terms were provided.

Activities in Public Space. The next part of the survey was designed to find out whether people prefer to spend their time alone or in company and what activities they like to do in their free time. Five (7.81%) of the people interviewed said that they preferred to spend their free time alone. Sixteen people (25%) preferred to spend their free time in company, and 43 people (67.19%) preferred both. When asked if they preferred to spend their free time alone or with company in a public space where they feel comfortable, 6 people (9.38%) preferred to spend their time alone, 19 people (29.69%) preferred company and 39 people (60.94%) preferred both.

Furthermore, the participants were asked whether the public space should be for relaxation or for carrying out an activity, and 20 people (31.25%) indicated that it should be for relaxation, 41 people (64.06%) said it should be for carrying out an activity and 3 people (4.69%) would like to have the opportunity to do both. Forty-four people, that is to

say all people except those who just wanted to relax, received a list of activities. They were instructed to choose from a list of 11 activities which ones they would want to carry out in public space. Additionally, a free text response could be entered ("Other"). Multiple selections were possible. Thirty-three people wanted to eat or drink something with others, 33 people would like to relax in public space, 31 people wanted to do sports, 27 people indicated that they would like to watch a film, 19 people would like to use a playground, 18 people would like to create a *Grätzloase*, 16 people wanted to cook or bake together, watch art or create art themselves or do "Garteln ums Eck", 14 people would like to play community games, 10 people would like to have a fitness station in public space and 6 people used the free text field to suggest another activity. These results are visualized in Figure 6.10.

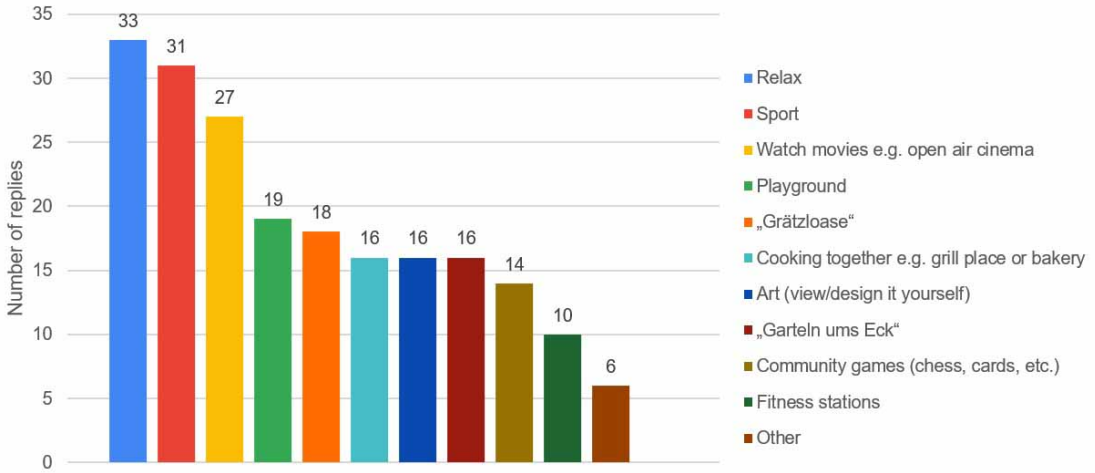


Figure 6.10: Survey result: this figure visualizes the number of answers for each of the 11 activities given.

Ermöglichungsflächen. One part of the survey addressed the *Ermöglichungsflächen* of Seestadt Aspern. The aim was to find out how many people knew about these areas. Before the survey was changed (see Section 6.3.2 Execution last section), 21 out of 64 (32,81%) participants had completed the survey, and 12 (57,14%) of them stated that they knew one of the terms *Ermöglichungsfläche / Gestaltungsfläche / Stadtstrand / Sandfläche / Möglichkeitszone / Gestaltungszone*. Nine people (42.86%) stated that they did not know any of those terms. After the survey was modified and the first question was clarified, 26 out of 44 people (59.09%) stated that they knew one of the terms, and 18 people (40.91%) did not know these terms. After the follow-up question explained that the terms are part of a new instrument of the City of Vienna, the answers of 7 people (26.92%) were changed to "no"; in other words, of the 44 people, 19 people (73.08%) knew and 7 people (26.92%) did not know the terms in connection with the instrument *Ermöglichungsflächen*.

The participants were then asked which terms they had heard before. Overall there

were 104 answers to this question. A multiple selection was possible. Twenty-six people stated that they had heard the term *Stadtstrand*, 19 people the term *Gestaltungszonen*, 17 people the term *Sandflächen*, 19 people the term *Gestaltungszonen*, 12 people the term *Ermöglichungsflächen* and 11 people the term *Möglichkeitszonen* in connection with the tool *Ermöglichungsfläche*. The results of this question are visualized in 6.11a.

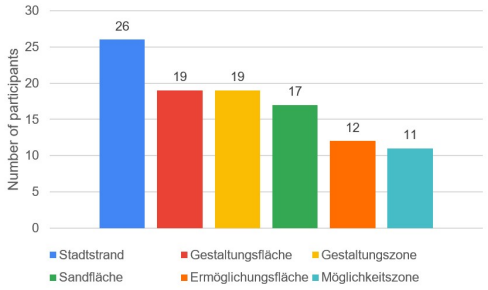
Participants were also asked what information they had received about the *Ermöglichungsfläche*. Overall, there were 50 answers to this question. Multiple selection was possible. Fourteen people reported that they had been informed about the possible uses of the areas, 12 people were informed about the locations of the areas, 9 about events and 10 people did not receive any information about the areas. The results of this question are visualized in Figure 6.11b. Furthermore, the five following answers were entered in the free text field by one person each: "know the *Ermöglichungsflächen* through a survey"[45], "planning aspects"[46], "that it is unclear what one may do with the *Stadtstrand*, so citizens may participate but one does not know what it may look like"[47], "in the course of an event for greening the Seestadt Aspern"[48] and the "idea behind it"[49].

Another question was asked to find out how the participants got the information about the *Ermöglichungsflächen*. A total of 47 answers were given. It was possible to select multiple information sources. Ten people indicated that they had not received any information, 14 people received the information from the district management, 6 people via the aspern.mobil LAB, 4 each via the newsletter and the Facebook group of Seestadt Aspern and 9 people answered using the free text. The free text answers indicated that participants had received information in their studies, from the University of Natural Resources and Applied Life Sciences, from Facebook groups in general, through a professional network, from MA 19, *Essbare Seestadt*, from an event on greening of Seestadt Aspern and from the master plan. One person stated in addition that she received the information from the Vienna architects and planners. The results of this survey are visualized in Figure 6.11c. Nineteen people stated that they had used the *Ermöglichungsflächen*, and 12 people had not used the areas at any time.

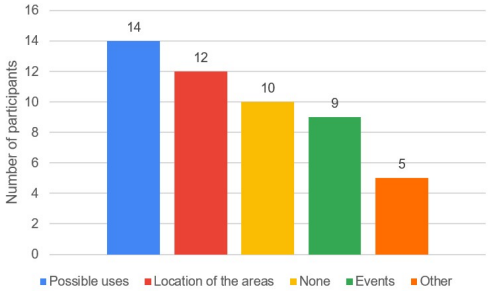
Qualitative Data

In contrast to the quantitative analysis, the qualitative analysis assessed the content of the free text areas. The focus was not on the number of statements, but on what people answered freely and what their opinions were on the topic. The free text questions should provide deeper insight into the wishes and opinions of the inhabitants of Vienna. The aim was to identify what characteristics a good public space should have and what residents need to feel comfortable in it. Furthermore, the results should provide better insight

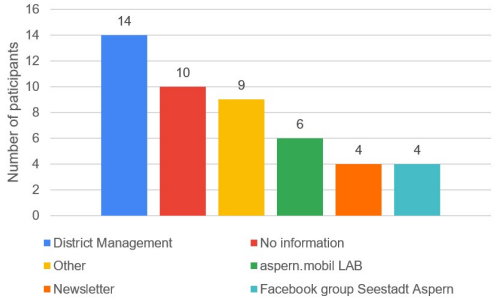
[45] Translated from German: *"Wurden in Umfragen genannt"*
[46] Translated from German: "*planerische Aspekte*"
[47] Translated from German: "*dass es unklar ist was man mit dem Stadtstrand machen darf, also Bürger dürfen sich beteiligen aber man weiss nicht wie die aussehen darf*"
[48] Translated from German: "*im Zuge einer Veranstaltung zur Begrünung der Seestadt*"
[49] Translated from German: "*Idee dahinter*"



(a) The different terms for the tool Ermöglichungsflächen



(b) This Figure visualizes which information the participants have received.



(c) Information sources for Ermöglichungsflächen

Figure 6.11: Survey results: Ermöglichungsflächen

into the wishes and suggestions about the *Ermöglichungsflächen* of Seestadt Aspern. All questions were analyzed and divided into the subject areas that are summarized below.

The Top Three Feel-Good Factors. The participants were asked about the three most important factors that make up a good public space for them. By far the most important factor reported was the greening of the city. A variety of greenery is of great importance to the citizens of Vienna. Not only plants or grass but also flowers and trees should be used. A balanced variety of plants should be used in public spaces. The advantages of greenery can be used strategically like the "natural shade"[50] of a tree and the "absorption of sound"[51]. A total of 56 people chose this characteristic among the top three factors.

The second most frequently chosen feature was seating. This answer was given a total of 16 times, but was not specified in more detail by most participants. It was only stated that "seating options"[52] or "seating arrangements"[53] were among their top three factors.

[50] Translated from German: "*am wichtigsten: Pflanzen*"
[51] Translated from German: "*z Schall schlucken*"
[52] Translated from German: "*Sitzmöglichkeiten*"
[53] Translated from German: "*Sitzgelegneheiten*"

Figure 6.12: This word cloud was created from the answers to the feel-good factors of the residents of the City of Vienna.

Other participants indicated that they would like "more benches", "comfortable seating" and "multiple seating (outside of benches)"[54].

The third most frequently mentioned factor was space. People want "enough space"[55]. The open space should be "roomy"[56], and there should be enough "room to move around"[57]. The free space should be designed in such a way that "no physical contact with others/foreign people"[58] is created. "Open", "not too crowded" and "spacious areas"[59] are favored by the inhabitants of the City of Vienna. This factor was mentioned by a total of 12 people.

Figure 6.12 visualizes the different answers of the participants regarding their top three feel-good factors in public space.

Another part of the survey dealt with wishes for the future design of public space as well as with opinion on the current design of public space. These text questions were divided

[54]Translated from German: *"mehr Bänke", "bequeme Sitzmöglichkeiten" und "vielfältige Sitzgelegenheiten (außerhalb von Bänken)"*
[55]Translated from German: "*genug Platz*"
[56]Translated from German: "*geräumig*"
[57]Translated from German: "*Raum zum Ausweichen*"
[58]Translated from German: '*'kein Körperkontakt zu anderen/fremden Person*"
[59]Translated from German: *"offen", "nicht zu überlaufen", "Weitläufigkeit"*

into five topics. Sn section 6.3.4, we found that the inhabitants of Vienna were satisfied with the design of the public space, an average value of 3.27 out of a possible 5 points was awarded. On this scale, 5 indicated that the residents were very satisfied and had no unfulfilled wishes. The following sections gives an overview of the wishes for changes expressed by the residents of the City of Vienna and their reported opinions about the design of public space.

Vegetation, Sealed Surfaces & Water Sources. If the inhabitants of the City of Vienna were to decide on the design of public space, then greenery would the most important focus. As with the three feel-good factors, greenery was one of the most important factors in the reported wishes of the residents. The use of trees as shade providers was mentioned several times. Trees offer natural and pleasant shade, but they should be a certain size. Many trees do not offer shade due to their small size, and even when planting new trees, different sizes should be used. Trees should not only be planted in parks, but also in the whole urban area. For example, the streets should be decorated and supplemented with green strips, trees, flowers, small gardens and so on. Green spaces can reduce dust and contribute positively to the climate. The use of green spaces can counteract urban heat and reduce the number of people moving out of the city.

The participants reported that it is very positively received that in many new building projects more nature is being included in the planning, and this theme is being brought into the focus of the design. Natural space brings enormous added value. Depending on the districts and the inhabitants, the lack of greenery is perceived as negative, and this was often a decisive point in the evaluation of the current design of public space. Many districts of the City of Vienna have a good balance between green and sealed areas (e.g., asphalt, cement, cobblestone), and this is perceived positively by the residents. Not all residents perceive the existing green spaces as insufficient. However, a large proportion of residents stated that they would like "many trees", "much green", "natural shading", "much nature" and "many green spaces"[60] and that this would be the main focus if they were to design the public space themselves.

As in the case of greening, the balance between green and sealed or concreted areas is perceived as positive, but the majority of citizens want fewer sealed areas. A good balance between these areas should be found in order to increase the satisfaction of the residents.

Water features such as fountains, lakes and ponds are also considered important by the city's inhabitants. Water features offer a cooling effect in summer and help hot days to be perceived as more pleasant. Furthermore, these water features offer a pleasant view. In addition, drinking water stations should not be missing in a good public place. The water should be provided free of charge.

[60] Translated from German: "*viele Bäume*", "*viel grün*", "*natürliche Beschattung*", "*viel Natur*" und "*viele Grünflächen*"

Infrastructure. For many citizens, it is important that public space is well connected to the public transport network. The ideal place should be within walking distance of subways or other public transport; it should be easily accessible and not too far outside the city.

Public toilets should also be available. These should be accessible to all people, including disabled people and parents with children. Also the changing of a baby should be possible without any problems.

The option to consume something should be available. The residents would like to be able to decide whether to buy a snack, coffee, ice cream or other food or to consume food and drinks they have brought with them. For many people a public place is only worth visiting if there are good bars, restaurants and coffee houses nearby. For others, it would be enough if small snacks such as sandwiches or coffee could be purchased.

Mobility. The wish of many residents is for a more traffic-calmed[61] city, as well as a city with "minimal car traffic"[62]. If there is too much traffic, the public space is perceived more negatively, and people spend less time there. A good public space should not have a heavily trafficked street leading directly past it. The open space should accommodate all traffic participants, including pedestrians, cyclists, car drivers and scooter drivers alike.

The inhabitants of Seestadt Aspern reported that they find the amount of traffic very pleasant. There are few cars and the streets are very wide. There is enough space for all road users. In particular, the pavement is very wide, and pedestrians can move around without difficulty. In other districts, the traffic and the division of the area is not perceived so positively. Residents want less motorized traffic and more cycle paths.

Design, Arrangement and Features of Public Space. In this topic area, the different design, arrangement and feature wishes of the residents are summarized. This section makes clear how high the demands on a good public space are and how difficult it is to satisfy all people with the design of the public space. As previously mentioned in the discussion of the three feel-good factors, the residents of the City of Vienna want a large amount of free space. The public space offer enough space for everyone. An open design is preferred by many residents. This not only includes the design but also means the space should be accessible to everyone (no privatization of public space).

Furthermore, the public space should not only offer enough room to sit and linger but should also be versatile in its use. The open space should be designed for families, singles and groups. There should be places that can be used by parents and their children. This includes playgrounds as well as places with enough seating for parents to keep an eye on their children. In addition, the public space should provide space for exercise, entertainment and activities. Above all, many residents want the opportunity to interact and communicate with other residents. A good public place should promote this by

[61] Translated from German: "*verkehrsberuhigt*"
[62] Translated from German: "*minimaler Autoverkehr*"

offering the possibility to meet people. It should also be possible to observe the urban activity. Many people would like to be in the crowd but do not want to interact directly with the surroundings. There should be "bustle but it should not be overcrowded"[63].

The public space should convey a sense of security and be neat and clean. Cleanliness is highly appreciated by the inhabitants of the City of Vienna and is essential for satisfaction with a public space. There should be enough places in the shade, but there should also be places in the sun.

Many residents want a nice view while they are in public space. Most residents did not further specify this statement, but some described the view of a lake and beautiful architecture as a desirable view.

As mentioned in the three feel-good factors, seating is a very important part of the public space. Many residents would like more seating. These should also be more varied seating that offers the invitation to stay. Coziness is the top priority here. Furthermore, there should be more than just conventional seating options such as benches, because people would like to choose between different variants. It should be possible to sit on the ground or in the grass, removed from the bustle and also in the middle of the action. Furthermore, seating should be planned for individuals and also for groups and families. The public space should give the feeling of an expanding living room.

Ermöglichungsflächen. In this topic area, we take a closer look at the *Ermöglichungsflächen* of Seestadt Aspern.

The citizens indicated that these areas are currently perceived rather negatively. They should be designed with more trees, plants and flowers. Another reason for the negative appearance of the areas is the water-bound sand surface. The inhabitants feel very disturbed by this sand. Furthermore, the inhabitants of Seestadt Aspern were asked what they had done in the areas or for what activities they had used them. It was reported that they had attended events at the sites, used them for relaxation and recreation and visited exhibitions. They would like to see these areas designed in such a way that they can be used for relaxation and recreation. Furthermore, it would be nice if a parkour course could be set up near the bus stop to shorten the waiting time for the bus. It would also be nice to have a small garden and to share and maintain it with the neighbors.

Some of the favorite places reported by residents were the Wienerberg, Schweizer Garten, Stadtpark, Rochusmarkt, Rathausplatz, Maria-Theresienwiese-Kaserne, Palais Auersperg, Lainzer Tiergarten, Karlsplatz, Wientalerstraße, Hannah-Arendt-Platz, Donausinsel, Augartenspitz and Himmelhofwiese.

[63] Translated from German: "*es herrscht reges Treiben aber keine Überfüllung*"

6.3.5 Conclusion

This URM was chosen to reach a large number of people and thus gain a better insight into the perception of public space held by the residents of the City of Vienna. Furthermore, this URM should provide a better overview of what people want from public places and how these spaces can be designed so that people spend more time in them. Both qualitative and quantitative data were collected.

A total of 64 persons participated in the survey, 21 of whom live in Seestadt Aspern. The average value for satisfaction with public space for all participants was 3.27 out of 5 possible points. By contrast, the average satisfaction of residents excluding those of Seestadt Aspern (i.e., residents of the district Donaustadt, postcode 1220) was 2.64. The average value for satisfaction of the residents of Seestadt Aspern was 3.00.

Sixty-one people (95.31%) stated that there was a public place where they felt comfortable. Three people (4.69%) did not feel comfortable anywhere in the City of Vienna. In addition, the participants were asked to rate a list of terms. The aim was to identify where the priorities of the residents of the City of Vienna lie. Trees, plants, seating, and the ability to sit in the shade are among the top features mentioned.

Six (9.38%) of the people interviewed said that they preferred to spend their free time alone. Nineteen people (29.69%) preferred to spend their free time in the company of others, while 39 people (60.94%) preferred both. Twenty people (31.25%) indicated that public space should be for relaxation, 41 people (64.06%) said it should be for carrying out an activity, and 3 people (4.69%) stated they would like to have the opportunity to do both.

The participants received information about the *Ermöglichungsflächen* via the district management, aspern.mobil LAB, newsletter and the Facebook group of Seestadt Aspern. Ten people indicated that they had not received any information.

The participants were asked about what they regarded as the three most important factors that make up a good public space. By far the most important factor reported was the greening of the city. The trees should be large enough to provide natural shade. Furthermore, a balance between green and sealed or concreted areas should be found in order to increase the satisfaction of the residents. The second most frequently chosen feature was seating. Seating is a very important part of the public space. Many residents would like more seating. The seating should also be more varied and inviting. Coziness is the top priority here. The third most frequently mentioned factor was space. People want enough space. The public space should be designed in such a way that it is accessible to everyone (no privatization of public space). Moreover, the public space should not only offer enough room to sit and linger, but should also be versatile in its use. The public space should convey a sense of security and be neat and clean.

The citizens of Seestadt Aspern indicated that *Ermöglichungsflächen* are currently perceived rather negatively. They should be designed with more trees, plants and flowers. Another reason for the negative appearance of the areas is the water-bound sand surface.

The residents feel very disturbed by this sand, and would like to see these areas designed in such a way that they can be used for relaxation and recreation.

The information obtained from this survey gives a first insight into the wishes of the residents of the City of Vienna. In order to implement a successful system in public space, one has to get to know the user, in this case the residents of the City of Vienna and especially the residents of Seestadt Aspern.

6.4 Interviews

The purpose of this interview was to provide insight into the opinions of the inhabitants of the City of Vienna. After the first evaluation, the hypothesis was formed that the inhabitants of the city must already be active in their district or in the city in order to use this app (which is developed during this thesis) and find it helpful. The interviews with the residents were intended to refute or verify this hypothesis. Furthermore, the use of technology such as smartphones and interactive displays in public spaces was identified as a topic to be examined in more detail.

6.4.1 Implementation

The implementation of this interviews was the same as that of the expert interviews. An interview guide was created, and a consent form was sent to the participants in advance. A semi-structured interview guide was created, and it consisted of three topics. The first topic area assessed how involved the participants were in their district or in the city, asking questions such as: Do you participate in events? How do you stay informed? What do you stay informed about? and so on. The second topic area evaluated the use of technology asking participants questions such as: How often do you use technology (smartphone, laptop, tablet, etc.)? Which technology do you use? What do you use the technology for? What is your opinion on the use of technology in public space? Would you use interactive displays? and so on. The third and final topic area dealt with the basic idea of the app and the three different methods of participation. The ideas and basic concept of the app were explained, and then questions were asked such as: Would you use this app? and Which idea for participation do you find more appealing? At the end of the interview, the experts were thanked for their time and for answering the questions.

6.4.2 Execution

Five interviews were conducted in the period from 29.06.2020 to 05.07.2020 and lasted between 20 to 40 minutes. The consent form was sent to participants in advance by e-mail. Only after they had read and signed the consent form was the interview conducted. At the beginning of the interview, the participants were informed about the recording of the interview, and after they agreed a second time, the recording was started. The interviews were conducted and recorded via Zoom.

6.4.3 Data Analysis

The analysis of the data was conducted on the basis of the notes taken during the interview. The MAXQDA program was used to analyze the data. The notes were divided into subject areas and analyzed.

6.4.4 Results

This section contains the results of the thematic analysis of all interviews. The results are divided into thematic areas.

Involvement in Their District

The first part of the interview was designed to reveal how involved the participants were in their community or district. The interview participants all indicated that they were not very involved. They reported that they participate in events and inform themselves but do not participate in events that deal with the design of the district or in local council meetings. The events they reported participating in were more for leisure like parties, events for children, neighborhood gatherings to get to know the neighbors and so on. The main reason stated for not being more involved was the lack of time.

Events. All participants stated that they had not yet planned an event themselves due to time constraints. One participant stated that they have to plan events for work and therefore know how time-consuming this is. Another participant said that it would be too stressful for them to attend more events or plan one: "I have a wife and children so I cannot go to so many events. If I participate in events, they have to be child friendly"[64].

Another participant stated that they like to take part in events, but "since the lockdown there is unfortunately not much to do in the city. It's very difficult right now[65]." This person recently moved to Vienna and had participated in many events before Covid-19 (sport events, getting to know the neighborhood, music festivals, meeting new people, etc.).

Participating in Creating Something New. All participants stated that they do not or did not participate in order to create something new. Three participants stated that they did not have time and would not participate in creating something new. One person stated that they prefer to see what others are doing first and then decide if they want to participate in events or participate in creating something new. After seeing what the process is like, then this individual may get involved and participate. One participant's answer to the question whether they would like to participate in the shaping of something new in the district was: "depending on how big the scope is, but yes, I

[64]Translated from German: "*Ich habe Frau und Kinder und dann kann ich nicht auch noch auf so viele Veranstaltungen gehen. Wenn ich an Veranstaltungen teilnehme, dann müssen sie kinderfreundlich sein*"

[65]Translated from German: "*seit dem Lockdown kann man leider wenig in der Stadt machen. Es ist gerade sehr schwierig*"

think so"[66]. The participant is new in town and stated: "I find it exciting to meet new people. Depending on where you create something new or help with the design you can always see the result. When you walk past it, you have a good feeling because you helped to design it"[67].

Source of Information. Regarding participants' source of information about what is happening in their own district, two people stated that their wives take care of it. The wives are each in Facebook groups and stay informed about current events. In these groups, the neighbors can exchange information and receive information from responsible persons. Two other people indicated that they keep up to date on current events through Facebook. One person stated that they exchange information with other people via the Friendseek[68] platform and are thus quickly informed of events taking place. They use this platform to find new acquaintances and explore the city with others. In addition, three people receive information about the district through newspapers and posters.

Use of Technology

The second subject area of the interview investigated the use of technology. The aim was to find out which technologies the participants used and whether they used technology in public space.

Types of Technology they Use. All participants stated that they use their smartphones very often. Smartphones are used for daily tasks like making phone calls, communicating with friends/family, performing work tasks, shopping, booking holidays, navigating (Google Maps), checking timetables and so on. All respondents reported that the smartphone is one of their most important devices. Three participants stated that they hardly use any other technology. Only two people additionally used a tablet, computer or other smart devices. It was reported that the computer is only used for tasks that cannot be done with the smartphone or for work. It was specified that a laptop is used "only for creating lists or documents. But this happens very rarely"[69]. Furthermore, one participant stated that they would not leave the house without a smartphone and that "mobile internet or WLAN are very important anyway"[70]. One participant stated that they are very interested in technology. They are always buying new smart devices and trying to link them together. Control via mobile phone or via Alexa was reported to make everyday life easier for this participant.

[66] Translated from German: "*je nachdem wie groß der Umfang ist, aber ja, ich glaube schon*"
[67] Translated from German: "*ich finde es spannend neue Leute kennen zu lernen. Je nachdem wo man etwas neues gestaltet oder bei der Gestaltung mithilft kann man das Ergebnis immer wieder sehen. Wenn man daran vorbeigeht hat man dann ein gutes Gefühl, weil man bei der Gestaltung mitgeholfen hat*"
[68] https://www.friendseek.com/ (last accessed on 2020-07-12)
[69] Translated from German: "*nur für das erstellen von Listen oder Dokumente. Aber das kommt sehr selten vor*"
[70] Translated from German: ''*mobiles Internet oder WLAN sind sowieso sehr wichtig*"

Use of Technology in Public Space. This line of questioning aimed to find out if people would use technology in public spaces. The initial idea of this thesis was to put an interactive display on the *Ermöglichungsfläche* and allow people to design something together. All participants indicated that they would use an interactive display. One participant responded to the question by saying: "I like pushing buttons, so I would use interactive displays in public space"[71]. All participants said that they would find an interactive display very helpful to learn more about a place, including the history of the district, where something is located and when events take place. Participants reported that if they saw a display at an event, they would use it to learn more about the event. One person stated that he would not use these displays "if there is a queue in front of them. Then I don't feel like using them anymore"[72]. When asked if they would use the interactive display to collaborate, one person said they would like to and also stated that: "Creating is nice and sharing is nice, but I would never use something like that if I had to give my name and stuff. In that way I am rather conservative. Then I am afraid of being hacked or something. I'd only use it if everything is anonymous"[73]. Another person stated that they would love to use an interactive display: "I only know this from the museum, and I think it's really cool. Above all I would like to test if it works at all"[74]. For this participant it was not clear whether these interactive displays would work at all or could add value outside of museum. Another participant stated that it would be very helpful if WLAN was available in public space.

The App – Basic Idea and Participation Possibilities

The final section of the interview presented the basic idea for the app to be developed as well as the different ideas for citizen participation possibilities. The questions were designed to assess whether the app would be used and which participation idea would be favored by the residents. Furthermore, this part of the interview was intended to help refute or verify the hypothesis that people would need to already be active in their district and community to use the app. The app itself was not demonstrated to the participants, but the individual functions were explained (the app itself will be discussed in more detail in the following Chapter 7 Prototyping).

The Idea. The basic idea of the app was well received by all participants. They said they would find it helpful to know exactly where the *Ermöglichungsflächen* are located, what they look like and what events take place there. Furthermore, they found it helpful that the app would keep them up-to-date and informed about the current status of the

[71] Translated from German: "*Ich drücke gerne auf Knöpfe, also würde ich interaktive Displays im öffentlichen Raum verwenden*"

[72] Translated from German: "*wenn eine Schlange davor ist. Dann habe ich keine Lust mehr darauf diese zu verwenden.*"

[73] Translated from German: "*Gestalten ist zwar schön und austauschen auch, aber ich würde so etwas nie verwenden, wenn ich meinen Namen und so angeben muss. Da bin ich eher konservativ. Habe dann Angst davor, dass es gehackt wird oder so. Würde es nur verwenden wenn alles anonym ist.*"

[74] Translated from German: "*Ich kenne dies nur aus dem Museum und finde das ganz cool. Vor allem würde ich gerne testen ob das überhaupt funktioniert*"

ideas contributed. One participant stated that it is very good that the app would be used locally and make is easier to communicate with people in the neighborhood. However, this person also stated that it is very important "that you can sort the areas. I only want to receive information about areas that are in my district"[75]. Two participants stated that they would use the app to get information, see what is happening in the areas and what ideas and suggestions come from the other residents. They probably would not use the app to contribute their own ideas or help shape others' ideas. They reported limited time as the reason, and one said: "because I don't have the time. Full time job, I exercise twice a week if all goes well and I have children. And I also have to sleep"[76]. The other three stated that they would contribute their own ideas and evaluate the ideas of others. One person explained why they liked the idea: "What is also very nice about such an idea is that you created something together and you were involved"[77].

Ideas for Citizen Participation. In general, the participants found the ideas for participation very good. One person stated that they would not use the idea of evaluating design proposals from the City of Vienna. This would not be real participation in this person's opinion. Furthermore, they stated: "the residents should decide for themselves what to put there. It should not be given by the city"[78]. One person stated that they would very much like to contribute ideas. They often do not know where to post ideas, and this app would make this clear. They reported sometimes thinking: "that certain ideas are cool and would certainly be interesting for others, but then I don't know where to post them"[79]. They also stated that they would not design the area (Idea 3) and that they would only use this option if they have "a concrete idea"[80]. Two participants could not decide which idea they would prefer. They thought they were all good and that they would use them all. One participant stated that they only felt the submission of ideas made sense if it was really supported by the City of Vienna. The city must react to the ideas and suggestions. The residents must have the feeling that they are taken seriously and that their ideas are really being considered. This person also mentioned the MySugr[81] app. The people in charge of this app react immediately to user feedback. They clearly consider the feedback provided, and for this individual that is very important.

[75]Translated from German: "*dass man die Flächen sortieren kann. Ich möchte nur Informationen über Flächen erhalten die sich in meinem Bezirk befinden*"

[76]Translated from German: "*Weil ich die Zeit nicht habe. Vollzeitjob, ich gehe zweimal die Woche trainieren, wenns gut geht und ich habe Kinder. Und schlafen muss ich auch einmal.*"

[77]Translated from German: ''*Was auch sehr schön an so einer idee ist, dass man etwas gemeinsam gestaltet hat und man war beteiligt.*"

[78]Translated from German: "*die Bewohner selbst entscheiden sollen was dort hinkommt. Es soll nicht von der Stadt vorgegeben werden*"

[79]Translated from German: "*dass gewisse Ideen cool wären und sicher auch für andere interessant wären, aber dann weiß ich nicht wo ich diese veröffentlichen soll*"

[80]Translated from German: "*eine konkrete Idee hat*"

[81]https://www.mysugr.com/de-de/ (last accessed on 2020-07-12)

6.4.5 Conclusion

The participants in the interview stated that they were not involved in their own neighborhoods due to time constraints. They reported that they inform themselves about events and are also happy to participate in events, but basically, all of them prefer to take part in existing events and do not want to plan or organize events themselves. For them, it is easier and less time-consuming if they only participate. It is also interesting that the participants indicated they would like to participate in the design but do not know exactly how to do it. They need more help or would like to first see how something is set up and participate later. The app would make it easier for them to share their ideas and thus get involved in shaping their community.

The mobile phone was reported to be one of the most important devices for all five participants. They use their mobile phone for many purposes. The development of an app as a tool for participation is therefore an advantage. Residents already use smartphones to inform themselves, and with the help of the app they can easily keep up to date with what is happening on the *Ermöglichungsflächen*.

The hypothesis that people will only use the app if they are already involved in their community is not supported by the results of the interview. In further steps, this hypothesis should be examined more closely and more people should be interviewed. The basic idea of the app was appealing to the participants, and they indicated that they would use it. Three out of five people would actively participate. Two people who had hardly informed themselves previously reported that they would use the app to inform themselves. The basic idea of the app therefore would bring added value to the residents.

CHAPTER 7

Prototyping

This chapter explains the development of the prototype of each phase. The procedure for creating the prototype, the tools used, the inspiration for the design of the app, the analysis procedure and the results of each phase are explained in detail. The Initial Prototype Idea discusses the development of the prototype in more detail and explains how the collected data influenced the development. The features and functionality of the initial prototype idea are explained, and the creation of the sketches that represent these features and functionalities is presented. The implementation, execution, data analysis and results of the evaluation of the low-fi and hi-fi prototype are discussed. Finally, the final prototype, the corporate identity and the concept of the final prototype are explained

7.1 The Initial Prototype Idea

The basic idea behind the development of the app was to create a tool that would bring added value to Vienna residents as well as to the city itself and make it easier for residents to submit ideas regarding the design of public space to the city. Furthermore, the app should make them aware of the *Ermöglichungsflächen* and increase their participation in designing them. *Ermöglichungsflächen* are areas that can be designed by the residents. They can take ownership of them and make them their third place. During the research and the interviews with experts, it became clear that not all ideas and wishes can be implemented immediately and that certain types of ideas need to be approved in advance in order to avoid negative impacts and maintain the safety and general welfare of the residents (e.g., if areas are changed and something is built on them or if events exceed a certain number of people). It is therefore necessary that residents submit their ideas to the City of Vienna in advance, wait for the decision of the city and then start implementing the idea. This process can take up to six weeks. The tool to be developed should therefore facilitate this process or represent an intermediate step, which should make the process

easier for the responsible city persons as well as make it easier for the residents to express their opinions.

The app should offer the possibility to submit an idea without requiring an official submission to the City of Vienna and without requiring navigation of the entire process and guidelines in advance. However, in order for an idea to be submitted and implemented, certain criteria must be met. Not all ideas submitted by citizens comply with the guidelines of the City of Vienna, and these are therefore rejected. During the expert interview with the *Grätzloase*, it was also noted that once ideas are rejected, residents or applicants do not often submit them again. In many cases, however, the rejection is only caused by a small mistake or missing information, and if the application were revised appropriately and then resubmitted, the idea could be implemented. With the help of the app, it should therefore be possible to submit any idea and have the responsible departments/persons assess its feasibility. The residents should also have the possibility to be informed about the current status of their ideas.

Furthermore, it was noted in the expert interview that the guidelines and rules of the city may change if the responsible persons realize that several people share the same wishes. The question is therefore how to get ideas and opinions from the residents and how to determine whether the ideas are widely supported. The app should make this possible. For example, a resident may want a barbecue area or a place where it is possible to meet other people and cook something together. The app should help determine whether more residents want this or if this is only important for one person.

The app should allow residents to actively contribute new ideas and wishes as well as make it possible to be inspired by other people and evaluate the ideas and wishes of others without submitting anything new. During the interviews, it became clear that often the same group of people participates in surveys or events, and it is difficult to find new participants. The app should make it easier for residents to participate in design and also make it easier to achieve a wider reach in the survey and participation of residents.

Another basic idea was to enable residents to experience the space. Some of the residents interviewed did not know which areas were the *Ermöglichungsflächen* or what these areas looked like. The app should therefore enable residents to see a space and also experience suggestions for the future design of the space and thus be able to better evaluate them. A 360 degree view of the space should make it easier for the residents to imagine if they would want to spend time in the space, or if they are satisfied with the new design. They should feel as if they were there when using the app and be able to experience the space.

During the research and development phase, the question of whom the app should be designed for arose. In order to facilitate citizen participation and co-creation, the app should be helpful for all stakeholders (the residents, the city, the responsible department, etc.) involved. The inhabitants of the city should be able to give their opinion and help to design the public space. Furthermore, they should be informed about the current status of ideas and suggestions, enable an exchange of ideas. Residents should be able to use the app to create a new idea and share it with other residents, and the other residents

should be able to rate the idea and give their opinion on it. The persons responsible for the care and appropriation of the relevant areas (in the case of the *Ermöglichungsflächen* of the Seestadt Aspern, this is the district management) will receive the opinions of the residents and also be able to see how the ideas are received by the others. This should enable the responsible persons to evaluate ideas well or use frequently occurring ideas and check them against the city's guidelines. If an idea can be adapted to the guidelines or already meets the guidelines, the district management can submit the idea to the City of Vienna and then work with residents to implement the idea. If implementation is not possible, the idea can be discussed with the residents and modified to comply with the guidelines, at which point it can be submitted to the City of Vienna. It is also possible that an idea cannot be implemented at all. In this case, the reasons can be shared with the residents so that they know their idea was really taken into account. In this way, the residents are involved, an exchange of ideas takes place and the highest level of participation can be reached.

7.2 Features and Functionality

The first step was to define the functionalities and features of the app that would be implemented in the initial prototype. This should facilitate the creation of the app by enabling a step-by-step extension of the prototype to reach the end goal. The functionalities were initially based on the results of the previous URM, but they changed during the prototyping process. The list was written and processed by hand. The sketches in the following section are based on these functions. The entire initial list of features and functionalities is listed in the Appendix C.1. The list contains different functions like an event overview, creation and editing of a profile and all information about the *Ermöglichungsflächen*, including how they are visualized and how the inhabitants of the City of Vienna can participate in shaping those areas.

7.3 Sketches

After the functions and features were defined, free-hand sketches were created. Figure 7.1 visualizes an example of a free-hand sketch. These were created step-by-step, which means that during the prototyping, only one feature or functionality was implemented at a time. During the creation of the app, examples of other successful apps were referenced and analyzed to see which steps they perform and how the user interface is built. For the first screens of the app (e.g., welcome page, registration and logging in, general terms and conditions and data protection declaration, maps screen and menu) apps like ShareNow[1], Lime[2], TooGoodToGo[3], Canva[4] and Tier[5] were analyzed. The creation of the sketches

[1]https://www.share-now.com/de/de/ (last accessed on 2020-03-11)
[2]https://www.li.me/de/startseite (last accessed on 2020-03-11)
[3]https://toogoodtogo.at/de-at (last accessed on 2020-06-29)
[4]https://www.canva.com/ (last accessed on 2020-06-29)
[5]https://www.tier.app/de/ (last accessed on 2020-03-11)

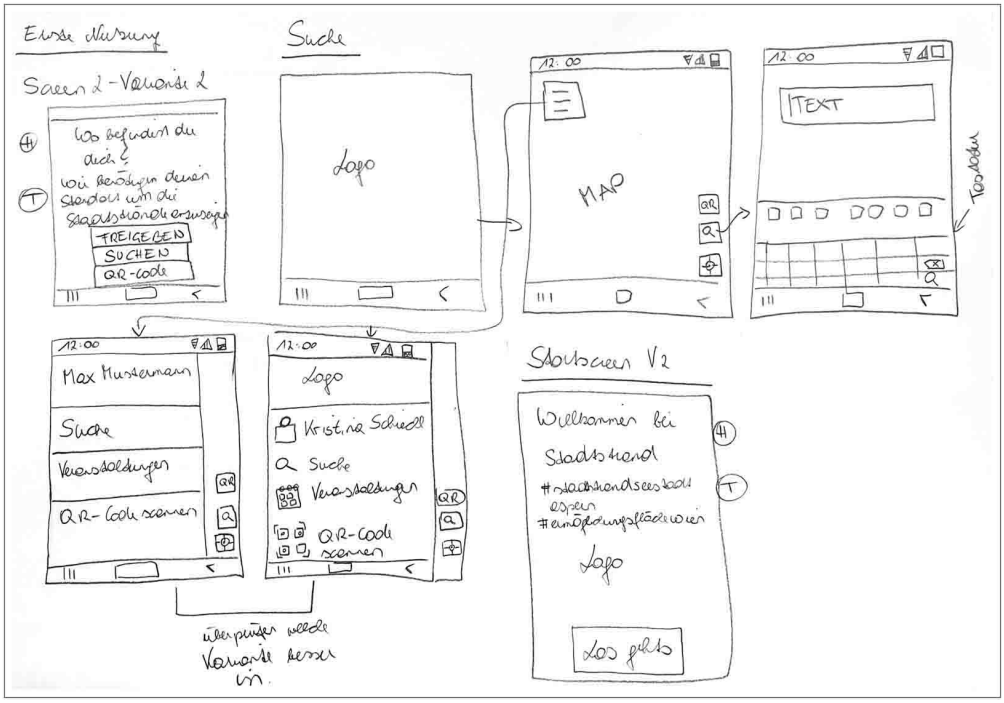


Figure 7.1: Free-hand Sketch. On this sketch you can see a variation of how to share your location, two welcome screens, the search, the map overview and the menu.

took approximately three days.

7.3.1 Main Functions of the App

A total of five main functions were chosen for the app:

(1) Visualization & Information about *Ermöglichungsflächen*. One of the main functions of the app is to visualize the *Ermöglichungsflächen* and get information about these areas. Residents should be able to see where these areas are located with the help of an integrated map that is similar to Google Maps[6] and also has the same functionality. People know how to use this type of map and are familiar with its the functionalities. The users of the app should be able to share their location or enter an address to see the nearest areas. Furthermore, it should be possible to find out more about the individual areas themselves. The areas differ in their structure as well as in their infrastructure (see also Section 6.2). With the overview of different informations of the areas, residents can learn more about where they are located, how they are equipped, what they look like and what the shape (floor plan) of these areas is.

[6] https://www.google.at/maps (last accessed on 2020-05-30)

(2) "Experiencing" the design of *Ermöglichungsflächen.* Another main function of the app is to share the current design of the *Ermöglichungsflächen*. With this function it should be possible to see the areas in a 360 degree view and "experience" them.

(3) Event Calendar. Through the expert interviews and literature review, it became clear that events take place at these areas. This is the reason visualization of events by means of a calendar view is a function of the app. The district management always organizes events that take place on different *Ermöglichungsflächen*, and these should be visualized. The integration of these events should make it easier for residents to be informed about the latest events.

(4) Notifications. Notifications are another main function of the app. Residents should be kept informed about current topics such as adding new proposals or design ideas, new events, meetings regarding the space, evaluation of surveys or uploaded ideas and so on. The residents should be actively involved in the development and design process, and the notifications will make it this involvement easier to achieve. Users can receive the notifications via push notifications, via email or directly in the menu under "Notifications".

(5) Citizen Participation & Co-Creation. Another main function is citizen participation and co-creation. For this function, three different variants of ideas were developed to allow inhabitants to express their opinions. One top-down and two bottom-up participation options were developed.

Idea 1 - Write down the Idea. The second idea is bottom-up participation based on the idea of the City of Vienna's "WOW - Mach mit" (see Section 3.6.4) and AvaLinn (see Section 3.6.7). Citizens should be able to enter an idea using a text box. These ideas can in turn be evaluated by other citizens. Frequently occurring or highly rated ideas can be assessed and adapted to the guidelines of the City of Vienna. If an idea can be adapted, the ideas can be submitted and implemented.

Idea 2 - Reviewing Different Design Options. The first idea is top-down participation. The City of Vienna has specified different designs for the *Ermöglichungsflächen*. In this case, it is not existing designs but possibilities for future designs that are of interest. These would be presented with a 360 degree view for the resident to evaluate. This idea is best illustrated through a simple example. The survey of the residents of Vienna showed that plants, greenery and seating are very important. Consider that an expert who is involved in public space, spatial planning and design is commissioned by the City of Vienna to propose a design for these areas. This design should include the characteristics of interest to the residents and be presented in a 360 degree view using the app. These design ideas can then be evaluated by the citizens. Positively evaluated designs can be submitted to the City of Vienna and then be implemented.

These design ideas should meet the requirements of the city (i.e., it should be ensured that the evaluated ideas can actually be implemented).

Idea 3 - Designing the *Ermöglichungsflächen*. The third idea is again for bottom-up participation. With this idea, it should be possible for residents to design the areas according to their own wishes. The idea is similar to the design of kitchens or home furnishings and is based on the principles of the apps Roomle[7] Houzz[8] and Pokemon Go[9]. The apps are using Augmented Reality. Residents should be able to create the desired design directly on imagery of the real area. Different objects can be selected and placed in the areas. If the residents are satisfied with their own design, it can be shared with other users.

7.4 Low Fidelity Prototype

The low-fi prototype was created using Balsamiq Wireframes[10]. As with the sketches, the individual features and functions were created and adjusted one after the other. Sequences or representations that were not yet fully developed during sketching were reimagined and changed in this step. The three different design ideas were realized in three different prototypes. The initial plan was to test all three variants and to further implement the most highly evaluated prototype. The prototypes aimed to provide evaluators a first impression of the structure of the entire app so that they could give feedback on the existing functionality and presentation. The creation and structuring of the low-fi prototypes took about four weeks.

The icons used to create the prototypes (low-fi and hi-fi) were used from Balsamiq Wireframes and Figma as well as from the site Flaticon[11]. The authors of the site Flaticon are listed in the Appendix C.2.2.

7.4.1 Implementation & Execution

The evaluation of the low-fi prototypes was performed at different development stages. The first evaluation assessed initial entry into the app at the point the welcome screen, login/registration, map overview and menu were available. The feedback of this evaluation was immediately incorporated into the prototypes and missing features were implemented. After all functions and features were completed for initial entry into the app, another evaluation was done. After this evaluation, the prototypes were changed again, and three additional user tests were performed on this prototype version. In total, the prototypes were tested by five people, and a total of six user tests were carried out. The evaluators were between 25 and 58 years old (average age: 41). One evaluator was a UX/UI designer,

[7] https://www.roomle.com/en (last accessed on 2020-06-29)
[8] https://www.houzz.de/ (last accessed on 2020-06-29)
[9] https://www.pokemongo.com/de-de/ (last accessed on 2020-06-29)
[10] https://balsamiq.com/ (last accessed on 2020-03-11)
[11] https://www.flaticon.com/ (last accessed on 2020-08-23)

one was a front-end developer, one a teacher, one self-employed and another one an architect.

Figure 7.2: A scenario from the user test of the low-fi prototype. The screens were created using Balsamiq Wireframes.

The user tests took place on 12.03.20 and between 05.04.–15.04.2020 and lasted between 30 and 110 minutes. The testers had received a consent form (see Appendix A.1) in advance via email. In order to participate in the test, the form had to be read, signed and sent to the author of this thesis before starting the test. Furthermore, a PDF file was created that visualized different scenarios for the use of the app (see Figure 7.2 for one example scenario). On every page of this PDF file an extra scenario has been added. The PDF file has been created to make it easier for the tester and author to discuss the scenarios. The user tests were conducted via Skype, and audio recordings were made using a voice recorder. The evaluators were asked to share their screens so that the author could see which designed screen (e.g., which page of the PDF) they were looking at. The evaluators were informed that the test would help the author to assess the comprehensibility and usability of the app and was not intended to test their personal abilities. They were also informed that a lack of understanding would not indicate lack of knowledge on their part but rather that the app should be adjusted. Furthermore, the testers were advised to think aloud throughout the test to provide better insight into unclear functions or representations. They were also advised that the feedback should be honest because it would act as an important basis for the revision of the app and be of great value in further development.

Before the test began, the evaluators were once again informed that the test would be recorded, and after they agreed a second time, the audio recording was started. The PDF file was then sent to the evaluators, and the screen sharing function was activated. The

individual scenarios in the PDF were discussed step by step. Notes were taken during the user test.

7.4.2 Data Analysis

After the interviews were completed, the audio recording was listened to again, and the notes were expanded. Missing and important additional information was added. All topics discussed during the user test were divided into themes (e.g., event calendar, filter, search, etc.), and after each modification or after each test with a new and revised prototype, a mind map was created using XMind Zen[12]. A total of three different mind maps were created.

7.4.3 Results of Evaluation

The evaluation of the low-fi prototype was performed on three prototype variants. The feedback of the first two tests was immediately incorporated to avoid further misunderstandings and to better address the main functionalities. The results of the evaluation are therefore divided into three sections.

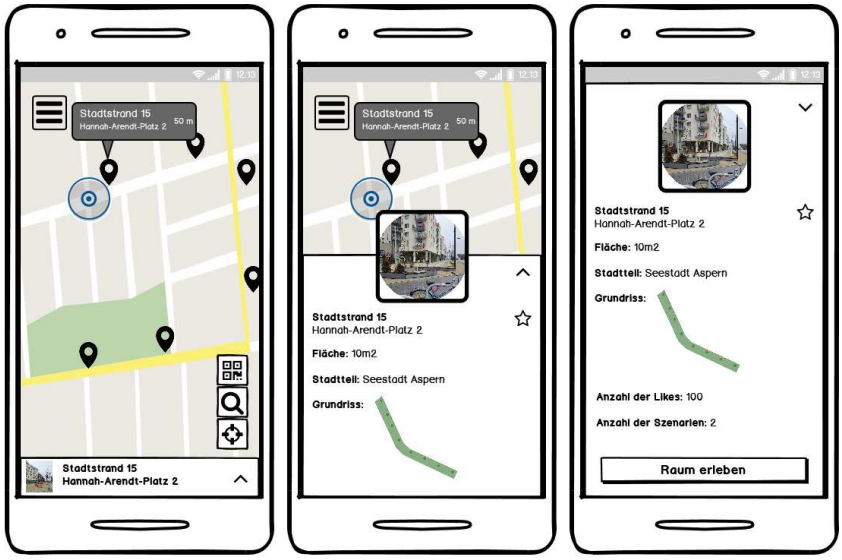


Figure 7.3: Information about a specific Ermöglichungsfläche

First Evaluation

During the first prototype evaluation, two topics were discussed and then adapted immediately after the test was performed. These two topics are briefly explained below:

[12]https://www.xmind.net/xmind2020/ (last accessed on 2020-06-29)

***Ermöglichungsflächen* - Information.** This screen should give the user more information about the *Ermöglichungsflächen* themselves. Each area has a different shape and size, and therefore a floor plan was inserted (see Figure 7.3). The evaluator noted that the display of the floor plan would not bring any added value to the user. The floor plan of the area should be larger or available in a larger view by clicking.

Reviews and Ratings. The app allows users to evaluate the current design of the areas by assigning a "like" (see Figure 7.3). The information screen shows how many likes the current design of the areas has. The tester said that it would be more useful and interesting if more information about the ratings were provided. A system like Google Reviews would be ideal. In this way, a user can give his/her rating and again rate the rating.

Second Evaluation

The comments of the first evaluation were implemented, and a revised low-fi prototype was used for the second evaluation. During the second user test, three main topics were discussed, which are briefly explained below.

Figure 7.4: Low-fi prototype: settings

Settings. The user can access the settings of the app from the menu (see Figure 7.4). During the user test, it was mentioned that the individual names of the settings are not understandable, and it was not clear which options can be set in each case. The icons were also reported not to be appropriate for the respective functions. These two screens were therefore adjusted to make the settings more logical.

***Ermöglichungsflächen* - Information & Floor Plan.** After the first evaluation, the feedback about the information and floor plan was implemented (see Figure 7.5). The information was divided, and the floor plan was altered so it no longer displayed as a single area but as a map. This new map can be zoomed in and out and has the same functionality as a map in Google Maps. Additionally, icons were added to provide additional information about the surrounding area. During the second test that assessed this new map, it was noted that the user would like more information. The suggestion was made that this option should not be called "Floor Plan" but "Information" and should only show the floor plan because all further information can be obtained via the normal map. This display should be redesigned to provide added value for the user.

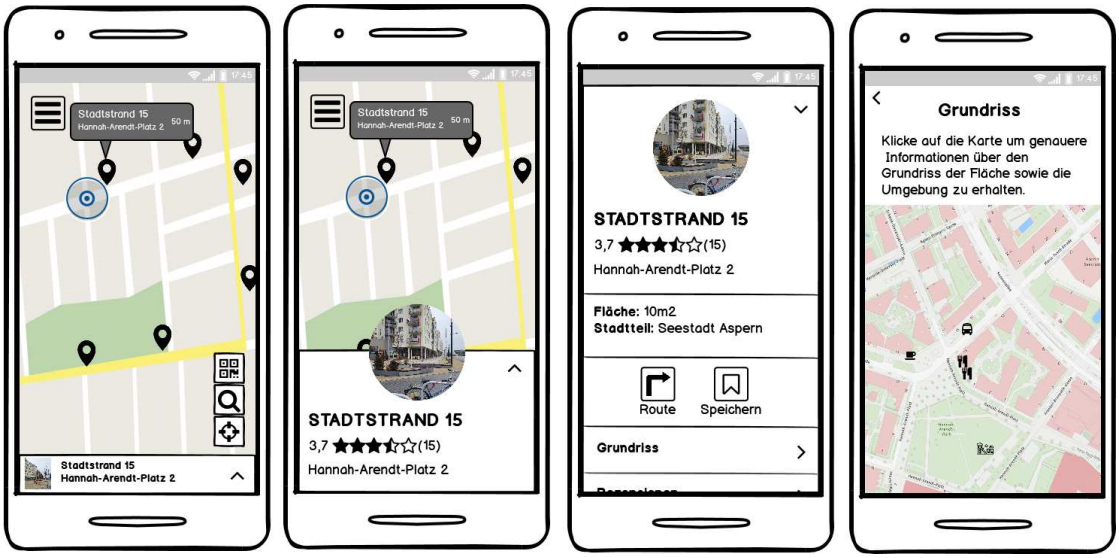


Figure 7.5: Low-fi prototype: Ermöglichungsflächen - information

Reviews and Ratings. After the first user test, the screen for evaluating the areas was changed. The Google rating system was implemented to give the user more precise information about the ratings of the design of the areas. For each design, and also for the current design, the user can see how satisfied other residents are with this design (see Figure 7.5). As soon as the user opens the information for the current *Ermöglichungsfläche*, he/she sees the current rating of the area. During the user test, it was mentioned that a poor rating of an area could create a very negative impression of the current design and cause people to not want to visit the area or open the information for the area. Furthermore, it was also mentioned that there were too many rating options available (see Figure 7.6). The user should only have one opportunity to rate the areas and the design, and consequently, the question "Should this design be implemented?"[13]

[13]Translated from German: "*Soll diese Ausgestaltung realisiert werden?*"

should not be asked. They have already indicated, with the help of the star rating, how they find the design.

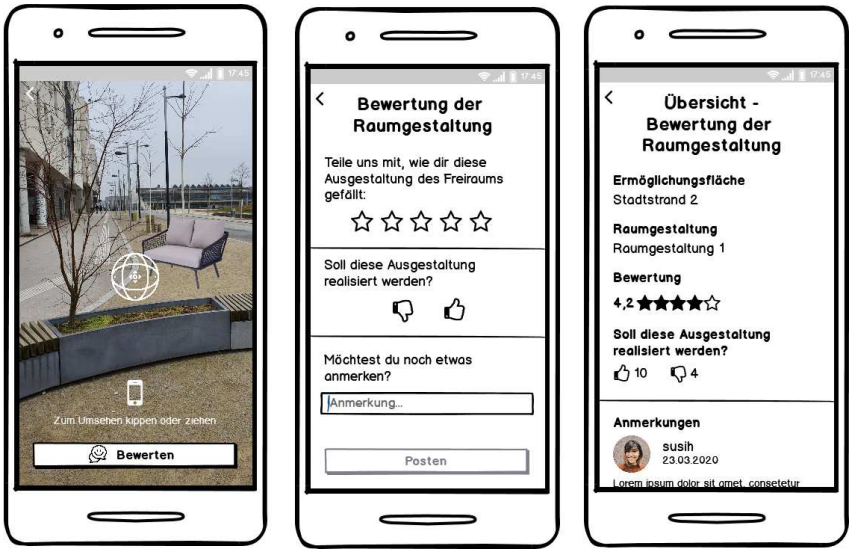


Figure 7.6: Low-fi prototype: Reviews and ratings

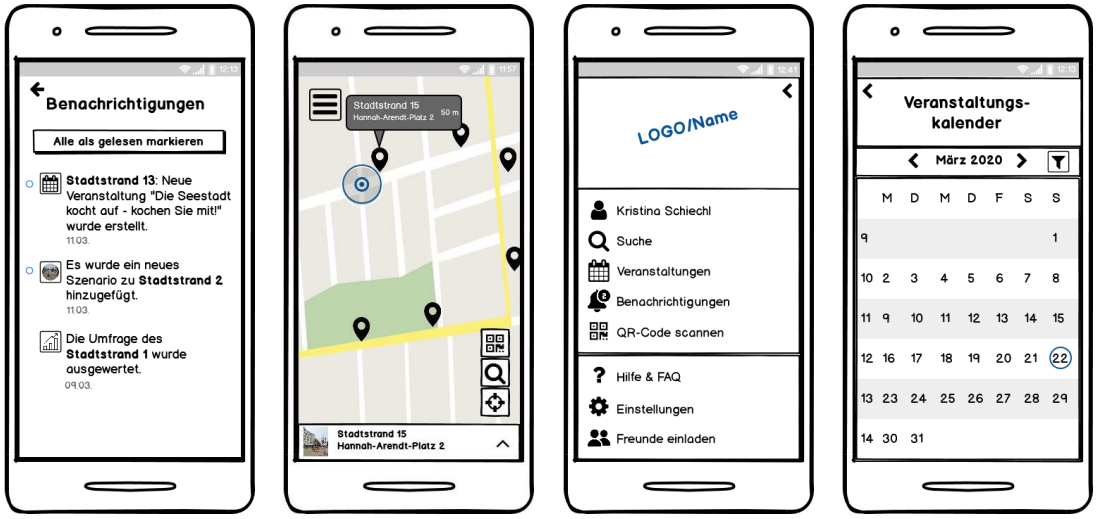
Further Evaluations

The comments from the second evaluation were implemented, and a revised low-fi prototype was used for the next four evaluations. During these tests, there were no misunderstandings requiring an immediate modification of the prototype. Due to the earlier revisions, the prototype was already clearer for the testers. The following section summarizes all comments of the testers from the next four evaluations.

Design, Process & Display. This category addresses the design, the process of the prototype and the presentation of different elements. Care should be taken that the same symbol is used consistently for the same function. In this prototype, two different back button symbols were used (see Figure 7.7a and Figure 7.7d). One tester remarked that this was confusing, and it was not clear if the two icons had the same functionality.

Furthermore, the icons were displayed on some screens with and without border (see Figure 7.7a and Figure 7.7c). For the comprehensibility of the design, the icons should all be displayed in the same manner.

One tester has remarked that the comprehensibility of the app could be improved by creating a short introduction (i.e., onboarding). All important functions should be explained when getting started with the app. For the user, this type of introduction would be helpful in understanding from the beginning what the app can be used for.



(a) Notification screen *(b) Map screen* *(c) Menu* *(d) Calendar*

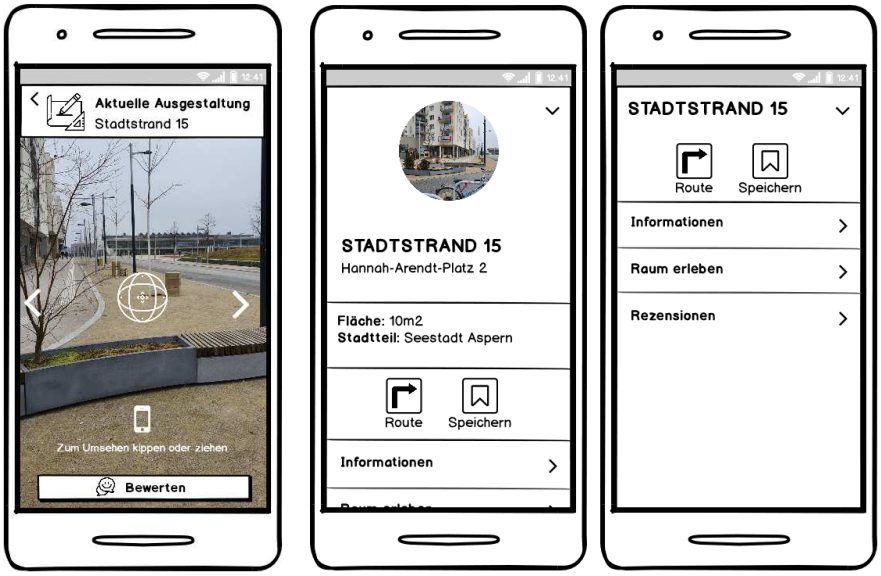
Figure 7.7: Screens that were discussed during the first evaluation and about which the tester had comments.

The notification screen informs the user about everything that concerns the *Ermöglichungsflächen* (e.g., new events, new meetings, results of ratings, new design proposals, etc.). One tester noted that the icons already take up a lot of space in the notifications screen (see Figure 7.7a). It would be clearer if the icon, the notification of new messages and the text itself were split across several lines. This would make the text easier to read.

The user can open the overview of the *Ermöglichungsflächen* and see information and further options (see Figure 7.8b). One tester noted that the most important feature should be visible in the overview of the options without scrolling. This would make it easier for the tester to see which options represent the most important functionality of the app.

Event Calendar & Filter. The event calendar provides the user an overview of upcoming events and information about them. Furthermore, a filter can be used to display only the events that are of most interest to the user, such as only the events in a particular district. One tester mentioned that the display of the calendar was not clear. At first glance, it was not clear whether it displayed calendar weeks or the date itself (see Figure 7.7d). The test person noted that a clearer display would be beneficial, for example one that separates the calendar weeks and dates. Two other testers noted that they were not familiar with the filter icon and would not click on it because it was not obvious that it was a button or clear that it performed an action.

Search. The search allows the user to search for an area and then select it to get more information. For the testers, it was not quite clear what exactly could be searched.



(a) "Raum erleben"-screen *(b) Overview Ermöglichungsflächen*

Figure 7.8: Low-fi prototype

For them, it would be helpful to be able to search for areas and events. The search should be extended so that several items can be selected and thus the searchers can be defined. It should be possible to search by type of area, district, event type and so on.

Account. When using the app for the first time, the user must create an account or log in to an existing account. For two testers, the screens for this functionality were not clear. It was not quite clear where to log in or where to register. Both testers mentioned that this is easier and more intuitive with other apps or sites.

Ideas. As previously mentioned, three different ideas for citizen participation were developed. Idea 1 was understandable for the testers and nothing was noted.

For Idea 2, the evaluation of suggestions for the design of the areas (see Figure 7.8a), the presentation in the app was not clear to the testers. With the help of this representation, the user is able to get a 360 degree view of the current design as well as the ideas for the future design. Using arrows on the right and left side of the screen, users can move to the next suggestion. The testers reported that it was not clear that the arrows on the left and right sides could be used to change to another design suggestion. They associated them with movement in the space itself.

For Idea 3, the user can select objects, place them in the area and move them around (see Figure 7.9). In this way the space can be designed according to the user's own wishes. For the testers, it was not clearly recognizable that the objects could be moved, and

it was suggested that additional icons or markings on the objects would be a helpful indication of this capability.

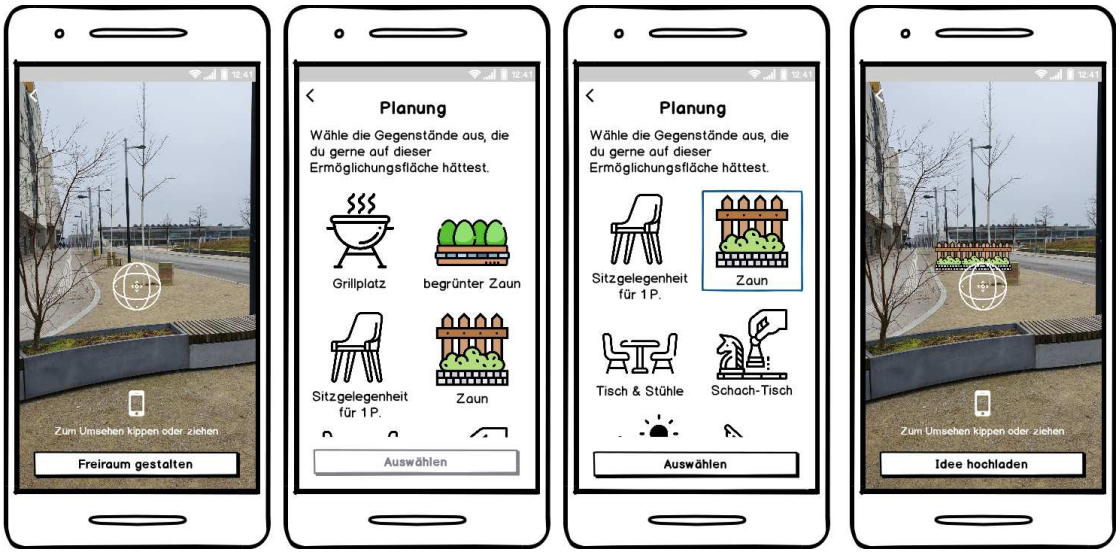


Figure 7.9: Low-fi prototype: Idea 3

Feedback & Concluding Questions

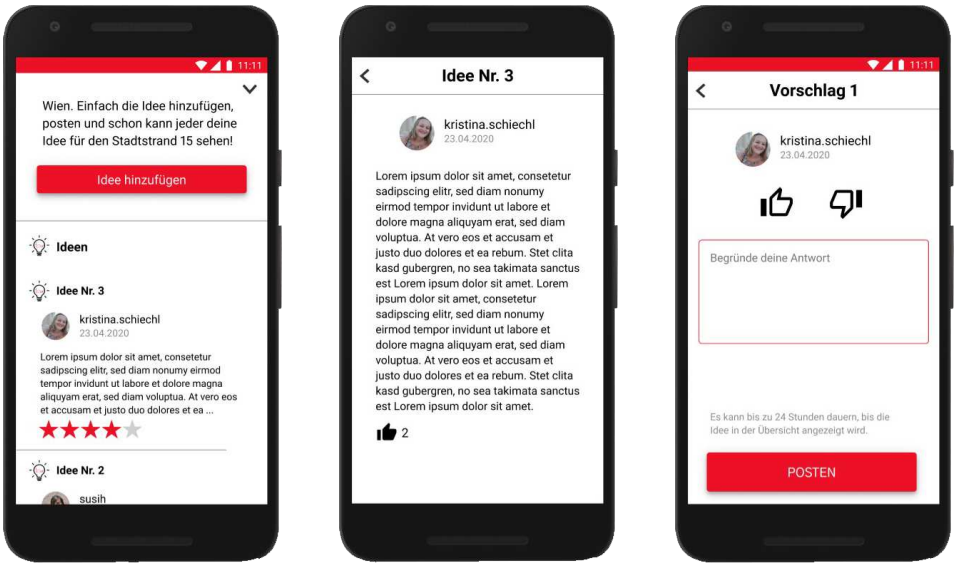
The final low-fi prototype was rated very well by the testers. They liked the idea very much, and three out of five testers reported that they would use this app. The app helps the citizen/the user to stay informed and express their own opinion in different ways. For the low-fi prototype three different variants were developed, meaning each idea was realized in a separate app. At the end of each evaluation, the testers were asked which idea they liked most and would be most likely to use. The testers could select several ideas. In total two people wanted Idea 2 and three people each wanted Ideas 1 and 3. In the next prototype development step, the three single apps were merged into one app to offer the greatest possibility for people to give an idea or to express their own opinion in their favored way.

7.5 High Fidelity Prototype

After the evaluation of the previous prototyping stages was completed, the hi-fi prototype was created using the program Figma[14]. Based on the feedback from the evaluation of the low-fi prototypes, all three citizen participation and co-creation variants were merged into one prototype/app. It could not be clearly determined which idea was preferred by the users, so to ensure the probability of the app being used by many inhabitants of the City of Vienna, all variants are implemented. In order to facilitate this

[14]https://www.figma.com/ (last accessed on 2020-07-01)

realization, the individual features and functionalities were implemented again step by step. Before the features and functionality of the ideas were implemented, sketches were created. Not every idea remained the same or maintained the same functionality, but the similarities between the ideas were implemented consistently. During the creation of this hi-fi prototype, small trial tests were conducted with two different evaluators. They helped confirm that the structure was logical and easy to understand. The creation of this prototype took about 2.5 weeks.



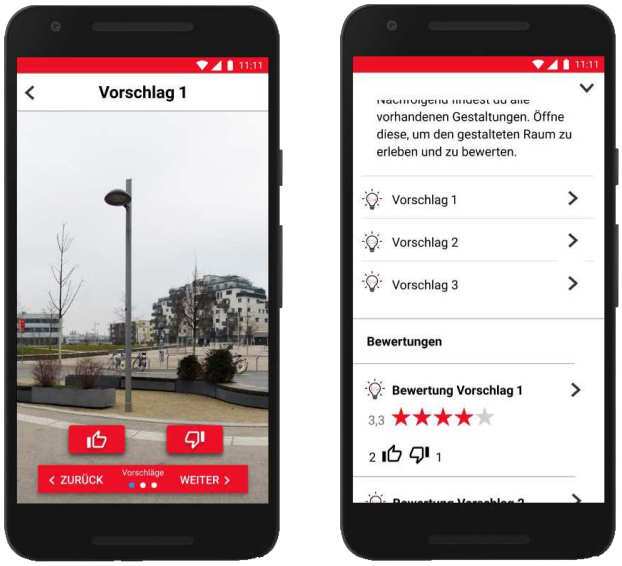
(a) Idea 1: add an idea *(b) Idea 1: add an idea* *(c) Idea 2: Rate design idea*

Figure 7.10: Rating system in the hi-fi prototype. These screens were used for the first pilot test.

7.5.1 Pilot Testing

During the pilot testing phase, one goal was to find a rating system that would do justice to all three ideas and allow consistent construction of all the ideas in the app. Figure 7.10 and Figure 7.11 visualizes the different rating systems. During the pilot test for the rating systems, only the first two design ideas were discussed. In these ideas, the user has the possibility to rate a design proposal and an uploaded idea. In the pilot low-fi prototype, the ratings could be given with a thumbs up or down, and the average of these ratings was displayed as a star rating. The tester mentioned that this was confusing and should be changed to use the same system for both individual ratings and the average (either stars or thumbs up/down).

Another goal, was to build the app in such a way that the user reaches the main function (i.e., to express his/her idea and opinion) in as few steps as possible. In the previous low-fi prototypes, there were too many steps to go through in order to create an idea or share an opinion. Therefore, the structure of the main function was changed. In a first



(a) Idea 2: Rate design idea *(b) Idea 2: Rate design idea*

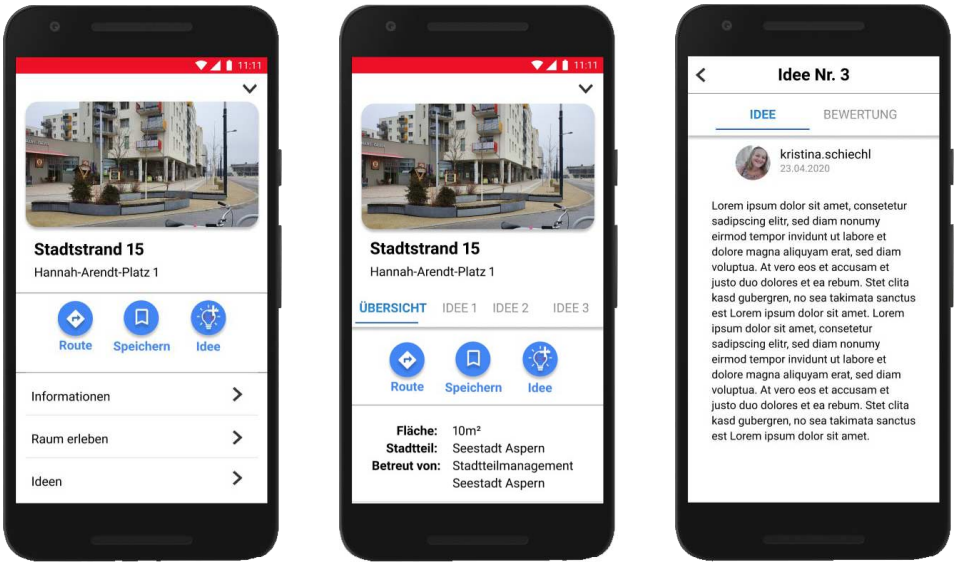
Figure 7.11: Rating system in the hi-fi prototype. These screens were used for the first pilot test.

step, the QR Code icon on the start screen was removed and replaced with an idea icon. The idea itself is more important than scanning the QR Code on the surface. This way, ideas can be submitted more quickly and other ideas and suggestions can be evaluated.

Subsequently, the structure of the app was also changed (see Figure 7.12a). In order to make it more clear that the most important function of the app is the submission of an idea and the evaluation of these ideas, the structure of the app was changed, and tabs were introduced (see Figure 7.12b and Figure 7.12c). The function "Experience Space" (German "*Raum erleben*") can now be reached directly from the image by clicking on the image to display the 360 degree view. In addition, "Information" is called "Overview".

Another problem was the display of all three ideas and the information about the areas. The initial idea was that the information as well as the different design ideas should be accessed via tabs. Also, the differentiation between the idea of the design proposal and the ratings of other users was made by using tabs (see Figure 7.12b and Figure 7.12c). This approach made the structure of the app too complicated for the testers and was therefore changed.

Once the structure and the evaluation system were the same for all three ideas and also understandable for the test persons, the ideas were visualized with different colors and their own icons, and then the main evaluation of the hi-fi prototype was carried out.



(a) The structure of the app before the first pilot tests

(b) Using tabs so see the idea or design proposal and also the reviews from other users.

(c) Using tabs for the different ideas and the general information about the Ermöglichungsfläche

Figure 7.12: Hi-fi prototype: The structure of the app. These screens were used for the first pilot test.

7.5.2 Implementation & Execution

The evaluation of the hi-fi prototype was carried out with a total of six people (or a total of 8 if the pilot testers are calculated). Two people had already been part of the first low-fi evaluation. During the first evaluation, several processes and elements were unclear for these two people, and therefore, they were invited to participate in the evaluation again. The evaluations took place between 29.06.2020–04.07.2020, and each lasted between 30–40 minutes. The evaluators were between 25 and 58 years old (average age: 40). One test person was a receptionist for an ophthalmologist, one was a service manager, one person a translator and one a technical assistant at the opera. The two people from the first evaluation were self-employed and a primary school teacher. The tests were performed and recorded via Zoom. Additionally, the screen was recorded with the program FlashBack Express Recorder[15] to minimize data loss. As in the previous stages, a consent form was sent to the participants in advance, and they were informed about the process. They were instructed to thinking aloud during the evaluation, and informed that if any errors occur during the evaluation, it was not their fault but a fault of the prototype. Furthermore, the test persons were informed that this was a prototype and not a functional app. Not all functions were completely available, only the most important main functions.

[15] https://www.flashbackrecorder.com/de/express/ (last accessed on 2020-07-01)

7.5.3 Data Analysis

Notes were taken during this evaluation. Due to the small number of comments, the recordings were not listened to again. The notes were sufficient for further analysis.

7.5.4 Results of Evaluation

The evaluators had no problems using or understanding the app. The structure of the app was logical and self-explanatory for all participants.

Icons. Special attention was paid to the understanding of the icons during this evaluation, as misunderstandings occurred during the evaluation of the low-fi prototype. The icons chosen for this hi-fi prototype were effective and self-explanatory.

Onboarding. The onboarding screens were the only sources of error during this evaluation (see Figure 7.13). The testers did not understand that this was an explanation of the app and that they would be able to use the individual functions later. The testers expected that the screens of the app or parts of the screens displayed would already have functionality, and they thought that they were doing something wrong because it would not work. The testers could not explain exactly why it was not clear to them. As a result, the texts of the screens was changed in the following step. The text had been formulated very actively, and it could be that the way the text was formulated confused people.

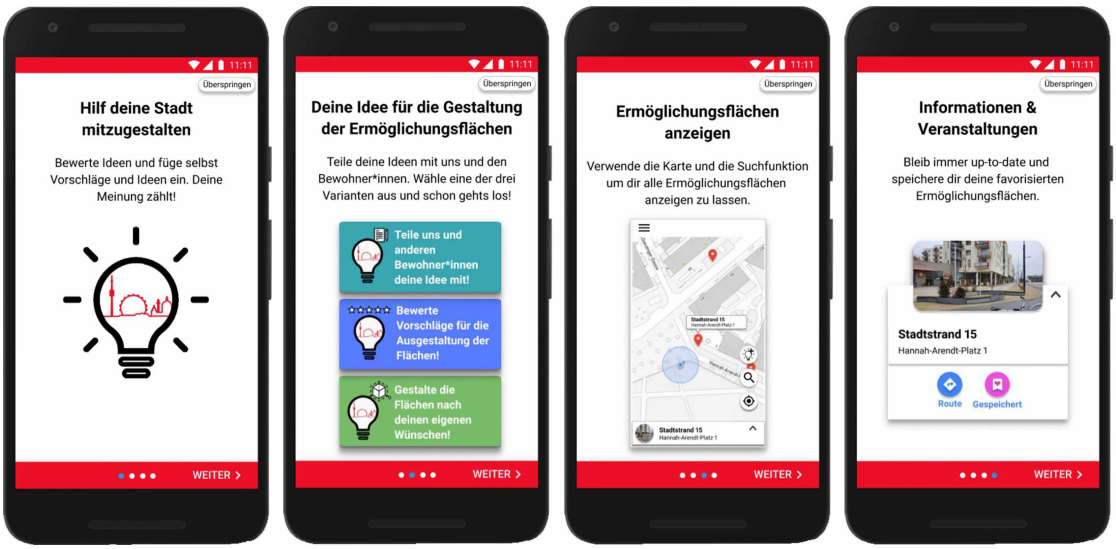
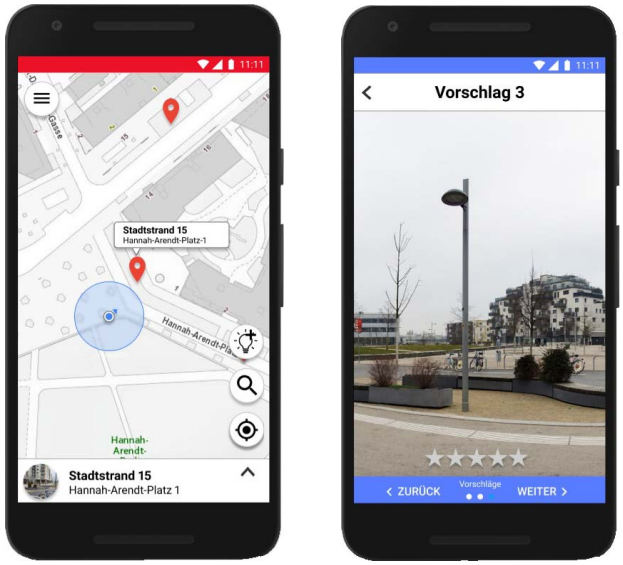


Figure 7.13: Onboarding. These four screens should explain to users what the app can be used for and what the main functionalities are.

Interactivity. For two test persons it was not clear that the map and the pictures of the designed area were interactive elements (see Figure 7.14). They noted that they

would not have thought that they could “move around” in the space or use the map like Google Maps to explore the wider surroundings. It was noted that if this continued to be the case as the app continued to develop, an additional icon or explanatory text should be added.



(a) Maps screen. The orange location icons visualize the Ermöglichungsflächen

(b) Idea 2 and 3. “Experience” the space

Figure 7.14: Interactivity. The test persons did not understand with these screens that the map as well as the picture are interactive.

Calendar. One tester expressed the desire to be able to export the event details or transfer them to his/her own calendar.

***Ermöglichungsflächen* and Maps Screen.** For one test person it was not clear that the orange location icons on the map (see Figure 7.14a) were *Ermöglichungsflächen*. It was noted that if this ambiguity remained during the further development of the app, the areas should be marked differently (possibly by marking the whole outline of the *Ermöglichungsfläche* and adding the Idea icon).

Feedback & Concluding Questions

After finishing the evaluation, the test persons were asked if they would use the app and which citizen participation and co-creation variant they would prefer to use. This time all six test persons indicated that they would use the app. One participant who had already evaluated the low-fi prototype changed his/her mind and would now use the app. The testers reported that the structure of the app was logical and that it was easy to

use. It worked well for them to give their own ideas and opinions, and it was clearly arranged for them. Another positive aspect was that they could always stay up-to-date by being informed about current events, changes in proposals, the results of reviews of design ideas and also get to know the *Ermöglichungsflächen*. When asked which idea they would prefer, all testers indicated that they would like to keep all of them. They liked the option to decide how they wanted to express their opinion and did not want to limit themselves to one functionality.

7.6 Final Prototype

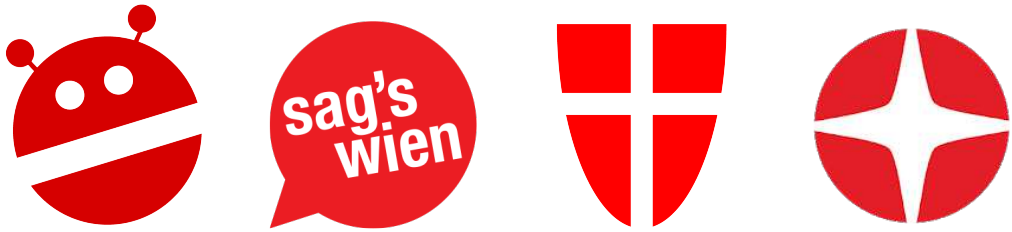
In this section the final prototype as well as the whole developed concept is explained in more detail. In a first step, the creation of the CI is explained. Afterwards, the individual functionalities of the app and the concept around the app are explained in more detail.

7.6.1 Corporate Identity

The CI for the app includes the color scheme of the app, the logo and the chosen font.

Color

First, the color scheme for the app was developed. In the future the app should be adopted and used by the City of Vienna, so the color scheme was chosen to match the city's existing apps (see Figure 7.15). The City of Vienna offers three different apps, (WienBot, *Sags's Wien*, Stadt Wien live-App), and Wiener Linien offers the app WienMobil. These



(a) WienBot [151] *(b) Sag's Wien [151]* *(c) Stadt Wien live-App [151]* *(d) WienMobil [75]*

Figure 7.15: Logos of the apps of the City of Vienna and Wiener Linien

apps all use the same color scheme, and the main color is red. Additionally, the colors blue, gray, white and black are used. For the app *Ermöglichungsflächen - Wien selbst gestalten*, seven basic colors were therefore used (see Figure 7.16), with red being the primary color of the app. Red is used for most of the elements (i.e., for buttons, steppers, text fields and headers). Furthermore, each design idea was given its own color (see the last three colors of Figure 7.16). In total the app has four different primary colors. This should make it easier for users to identify which citizen participation or co-creation idea

they are currently using. These additional colors were chosen so that the white font is easy to read on them and they are pleasant without distracting from the content.

The color gray is used for inactive elements as well as for text providing additional information and annotations. The colors blue and pink are used for accents. The color blue is used for the dots in the steppers and links. The color pink is used to indicate that an *Ermöglichungsfläche* belongs to the saved areas.

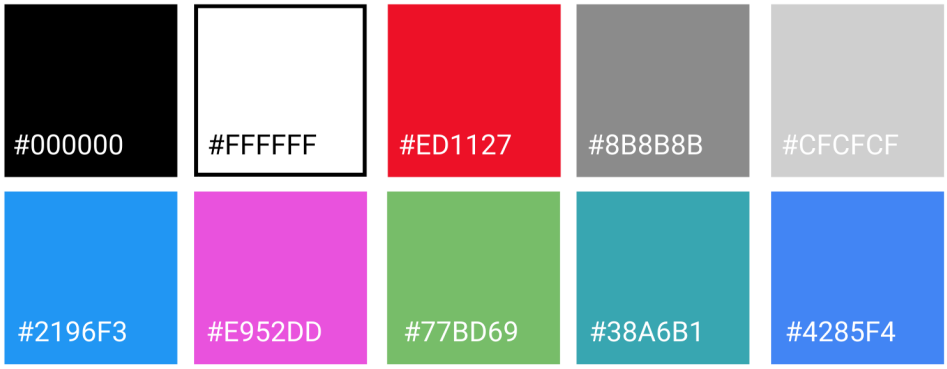


Figure 7.16: Colors used in the app

Logo

When creating the logo, the first step was to identify elements that could be associated with the idea of the app. A light bulb, a community, the collective design (symbolized by hands), location symbol and the skyline of Vienna were proposed as elements. Different logos were created and then discussed with three evaluators. The light bulb was chosen as the best representation for the idea of the app. In addition, the community and the skyline of Vienna were found to be suitable representations for the idea of the app, with two people finding the skyline more suitable. The light bulb as well as the skyline were the two elements used for further development of the logo.

Three additional variants of the logo were developed using different light bulbs and skylines. These variants were again discussed with the three evaluators. A thinner skyline as well as a specific light bulb were chosen as favorites. A new skyline was created, and the final logo was designed. In Figure 7.17 the final logo for the app to design the *Ermöglichungsflächen* is visualized. The skyline symbolizes the City of Vienna and that the app allows people to design something for the city itself and also for everybody living in this city. The light bulb symbolizes the ideas of the residents for the City of Vienna. To pick up the main color of the app, the skyline is colored in the same red.

Font

For the creation of the hi-fi prototype, the font Roboto was chosen. This is a very neutral and sans-serif font that was developed by Google for the operating system Android. Two

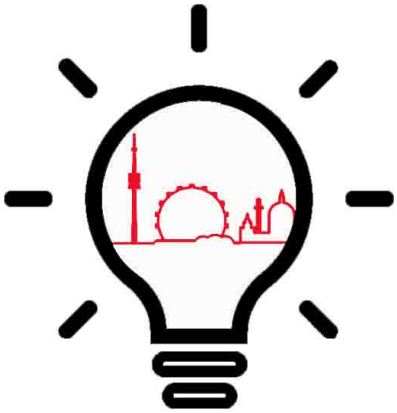
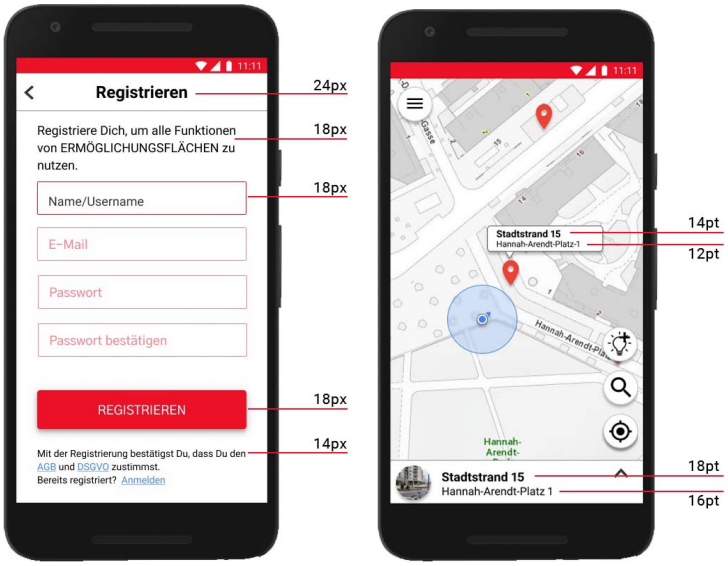


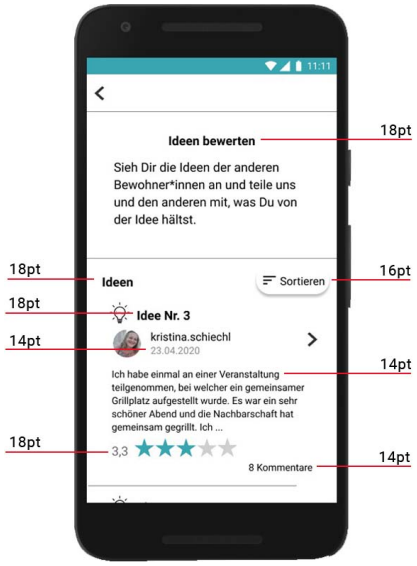
Figure 7.17: The final logo for the app Ermöglichungsflächen - Wien gemeinsam gestalten

Figure 7.18: Different text styles for the design of the hi-fi prototype

font weights are used: Roboto Regular and Roboto Bold. Furthermore, five different font sizes are used for the different screens. With all the variations between Roboto Regular and Roboto Bold a total of nine text styles were defined in the prototype and are used in the final app (see Figure 7.18). In Figure 7.19 three screens of the hi-fi prototype are shown. These show the different text styles and font sizes in detail.



(a) Registration Screen *(b) Maps screen*

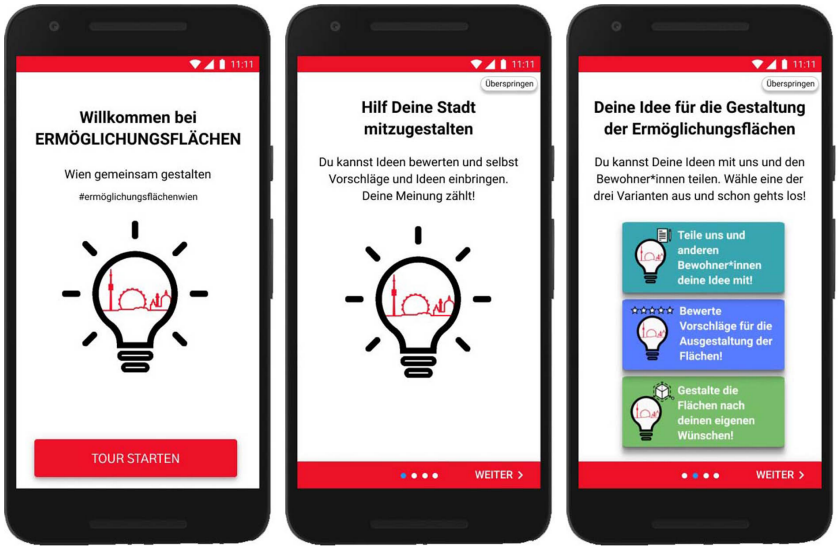


(c) Idea 2 - Write down your own idea

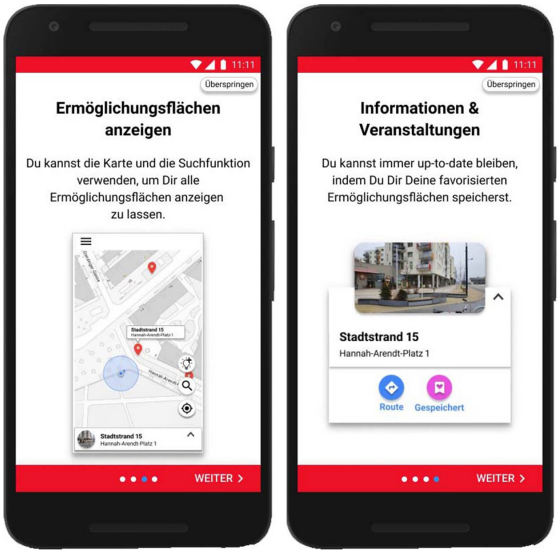
Figure 7.19: The different font styles in three screens of the hi-fi prototype

7.6.2 The Final Product

In this section, the final app as well as all the functionalities and screens are explained.



(a)



(b)

Figure 7.20: Final product. The start and onboarding screens

The First Use of the App

The first time the app is opened, the user is presented with a start screen, and then a tour through the functionality of the app begins (see Figure 7.20). The most important functions are explained so that the users know from the beginning what they can do with the app and what functionality is available.

After the tour is completed, users can log in or create a new account (see Figure 7.21).

The scenario presented here represents the first use of the app, and therefore, a new account is created. When registering themselves, users can choose between three options, either they log in with a Google or Facebook Account or they log in with their email address and password. The user fills in the data, and the app checks whether the two passwords entered match. After completing the registration, the user is taken directly to the home screen.

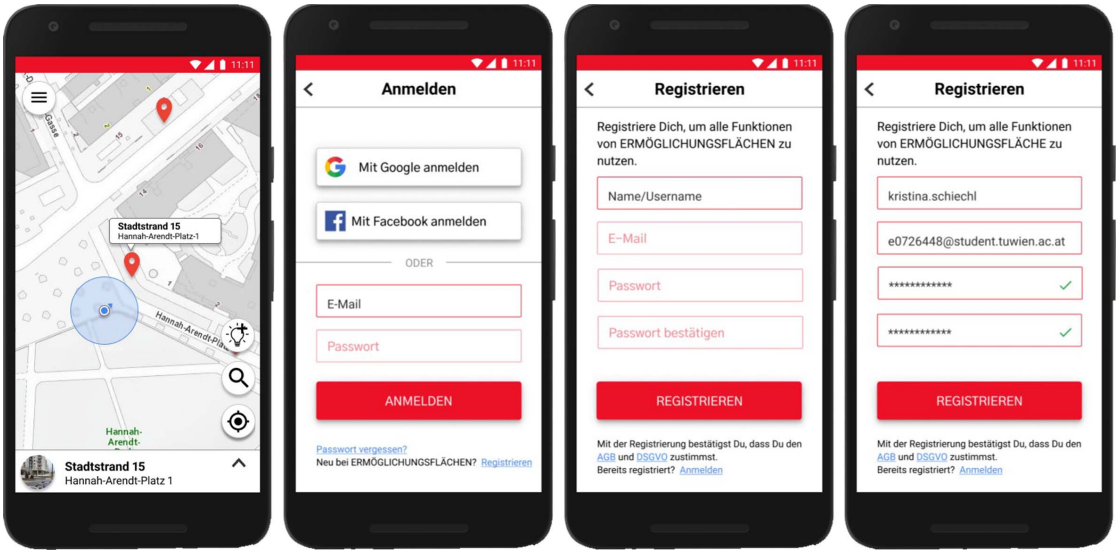


Figure 7.21: Final product. The user can register to use all functions of the app and when the registration is complete, the user is taken to the home screen.

Home Screen

The home screen (see first screen of Figure 7.21) shows the user all *Ermöglichungsflächen* using the map and colorful location icons for the visualization of the areas. If the user's own location has been released, the nearest *Ermöglichungsfläche* is marked and highlighted with additional text in the map (name and address of the area). From this screen, further areas can be searched for (using the search icon displayed in the lower right-hand corner) or an idea can be added or evaluated (using the idea icon). If the user's location is not released, the user can click on the localization icon to display their own location on the map. Furthermore, the user can also view more information about the area by clicking on the arrow on the bottom of the screen. They also can click on the menu button.

Menu.

In the menu the user can find the information about his/her account as well as access the search function, events, notifications, QR code scanner (which is placed on the *Ermöglichungsfläche*), help and FAQ, share the app and settings (see Figure 7.22).

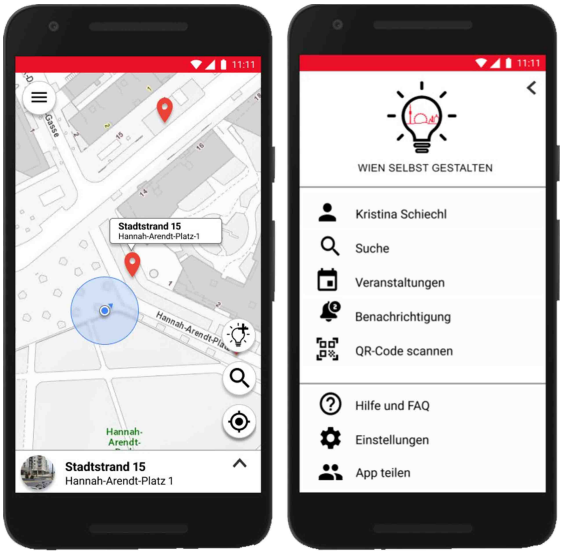


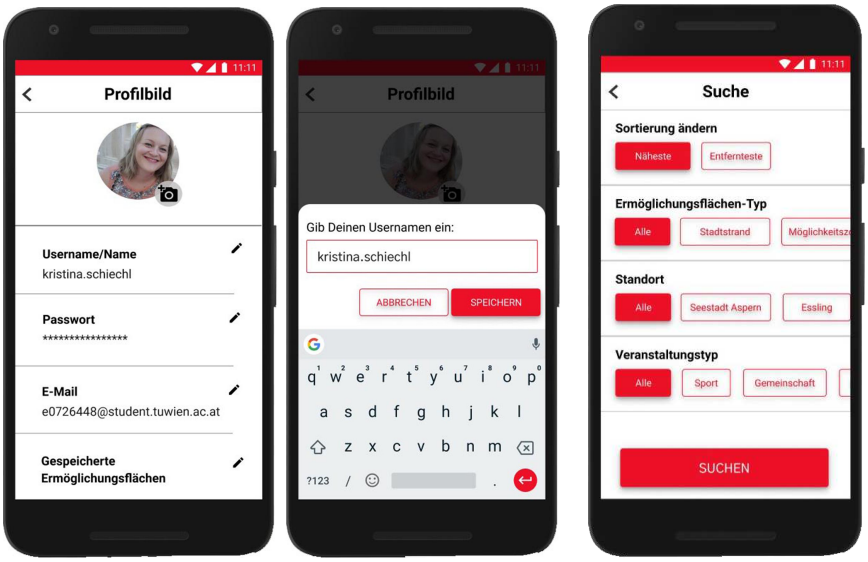
Figure 7.22: Final product. When the user clicks on the Menu button, the menu opens.

Account. In the account users see all the information that they have entered and can also edit this information by clicking on the pen (see Figure 7.23a). After clicking on the pen, the user can enter the new text and the overview is updated. The username/name as well as the uploaded image are displayed during the creation of an idea or a design proposal and during the evaluation. Users who do not want to provide their real name can choose a different username, and uploading an image is not mandatory. On this screen users find the email address they entered during registration, all saved *Ermöglichungsflächen*, the ratings they have made and all their uploaded ideas and suggestions. When editing the saved areas, the user sees an overview of the saved areas and can select or deselect them. For the ratings, users see an overview of the ratings they have made and can edit them here. The same option applies to the uploaded ideas and suggestions.

Search. With the help of the search function, the user can search for an *Ermöglichungsfläche* (see Figure 7.23b). The user can search for the nearest or the furthest area, an *Ermöglichungsflächen*-type (*Möglichkeitszone, Stadtstrand*), a location (Seestadt Aspern, Essling, Hannah-Arendt-Platz, etc.) or an event type (sport, community, music, etc.).

Event Calendar. With the help of the calendar, all events are displayed to the user. Clicking on a marked date displays an overview of the events stored on that day (see Figure 7.24). Furthermore, the filter can be used to choose which events are displayed.

Notifications. The notification screen (see Figure 7.25a) informs the user about everything that concerns the *Ermöglichungsflächen*, including new events, new meetings, results of ratings, new design proposals and more.



(a) Account *(b) Search*

Figure 7.23: Final product. Search and account

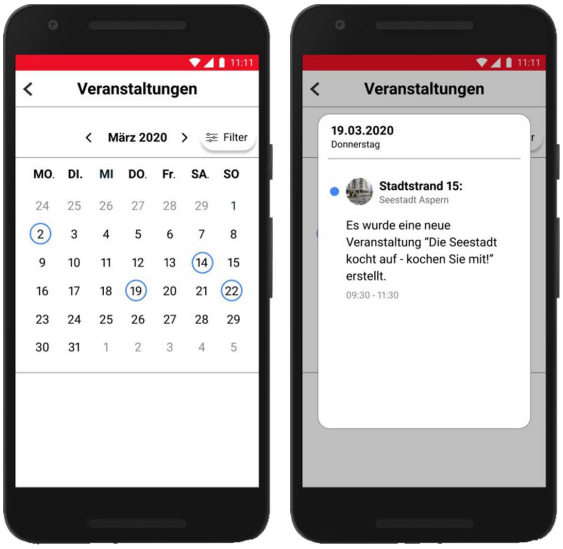
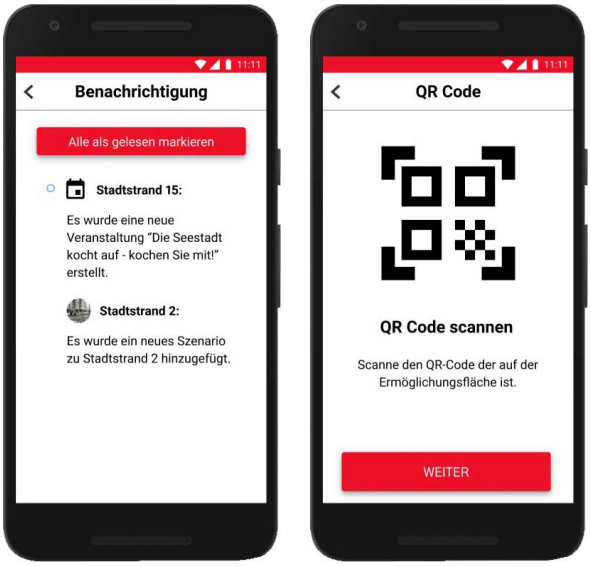


Figure 7.24: Final product. Calendar

Scanning QR-Code. A QR Code is attached to each *Ermöglichungsfläche*. The user can scan the QR Code (see Figure 7.25b) in order to open the information screens pertaining to this area. For example, if the user is at the *Ermöglichungsfläche* "*Stadtstrand 15*" and scans the QR Code, the information screen for "*Stadtstrand 15*" opens.



(a) Notifications *(b) Scanning QR-Code*

Figure 7.25: Final product. Menu

Help & FAQ. Help and FAQ displays a list of common, important questions to the user (see Figure 7.26). Examples of questions include: How do I change a rating? How do I add an idea? Do I get feedback on published ideas and design proposals? If the user clicks on the question, the answer to this question appears.

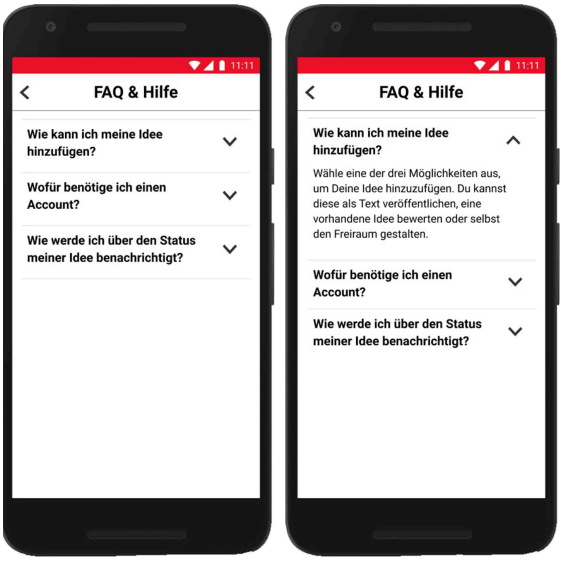
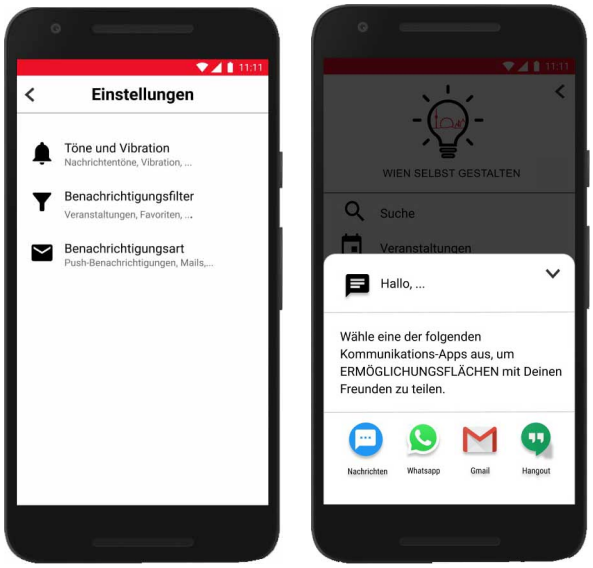


Figure 7.26: Final product: Help & FAQ

Settings. In the settings the user can define which tones and vibrations are used for notifications, what the user is notified about (*Ermöglichungsflächen*, locations, etc.) and how he/she is notified (push notification or email) (see Figure 7.27a).

Share the app. The user can share the app (see Figure 7.27b). A written message is provided, so the user only needs to select a communication app to send the invitation to the friend.



(a) Settings *(b) Invite friends*

Figure 7.27: Final product. Menu

Information - *Ermöglichungsfläche*

Information about the individual *Ermöglichungsflächen* can be viewed by the user. As previously mentioned, the user can click on the arrow icon at the bottom of the screen to display further information (see first screen of Figure 7.28). On the next screen, the user can save the space and will then automatically receive all information regarding this space, such as the addition of a new event, a new design proposal, meetings to discuss ideas and proposals and so on (see screens two and three of Figure 7.28). By clicking the arrow icon again, all available information for the area will appear (see Figure 7.29). A picture of the area is displayed, and by clicking on it, a 360 degree view opens, and the user can experience the area. Furthermore, the user can choose between the different participation and co-creation options on this screen. In addition, information about who is responsible for the area, the district, the number of squares and a floor plan of the area is displayed. With the help of the floor plan, it is possible to see how the area is equipped and what infrastructure is already there.

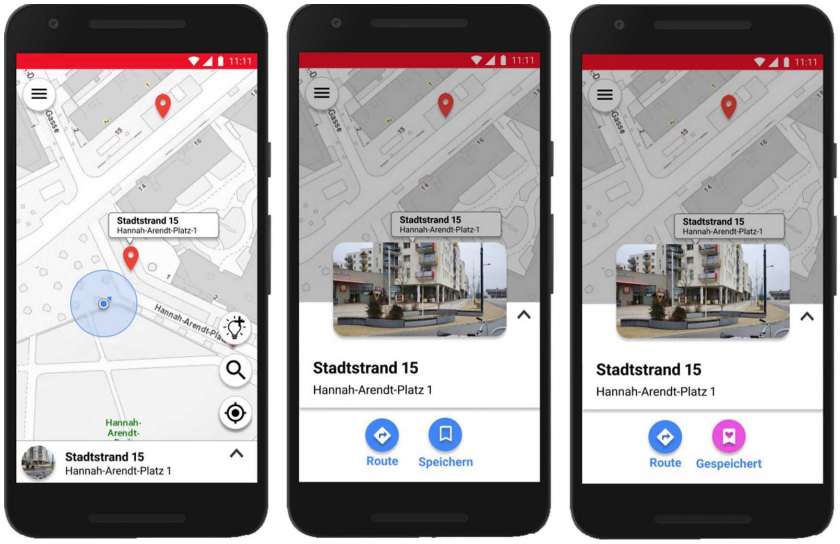


Figure 7.28: Final product. Information screens

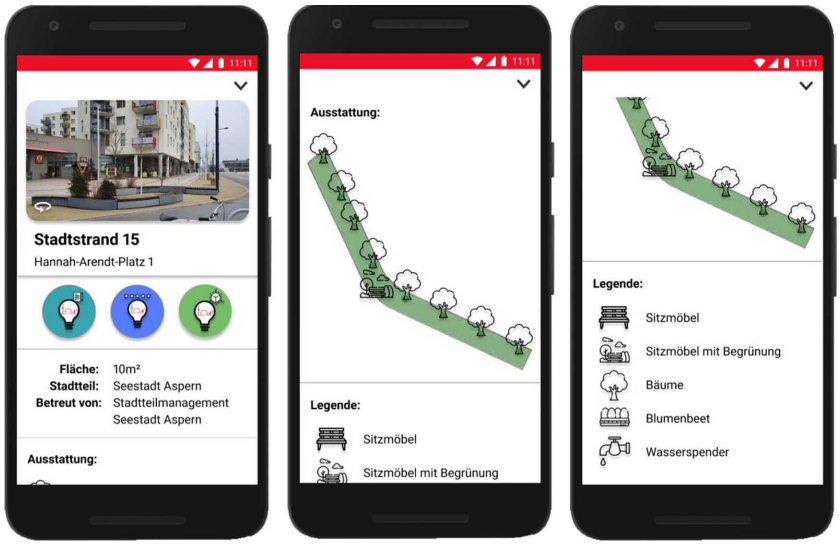


Figure 7.29: Final product. Information screens

Citizen Participation and Co-Creation

The user can access the individual participation and co-creation variants from the home screen or from the information on the *Ermöglichungsflächen*. Figure 7.30 visualizes the scenario in which the user has clicked on the idea icon, and the overview of the three variants opens. In order to facilitate orientation and comprehensibility, each variant is assigned its own logo and color.

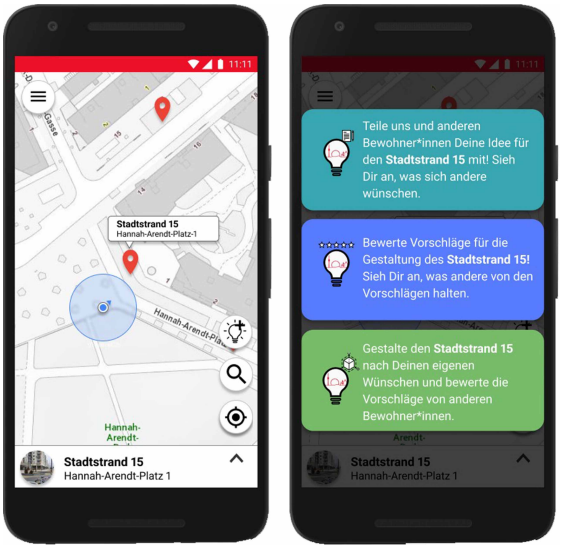


Figure 7.30: Final product. Citizen Participation and Co-Creation screen

Idea: Write down the Idea. By clicking on the first idea, the user gets a short explanation of how to add and review an idea. The first screen of Figure 7.31 shows the explanation of how an idea can be added. Now, by clicking the button "Add idea/*Idee hinzufügen*," a new screen appears, and the user can add his/her idea (see second screen of Figure 7.31). By clicking the "Post/*Posten*" button, the idea of the user gets posted, and the user returns to the start screen for this idea. To rate existing ideas, the user can scroll down (see first screen of Figure 7.32). Each uploaded idea has a unique number and shows who posted the idea and at what time. A short summary of the idea is provided to help the user form a first impression. The average rating of other users for this idea is shown at the end of the idea description. When rating an idea, a comment can be added. If the user has entered a comment, it can be found under "comments/*Kommentare*." Any idea can be opened to visualize the whole idea. After exploring the idea, the user can choose to rate it by awarding stars (see second screen of Figure 7.32). After choosing the number of stars, the user can enter a comment (see last screen of Figure 7.32).

Idea: Reviewing Different Design Options. The structure of this citizen participation and co-creation variant is similar to the previous idea except that in this case there is no option to create a new idea. Only existing design proposals are evaluated (see Figure 7.33). At the beginning the user sees a short explanation, and if he/she scrolls further down the different existing design proposals are displayed along with the average ratings and the related comments made by other users. Clicking on the design proposal opens it, and the user can experience the space and then rate it with stars and add a comment.

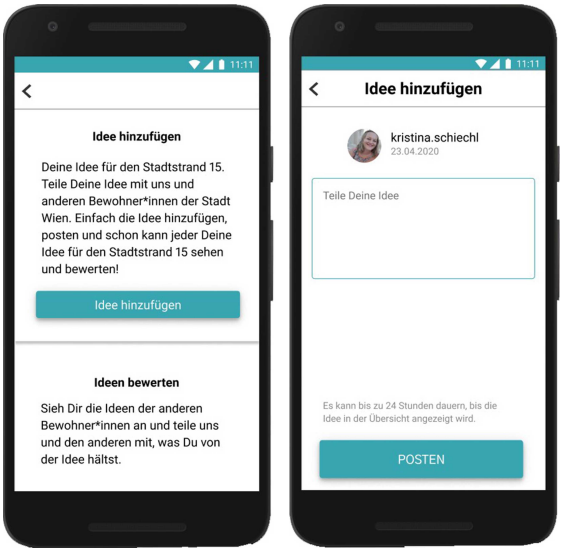


Figure 7.31: Finale product. Idea - Write down the Idea

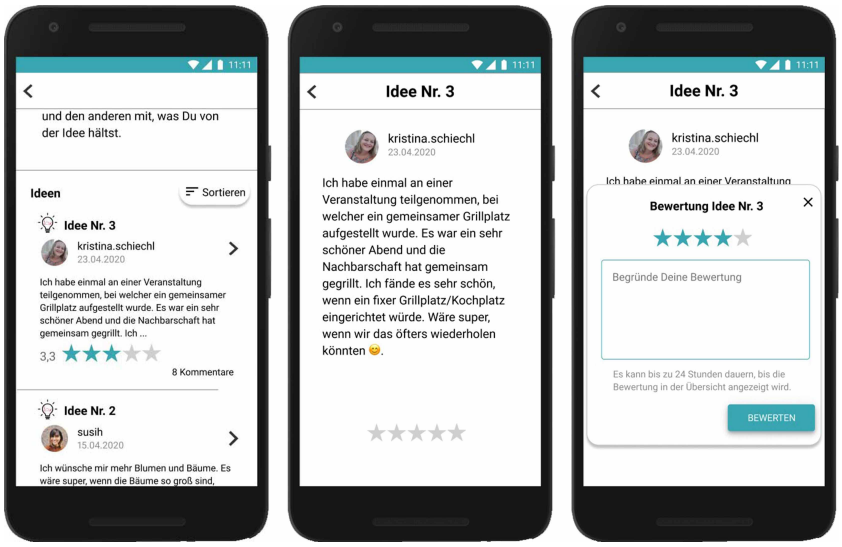


Figure 7.32: Finale product. Idea - Write down the Idea

Idea: Designing the *Ermöglichungsflächen.* The structure of this citizen and co-creation variant is the same as that of the first idea, but it also provides the ability to add objects to the space and move them around. Users can create their own design (see Figure 7.34 and 7.35) and evaluate design ideas from other users (see Figure 7.36). When creating an idea, one object can be selected at a time and experienced in the space. Users can move the object around and add more objects (+ button). When the user is finished with the design, the check button can be selected to start posting the design proposal. The evaluation of existing design proposals works the same way as in the previous idea.

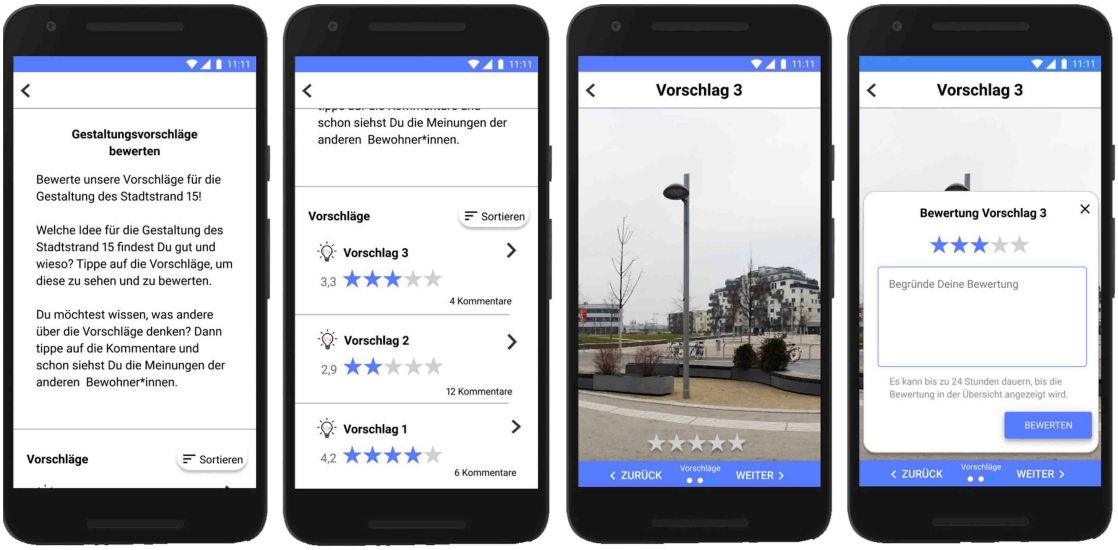


Figure 7.33: Final product. Idea: Reviewing Different Design Options

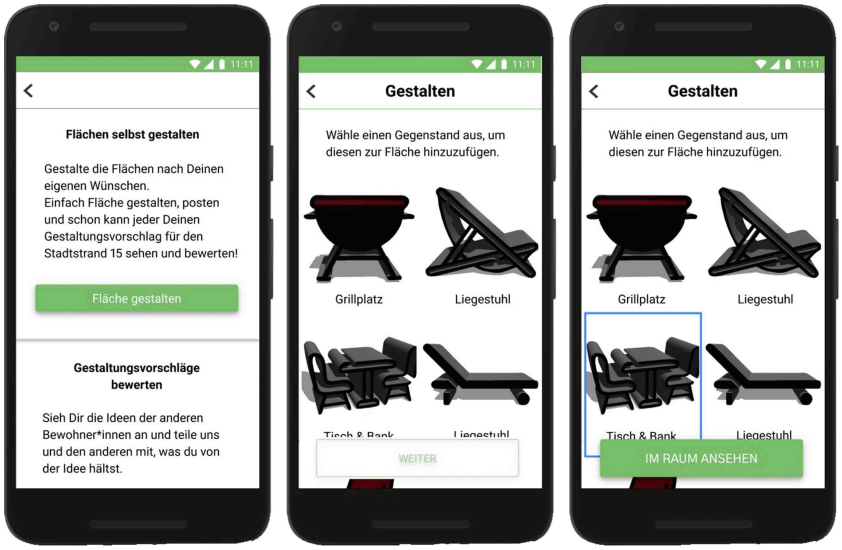


Figure 7.34: Final product. Idea: Designing the Ermöglichungsflächen

The Overall Concept

During the research and in the interviews with experts, it was mentioned that the areas are not marked, and many people do not know which areas belong to the *Ermöglichungsflächen*. It is therefore of great importance that they are marked, and the overall concept includes a proposal to mark the areas. This marking should include the logo of the app and the QR code for the respective area. In this way, residents will be able to find information about the areas, know which areas are marked as *Ermöglichungsflächen* and understand

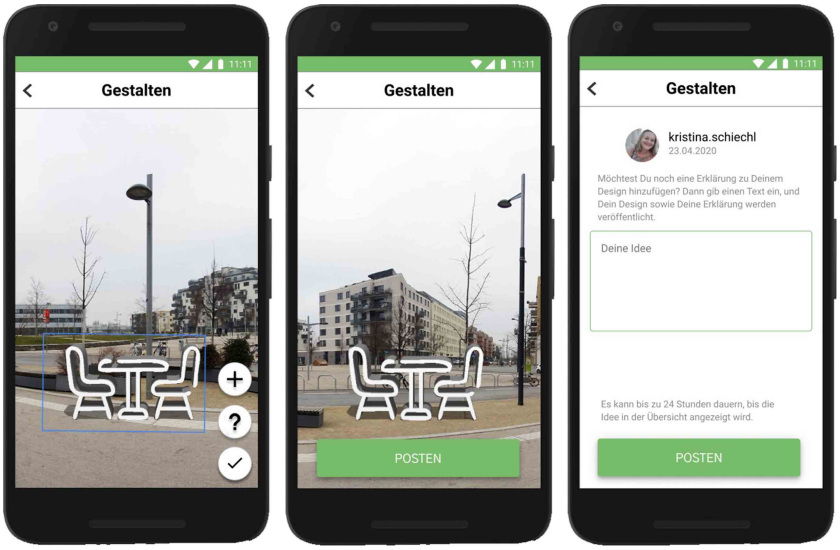


Figure 7.35: Final product. Idea: Designing the Ermöglichungsflächen

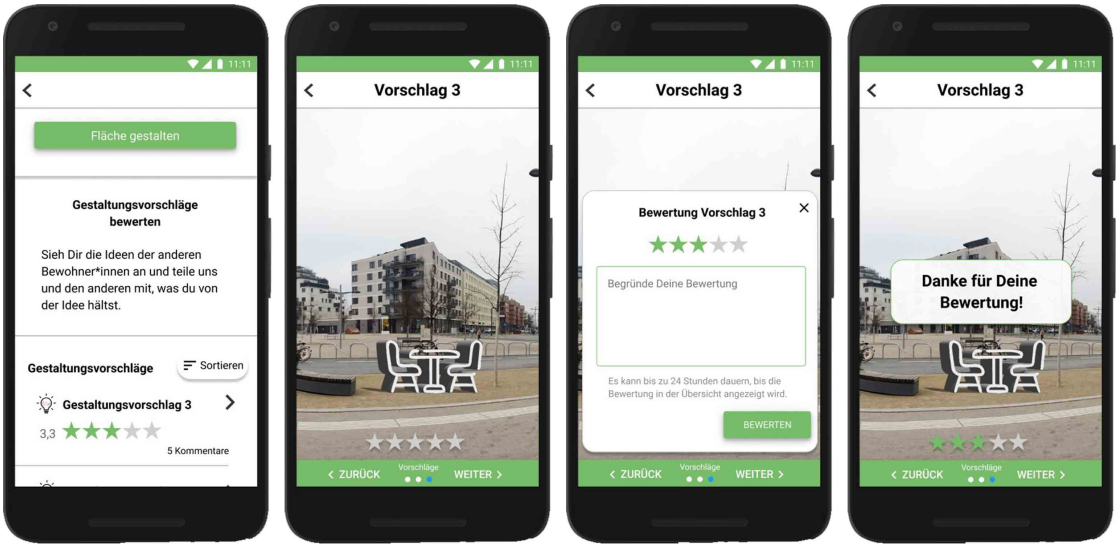


Figure 7.36: Final product. Idea: Designing the Ermöglichungsflächen

how they can participate in shaping, designing and appropriating them. The marking should not be too conspicuous or large, but it should be easy to recognize. It should help the residents to better identify the areas as *Ermöglichungsflächen*. In this way, the concept of *Ermöglichungsflächen* can be more effectively spread and made known.

Part III

Analysis & Future Work

CHAPTER 8

Analysis & Discussion

Increasing numbers of people are using the public spaces of Vienna. These areas are no longer seen only as transportation space, but now serve more for recreation and invite people to linger. The co-creation of public space has become increasingly important to the residents of Vienna. Public leaders are therefore endeavoring to involve residents more in the design of public space and to promote public participation. *Ermöglichungsflächen* represent a new strategy of the City of Vienna to involve the public and encourage them to participate in co-creation. *Ermöglichungsflächen* are open public spaces that are designed during the planning process of new neighborhoods, and they help strengthen the appropriation and co-design of new streets and places by the population. New districts have not emerged naturally in Vienna, and it is therefore of great importance that people are able to acquire open space and identify with their district. According to the "Specialized Concept for Public Space" of the City of Vienna, the residents of Seestadt Aspern should be making use of these areas one to two years after first occupancy in the district (first occupancy 2014). Such participation and appropriation has not taken place to date.

When planning a project or implementing a system in public space, it is not only the residents that should be considered, but also the city's existing guidelines and all the stakeholders involved. For example, the city itself consists of various magistrates, offices, and companies, and the wishes and regulations of these stakeholders must also be taken into account. The design of *Ermöglichungsflächen* is therefore an interdisciplinary task. In order to truly meet all wishes and requirements, expertise is needed in various fields, such as computer science, spatial planning, sociology, and psychology.

This chapter deals with the results of this thesis and interdisciplinary task, establishing a connection between the results and the literature. Furthermore, this chapter presents an overview of the preconditions that need to be met in order to implement a socio-technical system in the public space and how people can be made aware of and motivated to use the public space, and specifically the *Ermöglichungsflächen*, of Seestadt Aspern.

In addition, this chapter examines the technological solution that can support the above processes.

8.1 Preconditions to Create and Implement a System in Public Space

In this section the focus is on answering the first research question, namely *Which preconditions need to be established to create and implement a sustainable socio-technical system in a public space?*

In order to implement a system in the public space, the people-place-technology relationship needs to be examined. Urban informatics is a new research field that deals with this relationship. Foth states that urban informatics "requires a broad perspective across the triad of people, place and technology, and the associated disciplines of the social sciences (humanities and arts); computer sciences (and software engineering, ICTs); and spatial sciences (architecture, planning, and design)" [39, p. 6]. However, this alone is not enough; it is also necessary to comply with the guidelines of the city in which the development of a system takes place. Vienna strives for "good governance", which means establishing goal-oriented, partnership-based and transparent cooperation between all stakeholders who work to improve quality of life and sustainability. The development of a technical system in public space should therefore not be considered in isolation from the rules and regulations of the public space, but should respect them. The people, place, and technology triad is therefore extended by the governance process (see Figure 8.1). Before the system itself is developed, the various guidelines and responsibilities should be examined in detail.

8.1.1 Public Space of the City of Vienna

To implement a technical system in a public place it is necessary to know the rules and regulations that apply there. The first step of this thesis was therefore to take a closer look at the topic of urban development and the public space of the City of Vienna. When developing a system in the public space of Vienna, one should be aware that it is one of the fastest growing cities in Europe. Changes and developments should be used to make the city more livable, more social, more ecological, and more competitive. Furthermore, good governance is very important to the City of Vienna. It is therefore important to ensure that there is goal-oriented, partnership-based and transparent cooperation between all stakeholders. Stakeholders include the city itself, all participating magistrates, and the residents of the city.

In the course of the literature research and the expert interviews, it was found that public space is becoming increasingly important. Many residents of the City of Vienna do not own a balcony, and there are no communal areas for use except for atriums. The residents are therefore increasingly turning to the city's public space. The pressure on the design of this space is therefore increased. The public space must therefore be

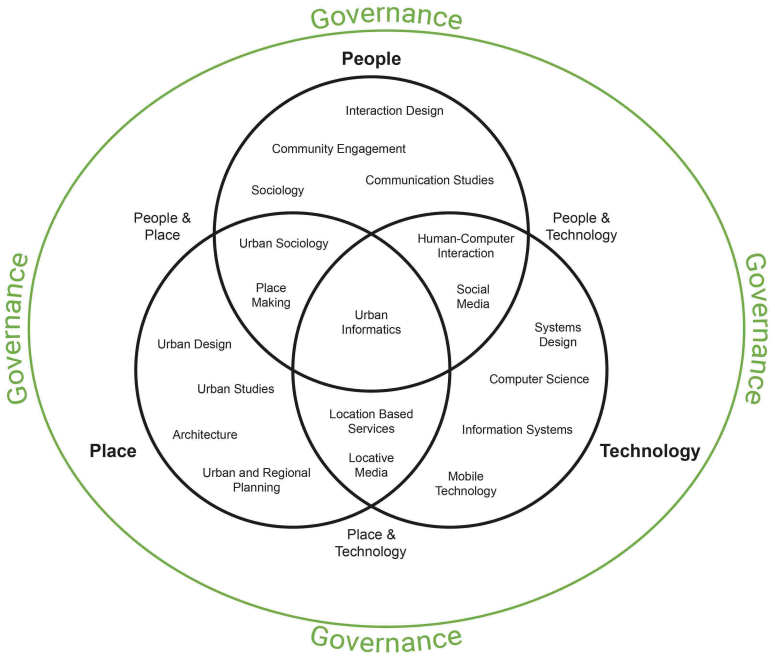


Figure 8.1: People, place, and technology extended by governance. Author's own representation after [37] and [36, p. 32]

designed in such a way that the all residents can use it as a third place. The City of Vienna has therefore defined five objectives to be borne in mind with the design and development of open public space: (1) Lively and Cosmopolitan, (2) Socially Just and Gender Equitable, (3) Educating and Activating, (4) Ecological and Robust, (5) Participatory and Identity-building. In summary, these points mean that public space can be used for different activities by everyone. No one should be excluded, and there should be no obligation to consume food or drinks in relation to such space. Public space should be developed in such a way that it allows for the participation of residents and thus promotes identity building.

These objectives must be taken into account when implementing a project in public space. In addition, it should be noted that the *Ermöglichungsflächen* of Seestadt Aspern correspond to the last point. The concepts of participation and identity building are therefore essential when developing a project or system in these areas. The technical system to be developed should motivate people to participate in the design of these areas, and identity building in the district should be enhanced as a result.

Information on the possibility of citizen participation and co-creation should be distributed to the residents of Vienna. If people know that they can use these areas and where they are, they are likely to be more easily accepted by the residents. The literature research, the interviews with experts, and the implementation of the survey revealed that relatively few people know which areas these are and where they are located. Of the 64 people

questioned in the survey, 19 knew the names of these areas in connection with the tool *Ermöglichungsflächen* of the City of Vienna. It is very important that a map be created, or that the locations of these areas be designated in the official maps. This will ensure that people know where these areas are and will start to make use of them over time.

8.1.2 Responsible Magistrates & Departments

In the "Specialized Concept For Public Space", the City of Vienna provides examples of the magistrates and departments responsible for the general planning and management of public space. In general, these are MA5 (Finance), MA7 (Culture), MA13 (Youth), MA17 (Diversity), MA18 (Urban Planning), MA19 (Architecture), MA25 (Area Management), MA28 (Road Construction), MA68 (Fire Department), Municipal Directorate, Construction Directorate, Climate Protection Coordinator, Vienna Environmental Ombudsman, Vienna Health Promotion, Lokale Agenda 21, FSW Team Focus, Vienna Chamber of Labor, and the police. Different magistrates are responsible for different areas of public space. For example, in the case of temporary events, construction dimensions, temporary markets, or demonstrations, the municipal authorities MA13 (Youth), MA28 (Road Construction), MA36 (Events), MA46 (Traffic), MA59 (Market Office) and the police are responsible. Art installations are another example. In this case, the Kunst im öffentlichen Raum Wien (KÖR) GmbH (Funding, Consulting), MA7 (Culture), MA19 (Architecture), MA28 (Road Construction), MA33 (Lighting), MA37 (Building police), MA46 (Traffic), MBA (District Office) and the District Representative are responsible. Figure 1.1 – which appears in the Introduction, Chapter 1 – presents the various responsible magistrates.

When developing a system in the public space, it is therefore necessary to deal with the responsible magistrates and departments of the City of Vienna. From interviews with the experts it was possible to identify the magistrates responsible for the *Ermöglichungsflächen* in Seestadt Aspern: MA28 (Roads), MA46 (Traffic), MA42 (Urban Green Spaces), and MA19 (Architecture). The approval of these magistrates must be obtained for any project or event to take place on these sites.

8.1.3 Submission & Approval of a Project in Public Space

As the literature review and the results of the expert interviews have revealed, not every project can be implemented in public space. The guidelines must be adhered to. If one considers the establishment of a parklet in public space, it must be located in front of the applicant's own front door. Moreover, a parklet must be consumption-free and for the use of all citizens. It should invite people to use it and be a third place for the residents of the City of Vienna.

For the establishment of parklets, there is a document that makes it easier for the residents to submit the project to the City of Vienna. It sets out the guidelines that have to be complied with and presents the information that is needed to build a parklet. However, there is no such document for the creation and implementation of a project on the *Ermöglichungsflächen*. The experts have indicated that the proper submission of a

project requires experience. Over time, a planner/designer/researcher/resident will know which projects can be submitted and what guidelines must be followed. The experts have stated that it is important for someone to communicate the rules to the residents. If a citizen does not have access to moderation and assistance from someone who is responsible for these areas, implementation is hardly possible.

The submission of a project takes approximately six weeks. However, this only applies if the project already complies with the guidelines of the City of Vienna. It was indicated during the expert interviews that people submit projects to the City of Vienna without having studied the guidelines in advance. The projects are rejected and the people think that their project is not feasible. In many cases, information is missing or changing certain information would enable a project to be approved. There are different organizations and companies that can support residents in the submission process – for example, the *Grätzloase*, the *Lokale Agenda*, the district management, or planning offices. These people can support the residents with the submission and help them to adapt it to the guidelines. The submission of a project on the *Ermöglichungsflächen* should be shortened or simplified according to the success criteria in the technical concept of public space. According to the experts, there is no such special submission procedure for *Ermöglichungsflächen* yet. In the case of the latter, once a project meets the guidelines, all the relevant documents are sent to MA46. The MA46 will invite all persons involved to a hearing on site. After this negotiation, the applicant receives the decision and the project can be implemented.

8.1.4 Ethnographic Approach

Foth et al. indicate that it "takes a transdisciplinary approach to understanding the city as an ecology that consists of technological, social, and architectural layers" [38, p. 4]. An urban informatics study should always start with the context of use. The researcher should examine the place itself and the people who use it. In order to investigate and observe the people who use a place and to understand the context of use, an ethnographic approach can help. In the context of design, ethnography helps "to develop a thorough understanding of current work practices as a basis for the design of computer support" [114, p. 1]. Menezes et al. state that "urban ethnography brings together a number of perspectives and approaches to deal with cultural and social aspects of urban life, and as such it is able to provide an integrated methodological framework for the study of technology-public space relationship" [79, p. 1]. Furthermore, they state that the ethnographic approach provides an in-depth insight and facilitates a better understanding of existing phenomena. Seeburger et al. [113] and Menezes et al. [79] have implemented and defined an ethnographic approach to study the relationship between people, place and technology. These two approaches form the basis for the development of the prototype in this thesis. An understanding of the people (the residents of the City of Vienna) as well as of the public space (the public space in Vienna and especially the *Ermöglichungsflächen* of Seestadt Aspern) was gained with the help of these approaches. In this way it was possible to determine what the residents of the City of Vienna need in order to become aware of this public space and which technological solution can support this process.

8.2 Awareness of and Motivation to Use Public Space

This section focuses on answering the second research question, namely *How can people be made aware and motivated to use public space in a sustainable way?*

Many people in the City of Vienna are not familiar with the tool "*Ermöglichungsflächen*". This was evident from the interviews, surveys, and expert interviews. They do not know where these areas are, what can be done on them, or how they can be used. *Ermöglichungsflächen* are a concept that enables the residents of Vienna to appropriate certain areas and create an identity for their neighborhood. During the course of this research it was found that people do not use these areas. It should therefore be established why these areas are not used and how they can be changed. To answer this question the topics of placemaking, participation, appropriation and co-creation were discussed, because the connection between people and place and the motivation of the residents to participate in the design has to be considered more closely.

8.2.1 Participation, Appropriation and Co-Creation

In general, the term participation can be understood as involvement in the sense of taking part and participating [85]. Semantically, this can be understood as either an active or as a passive role. On the one hand, people can participate by acting, and on the other, they can be given a part to play. Exactly this information was also shared by the experts. On the one hand, the residents of the City of Vienna want to have the possibility to actively participate in the shaping of something, but they also want to have the possibility to observe the events. There are different ways to involve people. The City of Vienna has defined three different intensity levels of participation: (1) informative participation, (2) consultative participation, and (3) cooperative participation. In the first variant, citizens receive information about what is currently happening, and this can therefore be understood as one-way communication. In the second variant, the residents can express their opinion on something, but it is not certain that this opinion will be taken into account. This is seen as two-way communication. In the third variant, there is cooperation between all those involved. The project is designed jointly and can be understood as a multi-way communication. The design of the *Ermöglichungsflächen* has a cooperative character. The residents can participate in the design and there is an exchange between all stakeholders. According to the expert interviews, the residents of the City of Vienna will be involved and participate in the design. Projects and events are planned to motivate people to appropriate and co-create these areas. Another expert stated that the appropriation process can take several years and that this process should therefore be actively supported. According to Bader [12], the process of appropriation is an active one, which means "that the social conditions, meanings, competences etc. are not automatically internalized and absorbed, but individually worked on and processed." People must actively deal with their environment, and this means an appropriation of the material and symbolic culture [59, 109]. With the help of small projects and the active support of experts, an appropriation of the *Ermöglichungsflächen* can encourage

people to use them and make them aware of the public space.

8.2.2 Placemaking

Placemaking deals with the connection between people and place. Cities should be designed for people and not just for cars. Creating an inviting public space is important for the residents of a neighborhood. In designing public space, it is essential to examine the place, listen to the people who live, play, or work there and ask questions to find out what they want and need. This information can then be used to "create a common vision for that place" and create communities that "are more socially, physically, and economically viable" [88, 106]. This is the reason why placemaking forms the basis for making people aware of the areas and motivates them to use them.

The expert interviews have demonstrated that people currently perceive the *Ermöglichungsflächen* very negatively. They feel very disturbed by the water-bound sand surface, because the wind blows very strongly in Seestadt Aspern and sand is blown into the shops and apartments. One of the results of the survey was that people want these areas to be transformed. They should become greener. The residents want trees, plants, and flowers. In addition, the areas should be made more comfortable and inviting; residents should feel they want to stay and relax.

The team at PPS have been working for years on the improvement and revitalization of communities, and have developed 11 principles to support this process. These principles provide a guideline for communities to "(1) Integrate diverse opinions into a cohesive vision, (2) translate that vision into a plan and program of uses, and (3) ensure the sustainable implementation of the plan." With the help of these 11 principles, various stakeholders can be involved in the process. Different opinions can be taken into account in the further development of the place, thus creating a public place that brings added value to all stakeholders. Searching for partners, involving the citizens, observing the place, its surroundings and the people, creating a vision for the place, carrying out small projects, and creating and triggering a triangulation process are the basis of this process.

These statements were also made in the expert interviews. Involving the residents in the process is of great importance. It is through projects and events that the district management tries to make residents aware of the *Ermöglichungsfläche* and explain their functionality and purpose through these projects. The *Grätzloase* supports and motivates the residents to self-empowerment and tries to inform them about the processes of the city. In recent years, more frequent attempts have therefore been made to incorporate the views of the residents in the design.

In order to turn a place into a successful place, a personal meaning for the particular place must be created. PPS states, that "public spaces should become places". According to Garagnani et al. [42], different communities create personal meaning in different contexts. In creating a public place, the various communities involved should be identified and encouraged to take ownership of the creation process [33]. This statement was also made by the experts. Having a good mixture of people makes it more inviting for the residents

to work together to create it together. Places are meant to enable social and economic exchange and should comfortably make it possible to meet friends and to discover and observe different cultures [106, 88]. For years, PPS tried to define what makes a place successful, and they ultimately identified four characteristics: a place has to be accessible, comfortable, sociable, and attract people to carry out activities there. It was precisely these characteristics that were identified during the survey evaluation. The residents define a good place as a place that is easily accessible and open to everyone. The place must invite people to stay, and the residents of the City of Vienna want more green spaces, more trees, more plants, comfortable seating and a good balance between green and sealed areas (e.g., asphalt, cement, cobblestone). Furthermore, the public space should not only offer enough room to sit and linger, but should also be versatile in its use. The open space should be designed for families, singles and groups. In addition, it should provide space for exercise, entertainment, and other activities. Above all, many residents want the opportunity to interact and communicate with other residents. A good public place should promote this aspect by providing the opportunity for people to meet other people. It should also be possible to observe the urban activity.

These results demonstrate that the four characteristics of a good place as well as the 11 principles of placemaking from PPS should be considered when designing a place. With the help of the placemaking process for redesigning the *Ermöglichungsflächen* or by taking into account the wishes of the residents, the residents can be made aware of the areas and motivated to use them.

8.3 Technological Solution to Support these Processes and Its Functionalities

In this section the focus is on answering the third and last research question, namely *Which technological solution can support these processes and what functionalities should such a technological solution have?*

Since the beginning of urban informatics, researchers have increasingly been dealing with the connection between people, place, and technology. These are no longer considered separately but in conjunction with each other. It is only by understanding the people who use a place that a technology can be developed that adds value to the people and respects the rules and norms of the place. Cyberparks is a project that deals with this topic from different perspectives and the standpoints of different disciplines. Researchers from all over the world and from different disciplines are working together on this connection. For Seeburger et al. [113], urban informatics takes a closer look at multimedia extensions in the urban field. They want to use technology to influence and create user experience for public urban places. The attractiveness of a public space can be increased with the help of technology [6].

Technology can therefore be used to promote placemaking and create a sense of place. Abdel-Aziz et al. state that it is important that new social places are created “by giving

new media a role in place-making" [6, p. 489]. For them, information technologies that enable the creation of new social places and give new dimensions and a new layer to public spaces in various domains include wi-fi networks, media facades, interactive public displays, and smart mobile phone applications in public space. The new dimensions can be introduced to the domains of: (1) culture and art, (2) education, (3) planning and design, (4) games and entertainment, and (5) information and communication. Kjeldskov and Paay point out that "adding a digital layer to the existing physical and social layers could facilitate new forms of interaction that reshape urban life" [71, p. 60][113, p. 118].

The literature review has revealed that technology can be used to support the above processes. Therefore, the technological solution enables the planning and design of the *Ermöglichungsflächen* and adds a digital layer on the existing physical (space/place) and social layers (exchange between all stakeholders).

8.3.1 Functionalities of the Technological Solution

The first step was to establish which functionalities could support these processes: How do the preconditions to building a system or a project in public space influence the creation of a technical solution? Moreover, how can the inhabitants be made aware of and encouraged to use the *Ermöglichungsflächen* at Seestadt Aspern?

The technological system must have the following characteristics:

- Information about the *Ermöglichungsflächen* must be displayed. This includes what the areas look like and where they are located.
- The submission of ideas must be made easier. Residents should be able to contribute their ideas immediately, without having to make an official submission to the City of Vienna and without having to deal with the entire process and guidelines in advance.
- Enable an exchange between all stakeholders. Stakeholders include the City of Vienna, the residents of the city, and all companies and organizations involved in the management and design of these areas. For example, there should be exchanges between residents themselves, as well as an exchange between residents and the city. Cooperative participation as well as the highest level of participation should be facilitated with the help of this technical solution.
- Different possibilities for the design and submission of ideas should be available (especially bottom-up possibilities – initiated and self-organized by the citizens).
- The technical solution should make it possible to ascertain what the residents of the City of Vienna want and how many people have the same or similar wishes.
- Appropriation of place and placemaking should be encouraged.
- The guidelines and regulations of the city should be made more transparent.

- Influence and create experience for public urban places.

8.3.2 The Technological Solution

The technological solution developed in this thesis implements all the above functionalities. During the literature review, various projects were identified in Vienna that enable citizens to participate in the design of public space, thus promoting citizen participation. However, only two of these projects enable citizens to submit their ideas to the City of Vienna with the help of an online platform: WOW - mach mit (see section 3.6.4) and CityMaking! *Wien* (see section 2.3.5). Other projects that enable bottom-up participation include *Grätzloase, Wien gestalten - Beteiligung in Wien, Garteln ums Eck, #kommraus - Forum Öffentlichen Raum, and Wien wird WOW.*

To the best of the author's knowledge, no existing technological solution deals with the *Ermöglichungsflächen* of the City of Vienna and the concept of these areas. During the research and the expert interviews, further platforms and apps were considered. The AvaLinn app allows people to give their opinions and rate ideas from other people and ideas from the city itself. The Dipas platform allows residents to access a digital map and give localized feedback on specific projects. Smarticipate enables citizens to access and understand the city's data. This project enables citizens to be involved in the decision-making process and the city itself gains insight into the wishes and ideas of its residents. In this way, the citizens assume an active role in the planning of the city. Studio Dietikon allows residents to share their ideas and interact with others.

The developed technological solution is a combination of the various platforms and apps. It supports the visualization as well as the location of the *Ermöglichungsflächen*. It offers different top-down and bottom-up participation variants, enables the exchange of information and opinions between all stakeholders involved, and makes the city regulations more transparent. During the tests, both the idea and the construction of the app were evaluated very positively by the residents of Vienna. For them, it was very helpful that they could view the locations of the areas as well as the areas themselves. Another positive aspect was that they can always remain up-to-date by being informed about current events, changes in proposals, the results of reviews of design ideas, and can get to know the *Ermöglichungsflächen*. Furthermore, it was positively noted that there are different variants to submit an idea. The app supports two bottom-up and one top-down participation approaches.

CHAPTER 9

Future Work & Limitations

This chapter deals with the limitations of this thesis and possible future work.

9.1 Limitations

This section discusses possible limitations of the thesis. During the literature search, only publications to which the author had online or analog access were included. Furthermore, only publications in German or English were considered; all others were excluded from the search. In the applied user experience research methods, persons living in the City of Vienna were investigated. The survey was carried out with 64 participants, 21 of whom lived in Seestadt Aspern. Since the *Ermöglichungsflächen* are currently only implemented in Seestadt Aspern, the sample size should be increased in the next survey to check whether the generalization of the data is correct. Further observations had to be cancelled due to the Covid-19 pandemic in 2020. At the outset of work on the thesis, several observations of the *Ermöglichungsflächen* at Seestadt Aspern had been planned. The behavior of the residents should have been observed on different days of the week and at different times of day. Furthermore, more personal contact with the residents of Seestadt Aspern should have been established to develop and test the technological solution to be implemented. The sample size for further testing should be increased to ascertain whether the technological solution is considered helpful by more people. Not only citizens, but also responsible officials of the City of Vienna should be involved in the development of the app.

9.2 Future Work

During the development of the overall concept of the final prototype, the marking of the *Ermöglichungsflächen* was discussed. Different possibilities with regard to how the logo and the QR code can be applied have to be investigated and coordinated with the

guidelines of the City of Vienna. It was established during the collection of data that the marking of these areas is of great importance.

Furthermore, consideration should be given to whether a quiz about the *Ermöglichungsflächen* should be created – similar to the quiz about the residential streets of Space and Place. This quiz should increase the interest in the areas and the residents should also be able to agree on the functionality and the rules for these areas. The knowledge can thus be conveyed to them in a playful way.

During the research, the rules and guidelines on which activities can be carried out in the *Ermöglichungsflächen* could be found out. Furthermore, it should be ascertained what the City of Vienna wants from these areas in the future. The rules and wishes for these areas should be communicated to the residents (the district management is already trying to do this).

The placemaking process of PPS should be applied to the *Ermöglichungsflächen*: identify stakeholders, evaluate space and identify issues, create a place vision, short-term experiments, long-term improvements (see Section 4.3).

The app should be implemented and realized. Technical solutions for individual participation ideas should be identified. Different variants that allow people to "experience the place" should be researched and tested in a new development step. The perception of the place and the feelings that this place evokes in the residents should be tested. At present, the perception is negative, and this should change. Bringing in one's own design suggestions and ideas should change this.

APPENDIX A

Consent Forms

A.1 Prototyping

TU WIEN Informatics

Wien, am 08.04.2020

Einwilligungserklärung zur Erhebung und Verarbeitung personenbezogener Daten für wissenschaftliche Zwecke

Gegenstand des Forschungsprojekts und Grundlage der Einwilligungserklärung

1.1 Gegenstand und Beschreibung des Forschungsprojekts/Diplomarbeit

Das Interview fließt in die Erstellung einer Diplomarbeit an der Technischen Universität ein und die Ergebnisse werden für die Analyse und die Entwicklung eines Prototyps verwendet.

1.2 Interviewerin und Supervisorin

Frau Kristina Schiechl, BSc
E-Mail: e0726448@student.tuwien.ac.at

Associate Prof. Dipl.-Ing. Dr.techn. Hilda Tellioğlu
E-Mail: hilda.tellioglu@tuwien.ac.at

1.3 Art der personenbezogenen Daten der interviewten Person

Beruf, Ausbildung, Alter

1.4 Verarbeitung der gewonnen Daten

Das Interview wird mit einer Diktiergerät-App (Smartphone) aufgezeichnet. Weiters werden von der Interviewerin während des Interview Notizen gemacht.

Die Daten werden danach vom Interviewer analysiert. Alle Daten, sowohl Audioaufnahmen als auch Notizen, werden nur im Rahmen der Diplomarbeit verwendet. Die Daten werden nicht für Zwecke verwendet, für die diese nicht ausdrücklich erlaubt sind.

(a) Page 1

Einwilligungserklärung der betroffenen Person

Hiermit willige ich _____ ein, dass die im Rahmen des beschriebenen Forschungsprojekts erhobenen personenbezogenen Daten meiner Person in Form von Originalaufnahmen des Interviews durch die Interviewerin Frau Schiechl für die bezeichneten wissenschaftlichen Zwecke verarbeitet werden dürfen.

a) Ich habe die Informationen zu diesem Interview gelesen, verstanden und stimme der Teilnahme zu.

Ja / Nein

b) Ich bin damit einverstanden, dass Notizen während des Interviews gemacht werden.

Ja / Nein

c) Ich bin damit einverstanden, dass Audioaufnahmen gemacht werden.

Ja / Nein

e) Ich bin damit einverstanden, dass Audiomaterial im Rahmen der Diplomarbeit verwendet wird.

Ja / Nein

Hinweis: Ihre Einwilligung ist freiwillig. Sie können die Einwilligung ablehnen, ohne dass Ihnen dadurch irgendwelche Nachteile entstehen. Ihre Einwilligung können Sie jederzeit gegenüber der verantwortlichen Person widerrufen, mit der Folge, dass die Verarbeitung Ihrer personenbezogenen Daten, nach Maßgabe Ihrer Widerrufserklärung, durch diesen für die Zukunft unzulässig wird. Dies berührt die Rechtmäßigkeit der aufgrund der Einwilligung bis zum Widerruf erfolgten Verarbeitung jedoch nicht. Sie können alle Fragen ablehnen, die Sie nicht beantworten möchten. Es steht Ihnen frei, Ihre Einverständniserklärung innerhalb von 48 Stunden zurückzuziehen.

Fragen oder Anmerkungen

Prof. Dr. Hilda Tellioğlu ist die Supervisorin dieser Diplomarbeit. Wenn Sie Fragen, Bedenken oder Beschwerden bezüglich des Interviews oder der Art und Weise der Durchführung haben, wenden Sie sich bitte an Prof. Dr. Hilda Tellioğlu unter hilda.tellioglu@tuwien.ac.at.

Interviewter	Interviewer Kristina Schiechl
Datum,Unterschrift:	Datum,Unterschrift:
_____	08.04.2020, _____

(b) Page 2

Figure A.1: Consent form for Prototyping Methods

A.2 Expert Interviews

Einverständniserklärung

Bitte lesen Sie die folgenden Informationen sorgfältig durch bevor Sie das Dokument unterschreiben.

Hintergrund
Der Zweck dieses Interviews ist ein besseres Verständnis für das Thema der öffentlichen Plätze, im speziellen der Ermöglichungsflächen der Seestadt Aspern zu erhalten. Ziel der Masterarbeit ist es, herauszufinden wieso die Bewohner und Bewohnerinnen diese Flächen nicht benützen, sie auf diese aufmerksam zu machen und die Teilnahme an der Gestaltung dieser Flächen zu fördern. Dieses Interview fließt in die Erstellung der Masterarbeit ein und die Ergebnisse werden für die Analyse des Themas verwendet.

Aufnahme und Verarbeitung der Daten
Das Interview wird mit einem Smartphone aufgezeichnet und anschließend transkribiert. Weiters werden während des Interviews Notizen gemacht.
Die Daten werden danach von der Interviewerin analysiert. Alle Daten, sowohl Audioaufnahmen als auch Notizen werden nicht missbräuchlich verwendet und nur für den Zweck verwendet, für welchen diese ausdrücklich erlaubt sind.

Kontaktdaten
Das Interview wird von Fr. Kristina Schiechl durchgeführt:

Kristina Schiechl
E-Mail: e0726448@student.tuwien.ac.at
Tel: +43 664 9959487

Associate Prof. Dipl.-Ing. Dr.techn. Hilda Tellioğlu
E-Mail: hilda.tellioglu@tuwien.ac.at

Ihre Teilnahme
Bitte beachten Sie, dass es Ihnen freigestellt ist, an diesem Interview teilzunehmen. Sie können Ihre Teilnahme jederzeit zurückziehen. Sie können jederzeit Fragen zur Durchführung der Aufgabe stellen. Sie können alle Fragen ablehnen, die Sie nicht beantworten möchten.
Es steht Ihnen frei Ihre Einverständniserklärung innerhalb von 48 Stunden zurückzuziehen.

Fragen oder Anmerkungen
Prof. Dr. Hilda Tellioğlu ist die Supervisorin für dieser Masterarbeit. Wenn Sie Fragen, Bedenken oder Beschwerden bezüglich des Interviews oder der Art und Weise der Durchführung haben, wenden Sie sich bitte per E-Mail an Prof. Dr. Tellioğlu hilda.tellioglu@tuwien.ac.at oder Kristina Schiechl e0726448@student.tuwien.ac.at.

Seite 1

(a) Page 1

Ich habe das beiliegende Informationsblatt zu diesem Interview gelesen und verstanden und stimme der Teilnahme zu.	Ja ☐	Nein ☐
Ich bin damit einverstanden, dass Notizen während des Interviews gemacht werden.	Ja ☐	Nein ☐
Ich bin damit einverstanden, dass Audioaufnahmen gemacht und transkribiert werden.	Ja ☐	Nein ☐
Ich bin damit einverstanden, dass das Audiomaterial sowie das Transkript im Rahmen der Masterarbeit verwendet werden.	Ja ☐	Nein ☐
Ich möchte, dass meine Daten anonymisiert werden.	Ja ☐	Nein ☐

Name (in Blockbuchstaben):

_____

_____ _____
Datum Unterschrift

_____
Unterschrift der Interviewerin

Seite 2

(b) Page 2

Figure A.2: Consent form for expert interviews

APPENDIX B

Online Survey

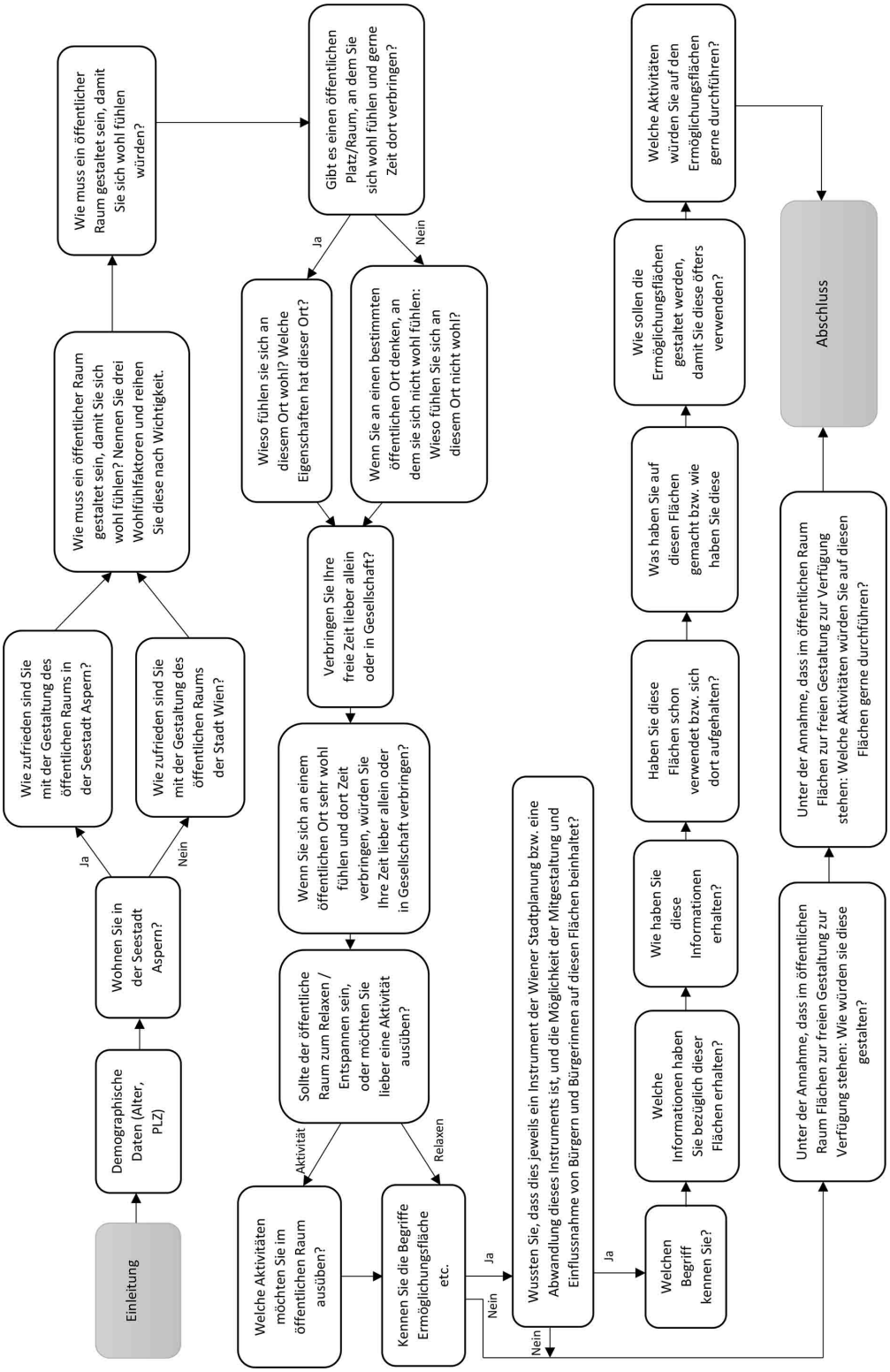


Figure B.1: Order of questions of the online survey. Original version.

APPENDIX C

Prototyping

C.1 The Initial Features and Functionality

- Search
- Menu
- *Ermöglichungsflächen* (favorites)
- Scan QR Code
- Locating
- Survey (questions on the design of the areas)
- Info about areas
- "Experience space" - *Ermöglichungsfläche*
  - Different scenarios (see Pokemon go)
  - 360 degree view
- Filter
  - *Ermöglichungsfläche*
  - *Möglichkeitszone*
- Events (menu)
- Log in or create account
- Notifications

- Profile
  - Preference about what user is informed about
  - Select areas by default and the filter is applied automatically
  - username
  - emails for information and registration.
- Comments / Likes / Disliked *Ermöglichungsfläche*
- Rate the app (what do residents want)
- Users can leave comments and other users can rate them
- Add an idea

C.2 Attribution of Authors for Icons and Photos

C.2.1 Photos - Unsplash

(a) Photo by KAL VISUALS on Unsplash https://unsplash.com/photos/b1Hg7QI-zcc

(b) Photo by Evan Dvorkin on Unsplash https://unsplash.com/photos/FLhnC9S_UE8

Figure C.1: Author Attribution Unsplash Photos

C.2.2 Icons - Flauticon

Icon Name	Icon(s) made by	Link
graphic.png, lounger.png, garden.png, park.png, tree.png, chair.png, bbq.png, sketch.png, review.png, scenario.png, gmail.png, friend.png, 360.png	Author “Freepik”	Author’s Flaticon page
bench.png	Author “those-icon”	Author’s Flaticon page
chill.png, route.png	Author “Smashicons”	Author’s Flaticon page
picnic.png	Author “Good-ware”	Author’s Flaticon page
yard.png	Author “Eucalyp”	Author’s Flaticon page
chess.png, playground.png	Author “photo3idea_studio”	Author’s Flaticon page
chair.png	Author “ultimatearm”	Author’s Flaticon page
bus.png, bell.png	Author “Pixel perfect”	Author’s Flaticon page

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Glossary

Dialog Plus *Dialog Plus* deals with technology and participation and the connection between them. Their team comes from different areas and can therefore offer a very broad expertise. 26, 30

Grätzl Grätzl (Englisch borough) are parts of residential districts in Vienna. 26

wien.welt.offen *wien.welt.offen* is a forum of the city of Vienna that creates space for objective and fact-based discussion of the topics of integration and diversity. 26

CyberParks CyberParks main task is to create a research platform for investigating the relationship between ICTs and the design of public spaces. Its aim is to improve the use of ICTs in public spaces and to make them more appealing. Participants with different professional experiences and backgrounds have collaborated to gather information on this topic and publish a book in 2019. 48

Governance In its STEP, Vienna strives for "good governance", which means establishing goal-oriented, partnership-based and transparent cooperation between all stakeholders that works to improve quality of life and sustainability. With the help of "good governance", the City of Vienna aims to define the basic attitude and the objectives to be pursued. 11

Handbook for Gender Mainstreaming in Urban Planning and Urban Development The handbook formulates goals and quality characteristics for the implementation of gender-sensitive planning and contains a collection of transferable methods and instruments for different planning levels such as master plan, zoning and development plan up to individual projects. It is intended as a practical working aid and as a comprehensive reference work in the everyday life of planning administration and the commissioned planners. 11

LQC Lighter, Quicker, Cheaper is a phrase to describe the simple, short-term, and low-cost solutions/projects that are having an impacts on the shaping of neighborhoods and cities. 43

place A place is created by the phenomena of direct experience. All experiences made there make up a place. Places are the origin of identity for people around the world. Experiencing, creating and maintaining each place is therefore essential. 39

space A space can be described as a location and is an abstract concept. If we get to know the space better and give it value, then it becomes a place. Thus, a space is a location that has not yet been given value. 39

third place Urban public places are called third places. The first place is the private home and the second is the workplace. 12, 45, 50, 113, 151

Urban Development Plan Urban planning is a process where the local government defines interventions, regulations, collective choices, organizational design, market corrections, citizen participation and public sector actions. An Urban Development Plan is a tool used to enable forward-looking urban planning and development. This plan broadly defines how the city will develop in the near future. 9

urban development projects Urban development projects are understood as the development of district-related projects that begin with an idea and end with the adoption of a new zoning or development plan. These can include individual construction projects, the development of a new district, improvement of regionally significant streets, and other projects that require a change in the zoning and development plan. 26

URM User Research Methods (URM) are methods that are used to learn more about the users of technology. These include a variety of methods to collect data and gain insight into the context of technology use and to collect quantitative as well as qualitative data. 4

Acronyms

AIT Austrian Institute of Technology. 20, 33, 70

BSA Boston Society of Architects. 38

CI Corporate Identity. 80, 81, 85, 132

COST Cooperation in Science and Technology. 48

GB* Gebietsbetreuungen Stadterneuerung. 30

hi-fi high-fidelity. 62, 65, 113, 118, 126–130, 133–135, 170

ICTs Information and Communication Technologies. 49, 50

KÖR Kunst im öffentlichen Raum Wien. 152

low-fi low fidelity. 62, 65, 113, 118–123, 125–127, 129–131, 170

LQC Lighter, Quicker, Cheaper (LQC). *Glossary:* LQC. 43

PPS Project for Public Spaces. 37–39, 41–45, 155, 156, 160

QUT Queensland University of Technology. 48

STEP *Stadtentwicklungsplan*. 9–11, 13

TA Thematic Analyis. 56

UCLG United Cities and Local Governments. 28, 29

UN United Nation. 28, 29

UNESCO United Nations Educational, Scientific and Cultural Organization. 12

URM User Research Methods. *Glossary:* URM. 4, 57, 58, 65–67, 89, 91, 105, 115

Bibliography

[1] inspirin - Technisches Büro für Landschaftsplanung. *Ermöglichungsflächen im öffentlichen Raum - Entwicklung und Begleitforschung von Ermöglichungsflächen im öffentlichen Raum*. Studie - Entwicklung des Planungsinstruments Ermöglichungsflächen. Stadt Wien MA 19 – Architektur und Stadtgestaltung Generelle Grundlagenplanung, Dec. 2018.

[2] Gebietsbetreuungen Stadterneuerung (GB*). *Garteln ums Eck*. URL: https://www.gbstern.at/themen-projekte/urbanes-garteln/garteln-ums-eck/ (visited on 05/11/2020).

[3] United Nation (UN). *Identifying social inclusion and exclusion*. 2016. URL: https://www.un.org/esa/socdev/rwss/2016/chapter1.pdf (visited on 05/07/2020).

[4] #kommraus and Stadt Wien. *#kommraus – Forum öffentlicher Raum*. URL: https://www.kommraus.wien/ (visited on 05/11/2020).

[5] Lokale Agenda 21. *Parklet - nehmen Sie Platz*. Aug. 1, 2016. URL: https://www.la21wien.at/blog-detail-la21/parklet-neuer-freiraum-vor-der-haustuer.html (visited on 05/11/2020).

[6] Ayat Ayman Abdel-Aziz, Hassan Abdel-Salam, and Zeyad El-Sayad. "The role of ICTs in creating the new social public place of the digital era". In: *Alexandria Engineering Journal* 55.1 (Mar. 2016), pp. 487–493. ISSN: 1110-0168. DOI: 10.1016/j.aej.2015.12.019. URL: http://www.sciencedirect.com/science/article/pii/S1110016815002124 (visited on 11/13/2019).

[7] Kerstin Arbter and MA 18 (Stadtentwicklung und Stadtplanung). *Praxisbuch Partizipation*. 127. Stadt Wien, 2012. ISBN: 978-3-902576-64-4. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008273.pdf (visited on 10/28/2019).

[8] Sherry R. Arnstein. "A Ladder Of Citizen Participation". In: *Journal of the American Institute of Planners* 35.4 (1969), pp. 216–224. DOI: 10.1080/01944366908977225. URL: https://doi.org/10.1080/01944366908977225.

[9] Georgios Artopoulos, Paschalis Arvanitidis, and Sari Suomalainen. “Using ICT in the Management of Public Open Space as a Commons”. In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 167–180. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_14. URL: https://doi.org/10.1007/978-3-030-13417-4_14.

[10] Seestadt Aspern. *“Gestaltungszone” wird zu “Stadtstrand”*. May 16, 2019. URL: https://www.aspern-seestadt.at/city-news/gestaltungszone_wird_zu_stadtstrand (visited on 01/27/2020).

[11] Seestadt Aspern. *Jetzt abstimmen: Neuer Name für die Gestaltungszonen*. Apr. 29, 2019. URL: https://www.aspern-seestadt.at/city-news/jetzt_abstimmen_neuer_name_fuer_die_gestaltungszonen_ (visited on 01/27/2020).

[12] Kurt Bader. “Alltägliche Lebensführung und Handlungsfähigkeit. Ein Beitrag zur Weiterentwicklung gemeinwesenorientierten Handelns”. In: *Stiftung Mitarbeit: Alltagsträume, Lebensführung im Gemeinwesen Beiträge zur Demokratieentwicklung von unten* 18 (2002), pp. 11–60.

[13] Howard S. Becker and Blanche Geer. “Participant Observation and Interviewing: A Comparison”. In: *Human Organization* 16.3 (1957), pp. 28–32. ISSN: 00187259, 19383525. URL: http://www.jstor.org/stable/44127708.

[14] Andrea Binder-Zehetner and Martin Heintel. “Öffentlicher Raum – Chancen und Risiken von Beteiligungsverfahren”. In: *In Bewegung: Beiträge zur Dynamik von Städten, Gesellschaften und Strukturen*. Ed. by Judith Fritz and Nino Tomaschek. Band 7. Waxmann, 2018, pp. 27–38. ISBN: 978-3-8309-3907-8 978-3-8309-8907-3.

[15] Alexander Bogner, Beate Littig, and Wolfgang Menz. “Introduction: Expert Interviews — An Introduction to a New Methodological Debate”. In: *Interviewing Experts*. Ed. by Alexander Bogner, Beate Littig, and Wolfgang Menz. London: Palgrave Macmillan UK, 2009, pp. 1–13. ISBN: 978-0-230-24427-6. DOI: 10.1057/9780230244276_1. URL: https://doi.org/10.1057/9780230244276_1.

[16] T. Boren and J. Ramey. “Thinking aloud: reconciling theory and practice”. In: *IEEE Transactions on Professional Communication* 43.3 (2000), pp. 261–278. DOI: 10.1109/47.867942. URL: https://ieeexplore.ieee.org/document/867942 (visited on 07/14/2020).

[17] Petra M Boynton and Trisha Greenhalgh. “Selecting, designing, and developing your questionnaire”. In: *BMJ* 328.7451 (2004), pp. 1312–1315. ISSN: 0959-8138. DOI: 10.1136/bmj.328.7451.1312. eprint: https://www.bmj.com/content/328/7451/1312.full.pdf. URL: https://www.bmj.com/content/328/7451/1312.

[18] Paul-Henry Chombart de Lauwe. “Aneignung, Eigentum, Enteignung. Sozialpsychologie der Raumaneignung und Prozesse gesellschaftlicher Veränderung”. In: *Arch+ Zeitschrift für Architekten, Sozialarbeiter und kommunalpolitische Gruppen* 34 (1977), pp. 02–06.

[19] United Cities and Local Governments (UCLG). *Social Inclusion and Participatory Democracy*. Feb. 2014. URL: https://www.uclg-cisdp.org/en/observatory/reports/social-inclusion-and-participatory-democracy-conceptual-discussion-local-action (visited on 05/07/2020).

[20] Stadt Wien - Smart City. *PlaceCity - Creating better cities together*. URL: https://smartcity.wien.gv.at/site/place-city/ (visited on 05/11/2020).

[21] CityMaking!Wien. *CityMaking!Wien - Pop up Parklets!* URL: https://citymaking.wien/de/parklets/ (visited on 05/11/2020).

[22] Victoria Clarke and Virginia Braun. *Successful Qualitative Research: A Practical Guide for Beginners*. Mar. 2013. ISBN: 9781847875815.

[23] Victoria Clarke and Virginia Braun. “Using thematic analysis in psychology”. In: *Qualitative Research in Psychology* 3 (Jan. 2006), pp. 77–101. DOI: 10.1191/1478088706qp063oa.

[24] Carlos Smaniotto Costa et al., eds. *CyberParks - The Interface Between People, Places and Technology: New Approaches and Perspectives*. Information Systems and Applications, incl. Internet/Web, and HCI, Lect.Notes ComputerState-of-the-Art Surveys. Springer International Publishing, 2019. ISBN: 978-3-030-13416-7. DOI: 10.1007/978-3-030-13417-4. URL: https://www.springer.com/gp/book/9783030134167 (visited on 11/14/2019).

[25] New Castle City Council. *Place Makers Toolkit 2012*. Oct. 2012. URL: https://www.newcastle.nsw.gov.au/Newcastle/media/Documents/Community/Place-Making-Toolkit.pdf (visited on 04/20/2020).

[26] Johannes Daae and Casper Boks. “A classification of user research methods for design for sustainable behaviour”. In: *Journal of Cleaner Production* 106 (2015), pp. 680–689. ISSN: 0959-6526. DOI: https://doi.org/10.1016/j.jclepro.2014.04.056. URL: http://www.sciencedirect.com/science/article/pii/S0959652614004120.

[27] AIGA - the professional association for design. *An Ethnography Primer*. URL: https://www.aiga.org/ethnography-primer (visited on 07/13/2020).

[28] Stadt Dietikon. *Dialog Stadtentwicklung*. URL: https://www.dietikon.ch/bauenumwelt/bauen/stadtentwicklung/11392 (visited on 07/13/2020).

[29] Studio Dietikon. *mein.studiodietikon.ch*. URL: https://www.studiodietikon.ch/mein-studiodietikon-ch/ (visited on 07/13/2020).

[30] Aleksandra Djukic, Thanos Vlastos, and Viera Joklova. “Liveable Open Public Space - From Flaneur to Cyborg”. In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 38–49. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_4. URL: https://doi.org/10.1007/978-3-030-13417-4_4.

[31] Owen Doody and Maria Noonan. “Preparing and conducting interviews to collect data”. In: *Nurse Researcher* 20 (May 2013), pp. 28–32. DOI: 10.7748/nr2013.05.20.5.28.e327.

[32] Duden. *Das Synonymwörterbuch - Ein Wörterbuch sinnverwandter Wörter*. 5. Mannheim: Duden, 2010. ISBN: 9783411040858.

[33] The College of Estate Management (CEM). *Sustaining cultural identity and a sense of place – new wine in old bottles or old wine in new bottles?* Mar. 2011. URL: https://www.newcastle.nsw.gov.au/Newcastle/media/Documents/Community/Place-Making-Toolkit.pdf (visited on 04/21/2020).

[34] FFG. *PlaceCity - Placemaking for Sustainable, Thriving Cities*. 2019. URL: https://projekte.ffg.at/projekt/3275711 (visited on 12/05/2019).

[35] *Figl/Lichtenegger: Neuvergabe am Donaukanal ohne Bezirke unverständlich*. URL: https://www.ots.at/presseaussendung/OTS_20181005_OTS0012/figllichtenegger-neuvergabe-am-donaukanal-ohne-bezirke-unverstaendlich (visited on 01/22/2020).

[36] Marcus Foth. “Towards a design methodology to support social networks of residents in inner-city apartment buildings”. PhD thesis. Queensland University of Technology, 2006. URL: https://eprints.qut.edu.au/16655/.

[37] Marcus Foth. *Urban Informatics venn diagram*. May 2020. URL: https://figshare.com/articles/figure/Urban_Informatics_venn_diagram/12269504/1.

[38] Marcus Foth, Jaz Hee-jeong Choi, and Christine Satchell. “Urban Informatics”. In: *Proceedings of the ACM 2011 Conference on Computer Supported Cooperative Work*. CSCW ’11. event-place: Hangzhou, China. New York, NY, USA: ACM, 2011, pp. 1–8. ISBN: 978-1-4503-0556-3. DOI: 10.1145/1958824.1958826. URL: http://doi.acm.org/10.1145/1958824.1958826 (visited on 10/29/2019).

[39] Marcus Foth and Markus Rittenbruch. “Building a Research Group: Urban Informatics 2006 to now”. In: *How to Be a Design Academic in an Interdisciplinary World*. Ed. by Alethea Blackler and Evonne Miller. CRC Press, 2020. URL: https://eprints.qut.edu.au/200279/.

[40] Judith Fritz and Nino Tomaschek, eds. *In Bewegung: Beiträge zur Dynamik von Städten, Gesellschaften und Strukturen*. University Society Industry Band 7. Münster New York: Waxmann, 2018. ISBN: 978-3-8309-3907-8 978-3-8309-8907-3.

[41] Institute for the Future (IFTF). *Science & Technology Perspectives: 2005–2055*. Report No. SR-967. May 2006. URL: https://www.iftf.org/uploads/media/TH_SR-967_S%26T_Perspectives.pdf (visited on 07/10/2020).

[42] Garagnani, Simone; James Arteaga and Luisa Bravo. "From Smart Cities to Human Smart Cities". In: *Parametricism Vs. Materialism: Evolution of Digital Technologies for Development [8th ASCAAD Conference Proceedings*. Nov. 2016, pp. 431–436. URL: http://papers.cumincad.org/cgi-bin/works/P=http:/Show?ascaad2016_044 (visited on 04/21/2020).

[43] Miriam García García. "Written at the place. The intangible values of the landscape". In: *ZARCH. Journal of interdisciplinary studies in Architecture and Urbanism* 1 (Jan. 2013).

[44] J. Gehl. *Life Between Buildings: Using Public Space*. Island Press, 2011. ISBN: 9781610910231. URL: https://books.google.at/books?id=X707aiCq6T8C.

[45] Rebekah White (New Zealand Geographic). *A third place*. URL: https://www.nzgeo.com/stories/a-third-place/ (visited on 07/08/2020).

[46] Human Geography. *Space vs. Place*. URL: http://geography.ruhosting.nl/geography/index.php?title=Space_vs._place (visited on 02/26/2020).

[47] Wien Gestalten and Dialog Plus. *#kommraus – Forum öffentlicher Raum*. URL: https://www.wiengestalten.at/kommraus-forum-oeffentlicher-raum/ (visited on 05/11/2020).

[48] Wien Gestalten and Dialog Plus. *Garteln ums Eck*. URL: https://www.wiengestalten.at/garteln-ums-eck/ (visited on 05/11/2020).

[49] Wien Gestalten and Dialog Plus. *Wien gestalten - Über das Projekt*. URL: https://www.wiengestalten.at/ueber-das-projekt/ (visited on 05/11/2020).

[50] Wien Gestalten and Dialog Plus. *Wien wird WOW*. URL: https://www.wiengestalten.at/wien-wird-wow/ (visited on 05/11/2020).

[51] Grätzloase. *Aktionen 2019*. URL: https://www.graetzloase.at/aktionen-2019.html (visited on 05/11/2020).

[52] Sarah Gibbons - Nielsen Norman Group. *Design Thinking 101*. July 31, 2016. URL: https://www.nngroup.com/articles/design-thinking/ (visited on 07/14/2020).

[53] The Guardian. *Anti-homeless spikes: 'Sleeping rough opened my eyes to the city's barbed cruelty'*. Feb. 2015. URL: https://www.theguardian.com/society/2015/feb/18/defensive-architecture-keeps-poverty-undeen-and-makes-us-more-hostile (visited on 02/25/2020).

[54] Greg Guest, Emily Namey, and Marilyn Mitchell. *Collecting Qualitative Data: A Field Manual for Applied Research*. Jan. 2013. ISBN: 9781412986847.

[55] Stadt Hamburg. *HORIZON 2020 SMARTICIPATE*. URL: https://www.hamburg.de/international/horizon-2020/9878634/smarticipate/ (visited on 05/12/2020).

[56] Lars Holmquist. "Prototyping: generating ideas or cargo cult designs?" In: *Interactions* 12 (Jan. 2005), pp. 48–54.

[57] L.D. Hopkins. *Urban development: the logic of making plans*. Urban Development: The Logic of Making Plans Bd. 166. Island Press, 2001. ISBN: 9781559638531. URL: http://www.cmecc.com/uploads/%E8%AF%BE%E6%9C%AC%E5%92%8C%E8%AE%BA%E6%96%87/Urban.Planning_Design/[133][%E8%A7%84%E5%88%92%E8%AE%BE%E8%AE%A1]Hopkins,.L.(2001).Urban.development_the.logic.of.making.plans.pdf (visited on 12/04/2019).

[58] Kirralie Houghton. "Augmenting public urban spaces : the impact of the digital future on the design of public urban spaces". In: *Utopia 2010 PIA Queensland State Planning Conference*. Dec. 2010, pp. 19–23. URL: https://eprints.qut.edu.au/39503/.

[59] Ulrike Hüllemann, Christian Reutlinger, and Ulrich Deinet. "Aneignung". In: *Handbuch Sozialraum*. Ed. by Fabian Kessl and Christian Reutlinger. Wiesbaden: Springer Fachmedien Wiesbaden, 2017, pp. 1–18. ISBN: 978-3-531-19988-7. DOI: 10.1007/978-3-531-19988-7_24-1. URL: https://doi.org/10.1007/978-3-531-19988-7_24-1.

[60] Frauenhofer IGD. *smarticipate – smart open data services and impact assessment for open governance*. URL: https://www.igd.fraunhofer.de/projekte/smarticipate-smart-open-data-services-and-impact-assessment-open-governance (visited on 05/12/2020).

[61] betreut durch die ÖGUT. Initiative des BMK. *Partizipation & nachhaltige Entwicklung in Europa - Stufen der Beteiligung*. URL: https://www.partizipation.at/anwendung.html (visited on 05/05/2020).

[62] betreut durch die ÖGUT. Initiative des BMK. *Partizipation & nachhaltige Entwicklung in Europa - Stufen der Beteiligung*. URL: https://www.partizipation.at/rechtlicherrahmen.html#c918 (visited on 05/05/2020).

[63] Inspirin. *Team: DI Sabine Gstöttner, Landschaftsplanung*. URL: http://www.inspirin.at/gstoettner.htm.

[64] Institute for Culture and Society, Western Sydney University and Sarah Barns. "FCJ-214 Visions of Urban Informatics: From Proximate Futures to Data-Driven Urbanism". In: *The Fibreculture Journal* 29 (July 2017). ISSN: 14491443. DOI: 10.15307/fcj.29.204.2017. URL: http://twentynine.fibreculturejournal.org/fcj-214-visions-of-ormatics-from-proximate-futures-to-data-driven-urbanism/ (visited on 11/13/2019).

[65] Elisabeth Irschik. *Handbuch Gender Mainstreaming in der Stadtplanung und Stadtentwicklung: STEP 2025 Stadtentwicklungsplan*. Werkstattberichte / Stadtentwicklung 130. Wien: Stadtentwicklung Wien, MA. 18 - Stadtentwicklung und Stadtplanung, 2013. ISBN: 978-3-902576-67-5. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008290.pdf (visited on 11/26/2019).

[66] Jane Jacobs. *The Death and Life of Great American Cities*. Vintage Books - A Division of Random House, 1961. ISBN: 9780679644330. URL: https://www.buurtwijs.nl/sites/default/files/buurtwijs/bestanden/jane_jacobs_the_death_and_life_of_great_american.pdf (visited on 02/27/2020).

[67] Rahel Jaeggi. *Aneignung Braucht Fremdheit*. July 2002. URL: https://www.textezurkunst.de/46/aneignung-braucht-fremdheit/ (visited on 07/09/2020).

[68] R. Johnson and Larry Christensen. *Educational Research Quantitative, Qualitative, and Mixed Approaches Fifth Edition*. Jan. 2014.

[69] Strong Towns - Gracen Johnson. *Places Where I Don't Want to Sit*. May 2016. URL: https://www.strongtowns.org/journal/2016/5/23/places-where-i-dont-want-to-sit?utm_medium=website&utm_source=archdaily.com (visited on 02/25/2020).

[70] Do Kim. "A Design Methodology Using Prototyping Based on the Digital-Physical Models in the Architectural Design Process". In: *Sustainability* 11 (Aug. 2019), p. 4416. DOI: 10.3390/su11164416.

[71] J. Kjeldskov and J. Paay. "Public Pervasive Computing: Making the Invisible Visible". In: *Computer* 39.9 (2006), pp. 60–65. URL: https://ieeexplore.ieee.org/document/1703314 (visited on 07/10/2020).

[72] PlanSinn Planung und Kommunikation GmbH and Magistratsabteilung 19 - Architektur und Stadtgestaltung Stadt Wien. *Fachkonzept Öffentlicher Raum*. 175. Werkstattberichte der Stadtentwicklung Wien, 2018. ISBN: 978-3-903003-41-5. URL: https://www.wien.gv.at/stadtentwicklung/studien/b008522.html (visited on 10/13/2019).

[73] Tanja Simonič Koročak et al. *Report of Participatory Tools, Methods and Techniques*. Dec. 31, 2018. URL: https://www.alpine-space.eu/projects/smartvillages/partners-description/smartvillages_181231_co-creation_-d-t3.-1.1.pdf (visited on 05/08/2020).

[74] Claudius Lieven. "DIPAS-Towards an integrated GIS-based system for civic participation". In: *Procedia Computer Science* 112 (2017). Knowledge-Based and Intelligent Information and Engineering Systems: Proceedings of the 21st International Conference, KES-20176-8 September 2017, Marseille, France, pp. 2473–2485. ISSN: 1877-0509. DOI: https://doi.org/10.1016/j.procs.2017.08.182. URL: http://www.sciencedirect.com/science/article/pii/S1877050917315399.

[75] Wiener Linien. *WienMobil*. URL: https://play.google.com/store/apps/details?id=at.wienerlinien.wienmobillab&hl=de_AT (visited on 06/30/2020).

[76] Nenad Lipovac. "Space and Place (Prostor i mjesto)". In: *Prostor: a scholarly journal of architecture and urban planning* 5.1 (Jan. 1997), pp. 1–34.

[77] Aaron R. Lyon and Kelly Koerner. "User-Centered Design for Psychosocial Intervention Development and Implementation". In: *Clinical Psychology: Science and Practice* 23.2 (2016), pp. 180–200. DOI: 10.1111/cpsp.12154. eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/cpsp.12154. URL: https://onlinelibrary.wiley.com/doi/abs/10.1111/cpsp.12154.

[78] P. J. Mayhew and P. A. Dearnley. "An Alternative Prototyping Classification". In: *The Computer Journal* 30.6 (Dec. 1987), pp. 481–484. ISSN: 0010-4620. DOI: 10.1093/comjnl/30.6.481. eprint: https://academic.oup.com/comjnl/article-pdf/30/6/481/935283/30-6-481.pdf. URL: https://doi.org/10.1093/comjnl/30.6.481.

[79] Marluci Menezes et al. "People - Space - Technology: An Ethnographic Approach". In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 76–86. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_7. URL: https://doi.org/10.1007/978-3-030-13417-4_7.

[80] Luca Mora, Mark Deakin, and Alasdair Reid. "Strategic principles for smart city development: A multiple case study analysis of European best practices". In: *Technological Forecasting and Social Change*. Understanding Smart Cities: Innovation ecosystems, technological advancements, and societal challenges. 142 (May 2019), pp. 70–97. ISSN: 0040-1625. DOI: 10.1016/j.techfore.2018.07.035. URL: http://www.sciencedirect.com/science/article/pii/S0040162517318590 (visited on 10/29/2019).

[81] Luca Mora et al. "How to Overcome the Dichotomous Nature of Smart City Research: Proposed Methodology and Results of a Pilot Study". In: *Journal of Urban Technology* 26.2 (Apr. 2019), pp. 89–128. ISSN: 1063-0732, 1466-1853. DOI: 10.1080/10630732.2018.1525265. URL: https://www.tandfonline.com/doi/full/10.1080/10630732.2018.1525265 (visited on 10/29/2019).

[82] BSA Placemaking Network. *Placemaking Manifesto*. Oct. 23, 2017. URL: https://www.architects.org/uploads/Placemaking-Manifesto-1017.pdf (visited on 02/26/2020).

[83] JAKOB NIELSEN. "Chapter 6 - Usability Testing". In: *Usability Engineering*. Ed. by JAKOB NIELSEN. San Diego: Morgan Kaufmann, 1993, pp. 165–206. ISBN: 978-0-12-518406-9. DOI: https://doi.org/10.1016/B978-0-08-052029-2.50009-7. URL: http://www.sciencedirect.com/science/article/pii/B9780080520292500097.

[84] Jakob Nielsen. *Thinking Aloud: The No. 1 Usability Tool*. Jan. 15, 2012. URL: https://www.nngroup.com/articles/thinking-aloud-the-1-usability-tool/ (visited on 07/14/2020).

[85] Meike Nieß. "Partizipation". In: *Partizipation aus Subjektperspektive: Zur Bedeutung von Interessenvertretung für Menschen mit Lernschwierigkeiten*. Wiesbaden: Springer Fachmedien Wiesbaden, 2016, pp. 67–122. ISBN: 978-3-658-14014-4. DOI: 10.1007/978-3-658-14014-4_3. URL: https://doi.org/10.1007/978-3-658-14014-4_3.

[86] *Petition gegen Gastrogroßprojekte am Donaukanal*. URL: https://www.derstandard.at/story/2000081880520/petition-gegen-gastro-grossprojekte-am-donaukanal (visited on 01/22/2020).

[87] Claudia Pirchl. "Utopie und Realität des Selbermachens - Potenziale von Eigeninitiativ-Projekten im urbanen Raum von Wien". In: *Eingereicht an der Technischen Universität Wien Fakultät für Architektur und Raumplanung* (Mar. 2015), p. 142. URL: http://repositum.tuwien.ac.at/obvutwhs/content/titleinfo/1642665?lang=de (visited on 10/15/2019).

[88] Community Planning and Zoning. *Placemaking: A Tool for Rural and Urban Communities*. URL: https://community-planning.extension.org/placemaking:-a-tool-for-rural-and-urban-communities/#.VPr5PeF3JyE (visited on 11/13/2019).

[89] Dialog Plus, Lisa Vlasak MSc, and Mag. Peter Kühnberger. *Partizipation und Teilhabemöglichkeiten in Wien - Beteiligungsangeboten für StadtbürgerInnen der Stadt Wien*. Studie für die Fachenquete Vielfältige Beteiligung: Wiener StadtbürgerInnenschaft. Feb. 2019. URL: https://dialogplus.at/wp-content/uploads/2019/06/20190704_Partizipationsangebote_Stadt_Wien.pdf (visited on 10/14/2019).

[90] Katrin Prager. *Is co-creation more than participation?* July 28, 2016. URL: https://i2insights.org/2016/07/28/co-creation-or-participation/ (visited on 05/10/2020).

[91] AIGA - the Professional Association for Design. *Survey Method*. URL: https://research-methodology.net/research-methods/survey-method/ (visited on 07/14/2020).

[92] Baltic Urban Lab project. *Stakeholder involvement app AvaLinn utilised in Tallinn*. URL: http://www.balticurbanlab.eu/goodpractices/stakeholder-involvement-app-avalinn-utilised-tallinn (visited on 07/13/2020).

[93] Project for Public Spaces (PPS). *Eleven Principles for Creating Great Community Places*. URL: https://www.pps.org/article/11steps (visited on 02/26/2020).

[94] Project for Public Spaces (PPS). *Get Into Your Comfort Zone: Five Indicators of Comfort in Public Spaces*. Mar. 2, 2018. URL: https://www.pps.org/article/get-into-your-comfort-zone (visited on 04/20/2020).

[95] Project for Public Spaces (PPS). *Placemaking and Place-Led Development. What if We Built Our Communities Around Places?* URL: https://www.pps.org/article/placemaking-and-place-led-development-a-new-paradigm-for-cities-of-the-future (visited on 02/25/2020).

[96] Project for Public Spaces (PPS). *Placemaking Booklet. What if we built our cities around places?* 2018. URL: https://uploads-ssl.webflow.com/5810e16fbe876cec6bcbd86e/5b71f88ec6f4726edfe3857d_2018%20placemaking%20booklet.pdf (visited on 02/27/2020).

[97] Project for Public Spaces (PPS). *Ray Oldenburg*. Dec. 31, 2008. URL: https://www.pps.org/article/roldenburg (visited on 07/08/2020).

[98] Project for Public Spaces (PPS). *Sitwalls, Ledges & Steps*. Dec. 2008. URL: https://www.pps.org/article/sitwalls (visited on 02/25/2020).

[99] Project for Public Spaces (PPS). *The Lighter, Quicker, Cheaper Transformation of Public Spaces*. URL: https://www.pps.org/article/lighter-quicker-cheaper (visited on 02/27/2020).

[100] Project for Public Spaces (PPS). *The Place Game: How We Make the Community the Expert*. June 14, 2016. URL: https://www.pps.org/article/place-game-community (visited on 03/02/2020).

[101] Project for Public Spaces (PPS). *The Placemaking Process*. Dec. 2017. URL: https://www.pps.org/article/5-steps-to-making-places (visited on 02/27/2020).

[102] Project for Public Spaces (PPS). *The Power of 10+*. URL: https://www.pps.org/article/the-power-of-10 (visited on 03/02/2020).

[103] Project for Public Spaces (PPS). *What is Placemaking?* 2007. URL: https://www.pps.org/article/what-is-placemaking (visited on 02/25/2020).

[104] Project for Public Spaces (PPS). *What Makes a Successful Place?* URL: https://www.pps.org/article/grplacefeat (visited on 12/05/2019).

[105] Project for Public Spaces. *How to Turn a Place Around: A Handbook for Creating Successful Public Spaces*. Project for Public Spaces, 2000. ISBN: 9780970632401. URL: https://www.pps.org/product/how-to-turn-a-place-around.

[106] Project for Public Spaces and Illinois Metropolitan Planning Council Chicago. *A Guide to Neighborhood Placemaking in Chicago*. 2008. URL: http://www.placemakingchicago.com/cmsfiles/placemaking_guide.pdf (visited on 02/26/2020).

[107] Olga Pulyaevskaya and Evgeniya Pulyaevskaya. "Modern assessment of social psychological sustainability and urban environment quality". In: *IOP Conference Series: Materials Science and Engineering* 667 (Nov. 2019), p. 11. ISSN: 1757-899X. DOI: 10.1088/1757-899X/667/1/012085. URL: https://doi.org/10.1088%2F1757-899x%2F667%2F1%2F012085 (visited on 12/04/2019).

[108] Stadler Reinhold. “ICTs as a Tool to Increase the Attractiveness of Public Spaces”. In: *Mokslas - Lietuvos ateitis* 5 (May 2013), pp. 216–228. DOI: 10.3846/mla.2013.39.

[109] Julia Rode. “Aneignung und Integration im Freiraum : am Beispiel von drei Freiräumen in Greifenstein”. Masterarbeit. Wien, Univ. für Bodenkultur, 2013. URL: https://epub.boku.ac.at/obvbokhs/content/titleinfo/1127341 (visited on 07/08/2020).

[110] Tatiana Ruchinskaya, Konstantinos Ioannidis, and Kinga Kimic. “Revealing the Potential of Public Places: Adding a New Digital Layer to the Existing Thematic Gardens in Thessaloniki Waterfront”. In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 181–195. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_15. URL: https://doi.org/10.1007/978-3-030-13417-4_15.

[111] Kristina Rydälv Kåreby. “The planet, my city and I : How to design information in public places so that people understand how their individual choices can help creating a sustainable society.” Student thesis. Linnaeus University, Faculty of Technology, Department of Informatics., 2019. URL: http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-86194 (visited on 07/08/2020).

[112] Thomas Schürmann. *Placemaking als Konzept ökonomisch effizienter Standortaufwertung. Eine Analyse englischsprachiger Literatur*. Dortmund: Institut für Landes- und Stadtentwicklungsforschung und Bauwesen des Landes Nordrhein-Westfalen (ILS NRW), Dec. 2006. ISBN: 3-86934-011-1. URL: https://d-nb.info/995945667/34.

[113] Jan Seeburger, Marcus Foth, and Dian Tjondronegoro. “Designing and Evaluating Mobile Multimedia User Experiences in Public Urban Places: Making Sense of the Field”. In: *Mobile Multimedia - User and Technology Perspectives*. Ed. by Dian Tjondronegoro. InTech, Jan. 2012. ISBN: 978-953-307-908-0. DOI: 10.5772/39050. URL: http://www.intechopen.com/books/mobile-multimedia-user-and-technology-perspectives/designing-and-evaluating-mobile-multimedia-user-experiences-in-public-urban-places-making-sense-of-t (visited on 10/13/2019).

[114] Jesper Simonsen and Finn Kensing. “Using Ethnography in Contextual Design”. In: *Communications of the ACM* 40 (July 1997), pp. 82–88. DOI: 10.1145/256175.256190.

[115] Carlos Smaniotto Costa and Ina Šuklje Erjavec. “The Rationale of CyberParks and the Potential of Mediated Public Open Spaces”. In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 3–13. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_1. URL: https://doi.org/10.1007/978-3-030-13417-4_1.

[116] Smarticipate. *DIPAS Digitales Partizipationssystem*. URL: https://www.hamburg.de/dipas/ (visited on 05/12/2020).

[117] Smarticipate. *Prototype Smarticipate Platform*. URL: https://dev.smarticipate.eu/ (visited on 05/12/2020).

[118] Smarticipate. *Smarticipate*. URL: https://www.smarticipate.eu/ (visited on 05/12/2020).

[119] Smarticipate. *Smarticipate - How to create a new app*. URL: https://www.smarticipate.eu/wp-content/uploads/20161003_Hamburg_Urban-Story_Strassenbaumkataster_GERMAN.pdf (visited on 05/12/2020).

[120] Smarticipate. *Smarticipate - How to create a new app*. Oct. 2018. URL: https://www.smarticipate.eu/wp-content/uploads/20181022_SMARTICIPATE_App-Making-Manual_masterfile_Upload_web.pdf (visited on 05/12/2020).

[121] Space and place - kulturelle Raumgestaltung. *Placemaking Network Night*. 2019. URL: http://spaceandplace.at/placemaking-nightwalk-floridsdorf/ (visited on 12/05/2019).

[122] Space and Place. *Brigitte Vettori*. URL: http://spaceandplace.at/uber-uns/team/brigitte-vettori/ (visited on 05/19/2020).

[123] Space and Place. *Über uns*. URL: http://spaceandplace.at/about/de (visited on 05/11/2020).

[124] Space and Place. *Wien lebt*. URL: http://spaceandplace.at/wl/ (visited on 05/11/2020).

[125] Space and Place. *Wohnstraße*. URL: http://spaceandplace.at/wohnstrassenleben (visited on 05/11/2020).

[126] Space and Place. *Wohnstraße Karte*. URL: http://spaceandplace.at/wohnstrassen-karte/ (visited on 05/11/2020).

[127] Space and Place. *Wohnstraßen Quiz*. URL: http://spaceandplace.at/wohnstrassen-quiz/ (visited on 05/11/2020).

[128] Magistrat der Stadt Wien. *Smart City Wien Rahmenstrategie 2019-2050*. Wien: Stadt Wien, June 2019. URL: https://smartcity.wien.gv.at/site/files/2019/10/Smart-City-Wien-Rahmenstrategie-2019-2050.pdf (visited on 10/28/2019).

[129] Magistrat der Stadt Wien and MA 21 (Stadtteilplanung und Flächennutzung). *Masterplan für eine Partizipative Stadtentwicklung*. Wien: Stadt Wien, 2017. ISBN: 978-3-903003-35-4. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008505.pdf (visited on 10/28/2019).

[130] Magistrat der Stadt Wien and MA19 – Architektur und Stadtgestaltung. *Baukulturelle Leitsätze für Wien*. 2014. URL: https://www.wien.gv.at/stadtentwicklung/architektur/baukultur/ (visited on 11/26/2019).

[131] MA 18 (Stadtentwicklung und Stadtplanung) and Magistrat der Stadt Wien. *Smart City Wien Rahmenstrategie*. Wien: Stadt Wien, 2014. ISBN: 978-3-902576-88-0. URL: https://smartcity.wien.gv.at/site/wp-content/blogs.dir/3/files/2014/08/Langversion_SmartCityWienRahmenstrategie_deutsch_doppelseitig.pdf (visited on 10/28/2019).

[132] MA18 (Stadtentwicklung und Stadtplanung) and wien 3420 aspern development AG. *aspern die Seestadt Wiens - Fortschreibung Masterplan*. Wien: Stadtentwicklung Wien 2018, 2018. ISBN: 978-3-903003-42-2. URL: https://issuu.com/asperndieseestadtwiens/docs/aspern_fortschreibung_masterplan/4 (visited on 10/28/2019).

[133] Magistratsabteilung 18 (Stadtentwicklung und Stadtplanung). *Fachkonzept Mobilität*. Werkstattberichte der Stadtentwicklung Wien. Nr. 145. Wien, 2015. ISBN: 978-3-902576-97-2. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008390b.pdf (visited on 11/25/2019).

[134] MA23 - (Wirtschaft Arbeit Statistik). *Stadttechnologien - Übersicht*. URL: https://www.wien.gv.at/forschung/staerkefelder/stadttechn.html (visited on 11/26/2019).

[135] MA 28 – Straßenverwaltung und Straßenbau. *belebte freiräume - Öffentlicher Parkraum und alternative Nutzung*. URL: https://www.graetzloase.at/files/files/Folder%20MA28_belebte%20Freiraeume_oeffentlicher%20Parkraum.pdf (visited on 01/30/2020).

[136] Streetlife. *Ich mach' ein Parklet!* URL: https://www.streetlife.wien/ich-mach-ein-parklet/ (visited on 05/11/2020).

[137] Janienke Sturm et al. "Playful interactions stimulating physical activity in public spaces". In: *Proceedings of the Conference on Human Factors in Computing Systems Workshops* (Jan. 2013), pp. 1–6.

[138] Ina Šuklje Erjavec and Tatiana Ruchinskaya. "A Spotlight of Co-creation and Inclusiveness of Public Open Spaces". In: *CyberParks – The Interface Between People, Places and Technology: New Approaches and Perspectives*. Ed. by Carlos Smaniotto Costa et al. Cham: Springer International Publishing, 2019, pp. 209–223. ISBN: 978-3-030-13417-4. DOI: 10.1007/978-3-030-13417-4_17. URL: https://doi.org/10.1007/978-3-030-13417-4_17.

[139] AIT Austrian Institute of Technology GmbH. *smarticipate*. URL: https://www.ait.ac.at/themen/digital-resilient-cities/projects/smarticipate/ (visited on 05/12/2020).

[140] Smarter Together. *Partizipative Budgets im Fokus. Smarticipate – gemeinsames Gestalten einfacher gemacht*. URL: https://www.smartertogether.at/smarticipate/ (visited on 05/12/2020).

[141] Yi-fu Tuan. "Space and Place: The Perspective of Experience." In: (1978). DOI: 10.2307/2064418.

[142] UNESCO. *Inclusion Through Access to Public Space*. URL: http://www.unesco.org/new/en/social-and-human-sciences/themes/urban-development/migrants-inclusion-in-cities/good-practices/inclusion-through-access-to-public-space/ (visited on 07/07/2020).

[143] URBIS. *Shaping Spaces for People: Measuring the value of place. Diverse, Place-led developments thrive*. Oct. 30, 2019. URL: https://urbis.com.au/insights-news/shaping-spaces-for-people/ (visited on 03/02/2020).

[144] L. van Waes. "Thinking aloud as a method for testing the usability of Websites: the influence of task variation on the evaluation of hypertext". In: *IEEE Transactions on Professional Communication* 43.3 (2000), pp. 279–291. DOI: 10.1109/47.867944. URL: https://ieeexplore.ieee.org/abstract/document/867944 (visited on 07/14/2020).

[145] City of Vienna. *Vienna Charter. Shaping the Future Together*. URL: https://www.wien.gv.at/english/living-working/vienna-charter.html (visited on 12/06/2019).

[146] City of Vienna and MA 17 (Integration und Diversität). *WIENER CHARTA - The Core Document*. Tech. rep., p. 16. URL: https://www.wien.gv.at/english/living-working/vienna-charter.html (visited on 12/06/2019).

[147] L. Waidelich et al. "Design Thinking Process Model Review". In: *2018 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*. 2018, pp. 1–9. DOI: 10.1109/ICE.2018.8436281. URL: https://ieeexplore.ieee.org/document/8436281.

[148] Barry Wellman. "Physical Place and Cyberplace: The Rise of Personalized Networking". In: *International Journal of Urban and Regional Research* 25 (Feb. 2001), pp. 227–252. DOI: 10.1111/1468-2427.00309. URL: https://onlinelibrary.wiley.com/doi/abs/10.1111/1468-2427.00309 (visited on 10/31/2019).

[149] W.H. Whyte. *The social life of small urban spaces*. Conservation Foundation, 1980. ISBN: 9780891640578.

[150] Garteln in Wien. *Garteln ums Eck*. URL: https://www.garteln-in-wien.at/garteln-ums-eck/ (visited on 05/11/2020).

[151] Stadt Wien. *Apps der Stadt Wien*. URL: https://www.wien.gv.at/politik-verwaltung/apps.html (visited on 06/30/2020).

[152] Stadt Wien. *Ausstellung Wien wird WOW*. URL: https://www.wien.gv.at/stadtentwicklung/veranstaltungen/ausstellungen/wien-wird-wow.html (visited on 05/11/2020).

[153] Stadt Wien. *Detailkonzepte - STEP 2025 - Elektromobilitäts-Strategie*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/detailkonzepte/e-mobilitaet/index.html (visited on 12/03/2019).

[154] Stadt Wien. *Fachkonzept Energieraumplanung - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/energieraumplanung/index.html (visited on 12/03/2019).

[155] Stadt Wien. *Fachkonzept Grün- und Freiraum - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/gruen-freiraum/index.html (visited on 12/03/2019).

[156] Stadt Wien. *Fachkonzept Hochhäuser - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/hochhaeuser/index.html (visited on 12/03/2019).

[157] Stadt Wien. *Fachkonzept Mobilität - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/mobilitaet/index.html (visited on 12/03/2019).

[158] Stadt Wien. *Fachkonzept Öffentlicher Raum - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/oeffentlicher-raum/index.html (visited on 12/03/2019).

[159] Stadt Wien. *Fachkonzept Produktive Stadt - Gesicherter Platz für die Wiener Wirtschaft - STEP 2025*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/fachkonzept-produktive-stadt.html (visited on 12/03/2019).

[160] Stadt Wien. *Fachkonzept Zentren - STEP 2025 - "Mittelpunkte des städtischen Lebens - Polyzentrales Wien"*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step2025/fachkonzepte/zentren.html (visited on 12/03/2019).

[161] Stadt Wien. *Garteln ums Eck - BaumscheibenpatInnen gesucht*. URL: https://www.wien.gv.at/bezirke/neubau/umwelt/gartelnumseck.html (visited on 05/11/2020).

[162] Stadt Wien. *Smart City Wien - Initial situation*. URL: https://smartcity.wien.gv.at/site/en/approach/progression/ (visited on 05/08/2020).

[163] Stadt Wien. *Stadtentwicklungsplan 2005 - STEP 05*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/step05/ (visited on 12/03/2019).

[164] Stadt Wien. *Stadtentwicklungsplanung*. URL: https://www.wien.gv.at/stadtentwicklung/strategien/step/ (visited on 12/03/2019).

[165] Stadt Wien. *Wien wird WOW - die Austellung*. URL: https://wienwirdwow.at/wow-die-austellung/ (visited on 05/11/2020).

[166] Stadt Wien. *Wien wird WOW - Mach mit!* URL: https://wienwirdwow.at/wow-die-austellung/ (visited on 05/12/2020).

[167] Stadtentwicklung Wien and MA 18 (Stadtentwicklung und Stadtplanung). *STEP 2025 - Stadtentwicklungsplan Wien*. June 25, 2014. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008379a.pdf (visited on 11/25/2019).

[168] Stadtentwicklung Wien and MA 18 (Stadtentwicklung und Stadtplanung). *STEP 2025 - Stadtentwicklungsplan Wien - Kurzfassung*. June 25, 2014. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008379c.pdf (visited on 12/09/2019).

[169] Wien and Stadtentwicklung und Stadtplanung Magistratsabteilung 18. *Fachkonzept Grün- und Freiraum: gemeinsam draußen*. Wien: Magistrat der Stadt Wien and MA 18 (Stadtentwicklung und Stadtplanung), 2015. ISBN: 978-3-902576-95-8. URL: https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008394b.pdf (visited on 11/25/2019).

[170] Marc Zimmerman and Julian Rappaport. "Citizen Participation, Perceived Control, and Psychological Empowerment". In: *American journal of community psychology* 16 (Nov. 1988), pp. 725–50. DOI: 10.1007/BF00930023.