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Design and Evaluation of a Social-Network-Like System for Ad-Hoc Restaurant Meetups Geared Towards Travellers and Digital Nomads

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Wien, 23. Jänner 2024

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Eva Jobst, BSc

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Kurzfassung

Alleinreisende und digitale Nomaden sind Teil eines aufstrebenden Lebensstils, der Flexibilität und Unabhängigkeit bietet, aber auf der anderen Seite es erschwert, neue Beziehungen in neuen Umgebungen aufzubauen. Damit verbunden ist das gefühlte soziale Stigma, alleine in einem Restaurant zu essen. Diese Arbeit untersucht das Design und die Evaluierung einer mobilen App für Alleinreisende und digitale Nomaden mithilfe eines qualitativen Designansatzes. Benutzer:innen dieser Software können Gruppen bilden, die zusammen in Restaurants ausgehen. Der Schwerpunkt liegt darin, wie soziale Netzwerke Reisenden helfen können neue Menschen kennenzulernen, die richtige Gruppengröße festlegen, wie Design die Findability und Discoverability von Veranstaltungen unterstützt und die Vorteile von Restaurantbesuchen.

Die grundlegenden Funktionen eines veranstaltungsbasierten sozialen Netzwerks wurden durch die Konkurrenzanalyse und verwandte Arbeiten ermittelt. In diesem Fall wurde festgestellt, dass das Einhalten von Designrichtlinien so oft wie möglich erfolgen sollte. Sowie sollten die Applikation eine leicht verständliche Struktur ihrer Elemente haben. Zu Beginn wurde entschieden, dass die Anwendung anonym bleibt, daher sind Profilerstellung und Nachrichtenfunktionen nicht Teil dieser Arbeit. Dadurch kann der Fokus auf grundlegende Veranstaltungsmanagementfähigkeiten gelegt werden.

Durch die Durchführung einer Literaturrecherche über Alleinreisende und digitale Nomaden wurde ein besseres Verständnis der Zielgruppe erworben. Mit dieser und einer Online-Umfrage unter 20 Alleinreisenden wurde die Definition mehrerer Personas ermöglicht. Es gab drei: eine für digitale Nomaden, eine für Alleinreisende und eine für die Anti-Persona. Die Informationen aus der Konkurrenzanalyse und anderen Arbeiten wurden verwendet, um die Funktionen und Wireframes zu definieren.

Dies führte zu einer Benutzerstudie mit drei Alleinreisenden. Es wurde der Prototyp unter Berücksichtigung der Wireframes untersucht. Die Kernpunkte waren die Bestätigung, dass Standardrichtlinien befolgt werden sollten, insbesondere da Abweichungen zu Verwirrung führen. Außerdem wurden Verbesserungsvorschläge bezüglich der Discoverability von Veranstaltungen gemacht, wie ihre Darstellung als leerer Zustand am Home-Screen. Die Teilnehmenden vermissten zuletzt Nachrichtenfunktionen und das Erstellen eines Profils.

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Abstract

Solo travellers and digital nomads are part of an emerging lifestyle that, while providing flexibility and independence, also makes it difficult to establish new relationships in unfamiliar settings. With it comes the perceived social stigma of dining alone. This thesis used a qualitative design approach to design and evaluate a mobile application for solo travellers and digital nomads to form weak ties. Users of this mobile app can organise groups to go out to eat together. The emphasis is on how social networking services can help travellers in making new connections, establishing the appropriate group size, how design supports the findability and discoverability of events and the benefits of focusing on restaurant outings.

Using competitor analysis and related work, the basic features of an event-based social networking service were determined. It was found that the design should adhere to standard design practices as much as possible, and that it should have an easily understood structure with elements. From the beginning, the decision was made to keep the application anonymous and to exclude profile creation and messaging features from the scope of this thesis, in order to concentrate on the essential event management capabilities.

A review of the literature on solo travellers and digital nomads was done in order to gain a deeper understanding of the target group. This, combined with the online survey for solo travellers, which received 20 responses, resulted in the definition of the personas. Three were designed: one to represent digital nomads, one to represent solo travellers, and one anti-persona. The features were defined and wireframed using the information obtained from the competitor analysis and related work.

This resulted in a usability study conducted with three solo travellers. The prototype, which had been created based on the wireframes, was examined in the study. The main takeaways were the confirmation in following standard practices, particularly since departing from them leads to confusion. Moreover, suggestions were made to increase the discoverability of events, such as presenting them on the home screen as empty state. Lastly, the lack of features for messaging or account management was missed by the participants.

Contents

CHAPTER 1

Introduction

1.1 Motivation & Problem Statement

It was in November 2021 when I was in a restaurant in Rome by myself, waiting for my ordered dinner to arrive, that I felt solace in the fact that I was not the only one dining alone. It felt awkward to be alone and to do this, usually, social activity by myself. There was another person next to my table who themselves waited for their dinner to arrive. I kept wondering whether it would be inappropriate to have a conversation with that person. I did not approach them. However, years later, when a thesis topic was published proposing a software solution for people, struck by loneliness after many lockdowns during the COVID-19 pandemic, to meet and have dinner together, I was reminded of my solo trip there and the impressions it left me.

I started down the rabbit hole, collecting my memories of my past trips and of my time at the organisation Erasmus Student Network, and was left with two assumptions: people seek companionship and social connections but, often, lack the framework to meet like-minded people. Within my extensive research, I noticed there is an abundance of existing apps, websites, and software for strangers to meet up or simply chat, yet there appeared to be a lack of academic research, articles, or journal entries into planning, designing, or implementing such a solution.

These insights bring forth the necessary focus on the weak ties that are formed with loose contacts. They may provide an opportunity to increase the person's life satisfaction and happiness. This is why an application must be explored and designed that enables travellers and like-minded people to meet in restaurants.

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1.2 Aim of the Work

The aim of this work is to provide a prototype of a mobile application that allows a small group of strangers to meet and spend time together in a bar, café or restaurant. With this platform, a setting will be provided where people can interact with each other in person. Therefore, the main focus lies on the findability and discoverability of available events. The possibility of joining an event should be provided, where specific details on time and location are given, but details on the organiser or participants are not accessible. Additional focus points are the creation and possible deletion of gatherings. With this setup, registration and login are not required.

The application's sole responsibility is to bring people together and thus facilitate the group-finding process. Therefore, possible table reservations must be made by the organiser and are not supported in the app. It will be anonymous, and features that conflict with this, such as profile creation and network building, are not included.

The project should follow modern design guidelines with a well-defined user experience, focusing on a user-centred design approach. The final product is a high-fidelity prototype that will be designed and evaluated in a usability test setting. Personas of the target group will be formulated in an early stage of the thesis, and real-life representatives will be involved with sensible design decisions.

The following research questions will be addressed:

R1 How can an event-based social network support forming weak ties for frequent travellers?

R2 What benefits derive from the focus on restaurant outings?

R3 How can we design support for the findability and discoverability of available events?

R4 What minimum and maximum number of participants are practicable for an event?

In the upcoming chapters the research questions will be referred to by their acronym R1, R2, R3 and R4.

1.3 Methodological Approach

For this thesis, the methodological focus is on qualitative data acquisition in a user-centred design approach. Therefore, the following methods will be proposed with a short explanation of their context of use:

Literature Review The literature review will provide an overview of the sociological patterns of group dynamics and subjective well-being, define the target audience, social networking services, and the related work of this thesis.

Competitor Analysis The competitor analysis takes a detailed look at four products similar to the one proposed in this thesis. The insights provide answers to questions regarding the feature set and the user interface of the application.

Survey The survey provides a clear understanding of the socioeconomic background and experiences of solo travellers.

Personas and Antipersona With the personas and the antipersona, fictional people representing the target group and the non-target group are created.

Use Cases Use cases are specific scenarios that detail how users interact with the product to accomplish their goals. They define the features of the application designed for this thesis.

Scenarios Scenarios sketch the proposed functionality of the software in a digestible way for the usability study.

Wireframes, Mockups and Prototype With these components, the visual options of the software are explored and finalised into a testable prototype.

Usability Study With the usability study, the software will be evaluated, and possible improvements are discussed.

1.4 Structure

This thesis first reviews the literature on related social psychology concepts, such as social capital, subjective well-being, and group dynamics, in order to determine what kinds of relationships solo travellers and digital nomads can develop on their travels, as well as what group size would be appropriate. Next, an overview of social networking services, related work, and competitive analysis will be provided. The specifications and features for the mobile application were established using this data. This thesis introduces the target group with a literature review and focuses on solo travellers with the online survey. With those insights, several personas were created. The features are outlined next, and wireframes and mockups are included for clarity. Furthermore, a detailed description of the study and its findings is provided in the usability study. The research questions are addressed, and the effectiveness of the employed methodologies is evaluated in the discussion section. Everything is summed up in the conclusion, along with possible directions for future research.

CHAPTER 2

Related Concepts in Social Psychology

The following chapter introduces concepts from social psychology. This information defines the types of relationships that can be formed while travelling, as well as those that appear unlikely. Furthermore, with social capital and subjective well-being, the relationships are contextualised in terms of how they benefit travellers. Furthermore, group dynamics explain how group conversations change as the number of participants increases, allowing for the definition of a lower and upper limit for events.

2.1 Social Capital and Subjective Well-being

People, who are inherently social beings, seek companionship and a sense of belonging. Individuals have closer relations, which can be family, romantic partners or good friends, whom they have known longer, can trust and confide in; on the other side are acquaintances like neighbours or work colleagues that are people they see with different regularity and are less intimately involved in the individuals' life. In general, the main predictor of a tight or more loosely-based bond is felt closeness. Those close bonds are called *strong ties* and acquaintances *weak ties*. According to Sandstrom, a weak tie is usually contextualised, meaning "relationships that are tied to a context (e.g., neighbours, colleagues, members of an organization) and do not exist outside of that particular context" [1, p. 129]. It is argued that it takes a long time for a relationship to turn into a strong tie [1], [2].

If the contacts an individual has are perceived as a network, the connection between them and a strong tie is tightly knit and partly overlapping with other strong ties, whereas between them and a weak tie the bond is loose. Only a fraction of a persons' social

network are strong ties, so the logical conclusion is that a person converses more with weak ties on a regular basis. People tend to associate and create close relationships with others who share their values, therefore there is a higher chance that a weak tie will be fundamentally different from them. The benefit of that is how knowledge, opinions, trends and concepts can bridge over and spread easier through various social circles. With strong ties the chance is high it will stay within the circle, the consequences of that is a lower possibility of novel information reaching someone. Nevertheless, it should be noted that stronger ties are more inclined to aid someone, have time for them and an individual is more receptive towards the opinion of a strong tie when a decision needs to be made [1], [2].

The pure existence of a well-constructed social network and interactions with weak or strong ties predict an individual's own feeling of life satisfaction. Another word for that is subjective well-being. This sense of connectedness increases when interacting with weak ties, which can have a positive influence on ones own subjective well-being. Even still, there is disagreement among scientists as to exactly what influences which factor: whether a surge in weak tie connections makes one feel happier and more content or an increased sense of happiness and contentedness leads to more weak tie interactions [1].

The construct of social capital takes the social network of an individual and assesses, among other aspects, the informational and emotional resources of each connection. Based on this, every connection can be classified into *bridging* or *bonding capital*. Coincidentally, weak ties are usually matched with bridging capital, and strong ties with bonding capital. People are more inclined to share their negative emotions with strong ties, which is the reason for their high bonding capital. On the other hand, due to the informational value of weak tie connections, they are tied to bridging social capital [1], [3]. Appau et al. note how a high amount of social capital makes someone more stress-resistant but also they "easily find employment, earn higher income, have more access to valuable information, have more social safety nets and networks of reciprocity, manage conflicts better, have more social control and influence over others, and enjoy social solidarity even with weak ties" [4, p. 1750]. Therefore, also directly related to a better subjective well-being [4].

Someone who feels socially isolated from a group or community is connected to a lower well-being and occupational disadvantages. In addition, they must genuinely want to be part of the group for it to benefit their well-being [4]. As mentioned above, for a connection to turn into a strong tie, it takes a large amount of time. which is why for new residents, often times it can be easier to form weak tie connections first. For students studying abroad, a link was found between a decreased amount of stress and a high amount of perceived belonging, which may be due to quickly forming weak ties [1].

2.2 Group Dynamics in a Social Setting

According to Forsyth et al., for a group to exist, it needs to fulfil a purpose. The purposes can be split into 2 categories: either goal-orientated, like working on a project, assignment, task, or chore together, or seeking companionship, belonging, and socialising. A group is one of the following types: *primary group*, *social group*, *collective* or *social category*. Primary groups are essentially strong ties, such as family or close friends, where the association is still valid even when the group itself is separate, a collective is usually a large and loose group, and a social category are groups sharing characteristics that are non-present in unmembers. Social groups are smaller and in contact over a certain period of time [5]. According to the definitions presented, the groups addressed in this thesis are most likely social groups.

The size of a group can vary from very small of at least 2 people to very large crowds consisting of multiple thousands of people. A gathering of 2 individuals is also called a *dyad*, and whether that falls into the traditional definition of a group is a disputed point. Nevertheless, people naturally seek clusters consisting of 2 people and those have distinctive traits: when one person leaves the gathering it cannot be called a group anymore, and it cannot be split into smaller groups. Splitting a group is only possible when the group exceeds 4 people. Furthermore, they have a structure where likely a leader is required to manage them, and it is unlikely that an individual has a personal relation with every member of the group. In this thesis, the leader is the host of the group dinner. To join the group as an unmember, at least one personal connection is necessary. However, as in this thesis, the main objective is to connect strangers by organising group gatherings using online platforms. The latter point appears to be more valid for groups that are formed in a more traditional sense [5].

According to Cooney et al. once a group counts more than 2 members, the conversations themselves become complex, which only increases with increasing number of members. Particulars like short verbal and non-verbal feedback (nodding or agreeing with statements), turn-taking and speaking time are different in one-on-one conversations than in groups with more people. The previously mentioned increase in complexity with rising participant number of a group leads to a theoretical lesser amount of speaking time for everyone, which severely affects the dynamic where

- many individuals do not try to speak up,

- those individuals who do not speak up turn into observer,

- only a few individuals dominate the conversation and

- the feedback, which is an essential part of a conversation, is scaled down.

This behaviour is "less like a collection of people all talking to each other, and more like pairs of people conversing in front of an audience" [6, p. 23]. Because of this and the complication of who should speak up next, a measure to counteract can be to split the large group into smaller groups [6].

Xu et al. found that events with less than 100 participants increased the probability and amount of formed new weak tie connections, in comparison, to events with a larger population. Their explanation for these phenomena is that in smaller groups the likelihood of meeting a friend or acquaintance is higher, which in turn increases the chance of getting acquainted with their social circle or group. They suggest limiting the number of people in an event and enabling subgroups in order to facilitate better communication between the participants [7].

Su et al. examined several studies using practical approaches in the tourism and hospitality industries, as well as research in psychology on group sizes. Their motivation was to determine what constitutes a small group and when a group can be considered as large. Most of the publications they mentioned define a group as large once there are 7 persons [8]. Consequently, this thesis focuses on small groups consisting of 2 to 6 people.

2.3 Conclusion

This thesis focuses on connecting people while they travel, yet since they do not stay put for extended periods of time, it seems that only weak ties can be made. Due to this, the emphasis of this thesis is on bridging capital and weak ties. This is not a drawback because weak ties allow fast traversal of new information to different social circles, increase life satisfaction and strengthen one's social capital. Numerous career advantages, resilience, and endurance are associated with strong social capital.

Group dynamics, group sizes, and their interactions must all be taken into account in order for people to turn strangers into acquaintances and develop weak ties. It seems that weak bonds are more difficult to create in groups bigger than 100 persons. This would exclude dining events such as community potluck picnics or reservations for a whole restaurant from this concept. Furthermore, 6 people seems to be the magic number for a group activity, which would restrict the event from 2 to 6 people. The category this size falls into is a social group. The individual who creates the event on the platform will be the group leader, who takes responsibility for planning and directing the activity.

CHAPTER 3

Digital Landscape

3.1 Social Networking Services

With the constant advancement of the Internet and its services, a noteworthy development is the spread of communication platforms called social networking services (SNS), synonymous with social networking sites, whereas a user can create a profile, connect with others by building a network of connections, communicate with groups or members of their own network through private messages and share and browse feed-based content [9], [10], [11]. Because profile creation and maintenance are beyond the scope of this thesis, the project will not be able to support all features associated with SNS.

SNS are a category of social media sites [11]. Most users have profiles on multiple SNS with which they visit and interact daily. A feature that was popularised with dating apps is using location to find profiles. Notably, millennials use the mobile version of the platforms more frequently [9], [12]. This, combined with the fact that solo travellers may not bring a computer with them and that digital nomads and solo travellers may prefer software accessible on their mobile smartphones, is why a mobile application should be the targeted platform of this thesis.

Well-known SNS are Facebook, Twitter, Instagram, LinkedIn, Meetup, and Pinterest [10], [11], [12]. Their differences become apparent in their served objective, fulfilled need and manner of use [9], [11]. What this basically means is that they can provide social, emotional, or informational resources that can be consumed through text, image, or video [9]. As an example, a social need can be countered with using dating apps where a user is matched to another person they share similarities with; before the match they saw each other's profiles, that contain images, video or text fragments to evaluate compatibility [12].

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With social media platforms, it is easier to maintain weak ties while also lowering the barrier to expanding your network and finding new contacts [3]. This is why it may be beneficial to create a digital platform for digital nomads and solo travellers to connect.

As Meetup is an event-based SNS maintaining relations is not possible solely through using the features of the service as they lack interaction possibilities [13]. Regardless of that, users have reported that they have found loose contacts through attending events that were shared on Meetup, often maintained by seeing each other on other events or groups. Seldomly, those acquaintances turn into close friends. Those weak ties can also turn into valuable resources, like for finding job opportunities [12].

3.2 Related Work

The related works that encouraged interactions between strangers and whose special function was to arrange for their in-person meeting and facilitate in-person conversations are listed in the following section. There were no limitations on the location and setting in which they are situated, and there were no limitations on the activity that they conducted, in contrast to this thesis' study, which concentrates on having meals together in restaurants.

The existing research went further into a number of settings, situations, and circumstances where a need to facilitate stranger interactions was identified. These include when using public transportation to commute, at work, during conferences, and when college, university, and high school students are on campus. The vast majority of the research was related to proximity.

3.2.1 Design Principles

The adoption of popular and widely-accepted UI patterns, which users have often previously seen and interacted with enough times to know what to anticipate, runs throughout several of the cited studies. This is demonstrated by the choice made by Müller et al. [14], Athanasopoulou et al. [15] and Cuotto et al. [18] to adhere to the design principles of Android [23] and Apple [24]. To exemplify this, the logo and menu are placed on the top portion of the screen and usually consistently present this component there [15]. In addition, errors are usually shown with the colour red, toast messages are used to communicate essential information, and screens are designed considering the way users usually scan it, namely from the top left corner [14], [15]. In addition, the elements of a screen are arranged consistently, beginning with the component's positioning and continuing with its design [15]. With the provided data, it appears that following standard practices will reduce the amount of onboarding effort and informational texts required in the application, so it is a reasonable decision to apply them to the designed application in this thesis as well.

Similarly to discoverability, users should be able to see on a screen where they are right now and what they have done. According to Müller et al. it needs to provide answers to the questions "Where am I?" and "What exactly happened?". This is related to giving the software a logical structure and limiting the number of steps needed until the main screen and main interaction possibilities are reached. By merely providing the necessary information about supplying the username, Müller et al. were able to realise this. The user is immediately sent to the main screen so they can start talking with other commuters [14].

3.2.2 Defining Time and Place of an Event

Several methods have been discovered to ensure that two people arrive at the same location: asking for permission to share locations [16], proximity-based [17], and sharing the same network [18]. Allowing users to manually enter a location instead of requiring Bluetooth or GPS permission [20] is a possible solution as well. However, it is unclear what happens when a user leaves the designated radius on proximity-based systems. Users may not receive updates if they have left an area [18]. Scheduling time and place is time-consuming and requires users to remain in place [19]. Chen et al. used a negotiating-based approach to choose the time and place, but people were not engaged with this idea [20].

3.2.3 Anonymity and Account Management

Cuotto et al. [18], Seeburger et al. [21] and Camacho et al. [22] designed systems that let strangers talk anonymously in limited areas. The decision to preserve anonymity for these platforms was made for a number of reasons, including preventing bias and discrimination and a greater sense of personal security. It should be noted that in the case of Cuotto et al. [18], this perception may have arisen as a result of the programme's chat component and its limited radius, which gave users the feeling that the likelihood of harassment and unwelcome advances was decreased.

While the system does not offer protection against discrimination and harassment, both Cuotto et al. [18] and Seeburger et al. [21] implemented software with protective layers to guarantee user security. Exemplarily, only nonsensitive information is made available to other users on anonymous sites, enabling individuals - especially those nearby - to stay undiscovered. A discussion on user blocking is described in Seeburger et al. [21]. These features have been kept out of scope for now.

3.3 Competitor Analysis

The competitors of this thesis are introduced and analysed in the following section. The four products *Hey! VINA*, *Couchsurfing*, *Together.Social* and *Meetup* were chosen. Due to their market availability, attempts to solve the same or similar problem, or general

similarity, those products are suitable. They differ in their depth and involvement with their event management features, ranging from Hey! VINA where event management is only a minor feature, to Meetup, which is a full-fledged event management application. With the insights, decisions on features, event discoverability and findability, event information, and branding can be made. The personal information present of the users in the screenshots is censored to protect their identity.

Before the competitors can be analysed, findability and discoverability need to be clarified and their potential use cases evaluated. The following definitions are established for them:

Findability How simple it is for the user to locate information that they know exists [25]

Discoverability How well unknown features and information are detected [25]

As a result, findability and discoverability are terms that are related but not identical in that they both describe how users interact with information and components on an application. Aurora Harley illustrates the findability with the example of someone looking for their keys. They know the keys are somewhere in the house, but they do not know where. On the other hand, she defines discoverability as discovering something you did not even know you needed [25]. According to Jen Cardello findability and discoverability is linked with the quality of the information architecture and navigation structure [26].

In relation to the context of this thesis and the research question it aims to address, findability design patterns are defined as those that help users in locating events. With this definition, the focus is on search, filter, sort and navigation. Providing tips and hints on existing features and event prioritisation is related to answering the research question in terms of discoverability. This is similar to the insights of Müller et al., where the application needs to provide a logical structure so the user is aware of where they are and what happened [14].

3.3.1 Competitors

Founded in 2002 [27], Meetup operates as a platform designed to assist individuals in finding and building communities centred on common interests. It provides users with the opportunity to explore and engage in local events and gatherings organized by individuals who share similar interests, thereby fostering the cultivation of in-person connections [28]. The analysed version is 5.2.12 [13]. Figure 3.1 displays relevant screens of Meetup.
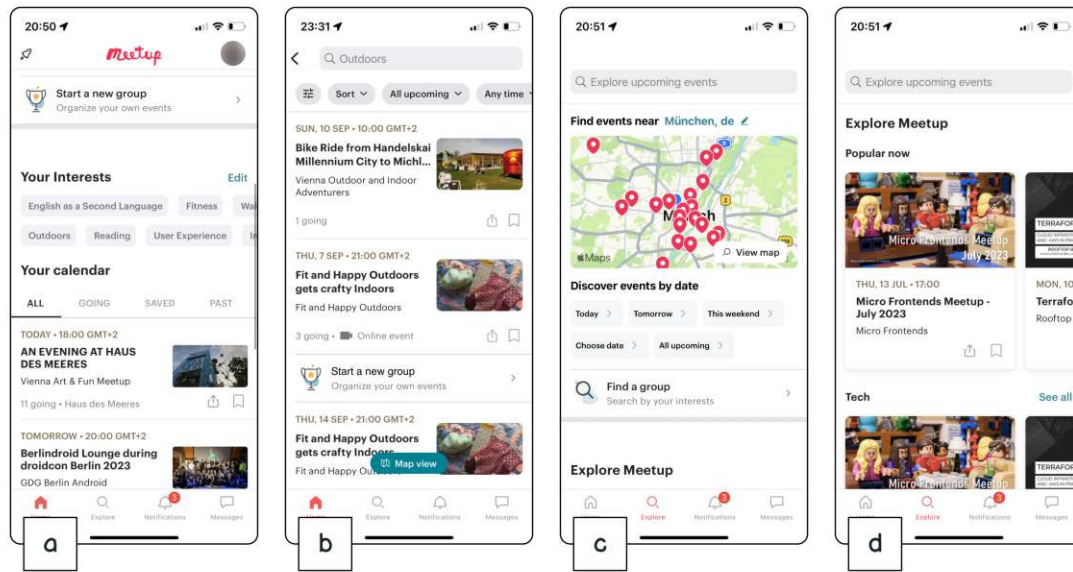
Figure 3.1: The screenshots show key screens of Meetup. (a) Home screen. (b) Search component in Home. (c) Explore screen in its initial view. (d) Explore screen scrolled down [13].

Together.Social, presumably founded around 2017 [29], operates as a social media platform with the primary objective of addressing loneliness by enabling the establishment of connections between its user base. The platform is dedicated to fostering a community and encouraging individuals to interact with like-minded peers who align with their shared interests and values. It is most active in and around Salzburg in Austria [30]. The analysed version is 3.5 [31]. Figure 3.2 displays the relevant screens of Together.Social.

Hey! VINA was established in the year 2015 [32] as a dedicated social networking platform tailored for women, aiming to facilitate connections and the formation of friendships among women. It empowers users to discover like-minded friends grounded in shared interests, by offering a safe environment where women can make new connections and nurture close relationships [33]. The analysed version is 4.0.1 [34]. Figure 3.3 displays the relevant screens of Hey! VINA.

3.3.2 Findings

Features

First, it should be mentioned that the primary functions of Meetup and Together.Social are based on event management. On the other hand, the primary activity of Hey! VINA is friend matching, not necessarily group gatherings. The main purpose of Couchsurfing is to connect guests and hosts.
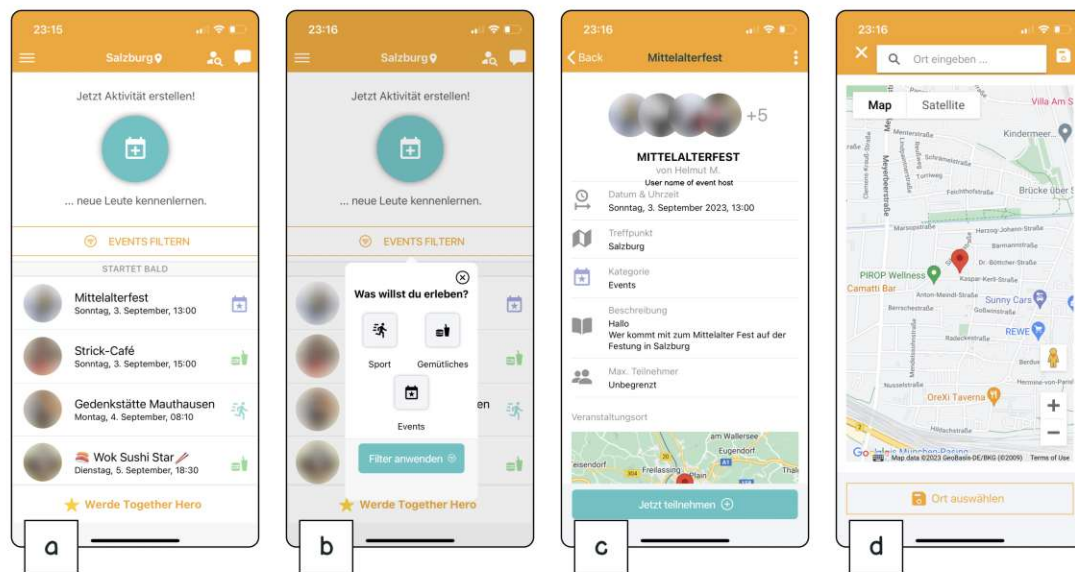
13

Figure 3.2: The screenshots depict features of Together.Social. (a) Home screen. (b) Event category filters. (c) Event detail page. (d) Location change view [31].
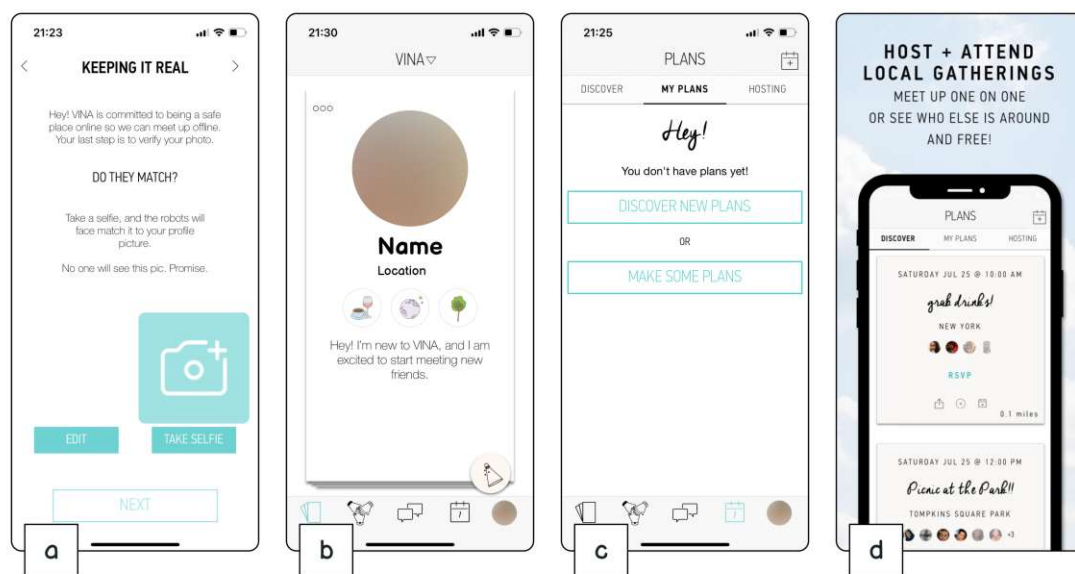

Figure 3.3: The screenshots show key screens of the Hey! VINA app. (a) Verification process. (b) Matching. (c) Empty state of the Plans screen [34]. (d) Filled state of the Discover screen [35].
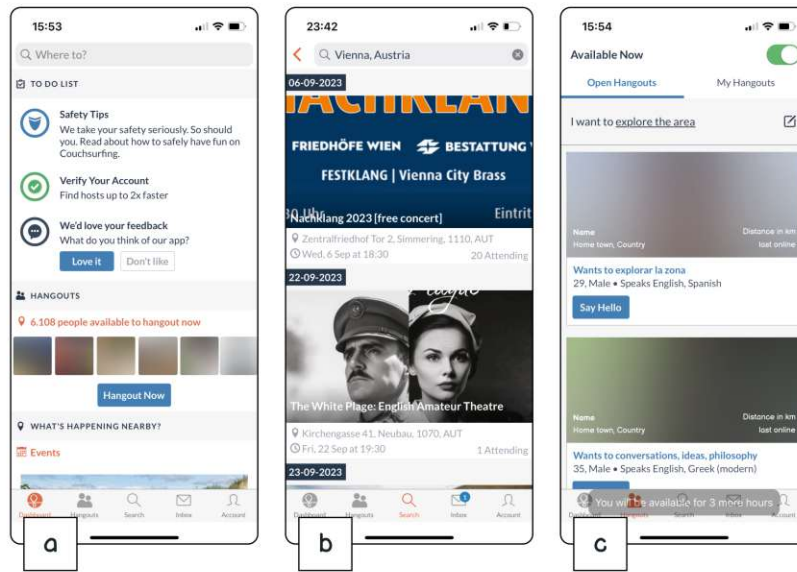
Figure 3.4: The screenshots highlight important features of the Couchsurfing application. (a) Dashboard. (b) Search displaying events in Vienna. (c) Hangouts with open availability [36].

Nevertheless, these platforms have the essential event management functionality. In addition to creating, updating, and deleting events, this also entails searching for events, examining their detailed information, and having the option to attend or decline events. In all of these platforms, there is a section of upcoming events that the user participates in. In addition, Meetup shows bookmarked events, a history of joined events and a dedicated screen for notifications.

Discoverability and Findability

Exploring events takes centre stage in Meetup, possibly even more than event management. Several factors support this notion. As seen in Figure 3.1(c) and 3.1(d), there is a dedicated Explore screen for event discovery. Discoverability features prominently on the Home screen, exemplified by a behaviour of the "Your next events" component. When users have not joined any groups or there are no upcoming events in their joined groups, an empty state encourages further exploration. As shown in Figure 3.1(b), by clicking a category in the "Your Interests" section, users are directed to the search component within the Home screen, that is essentially another component enabling exploration. It is noteworthy that the calendar view in Figure 3.1(a) is exclusively employed for joined events, while other visual elements like the search bar and map view are utilised for unknown events.

Similarly, event discoverability plays a pivotal role in Together.Social. Figure 3.2(a) shows that upon opening the app, users are immediately presented with a list of upcoming events, with priority given to their created events. These events are categorised as "My events", "Starting soon", "this week", and "even later". Figure 3.2(a) depicts how when a user has not created any events yet, the "My events" section remains hidden. To explore events in a different location, users can modify their designated location settings.

With Hey! VINA prioritising one-on-one friendships by matching, group event management serves as a secondary functionality. This is evident as event discoverability is absent from the start screen and the matching feature dominates after the launch of the app, as seen in Figure 3.3(b). Events are accessed via the Plans screen presented in a card view in Figure 3.3(d). When opening the Plans screen, which is presented in Figure 3.3(c), users encounter a tab bar featuring "Discover" for nearby events, "My Plans" for events they intend to join, and "Hosting" for events they are organising.

Couchsurfing emphasizes connecting hosts with guests, therefore group gatherings are only a minor feature. However, as seen in Figure 3.4(a), they prominently feature upcoming events on their Dashboard, displayed upon app launch, showcasing nearby events. A "See all" button directs users to the Search screen, revealing all nearby events. The default Search screen displays hosts, available travellers, and nearby events. To find events at a different location, users must perform a specific location-based search. Outlined in Figure 3.4(b), are the single events presented in a card view.

User Interface Patterns

Generally, events are displayed horizontally or vertically. In Figure 3.1(d) it is seen that Meetup uniquely employs a horizontal scroll on its Explore screen, when the app splits the events into categories. In all other cases, including within Meetup, a vertical scroll is used. Vertical scrolls are typically infinite, allowing users to view all published events. An exception is on the Dashboard screen of Couchsurfing which shows three events in the "Upcoming events" section and offers a "See all" button for the complete overview. In contrast, on Meetup, in the horizontal scroll list, users encounter a "See all" button after ten items. Together.Social presents, as depicted in Figure 3.2(a), the complete event overview as an infinite scroll list on the Home screen.

Events within an event overview section are listed vertically as either simple list items, akin to on Together.Social or Meetup, or as cards, as employed on Hey! VINA and Couchsurfing. Event details on all platforms include date, time, and title. Only Meetup includes a group name. All platforms, except Together.Social, as evident in Figure 3.2(a), display the number of participants and location, while Together.Social features the host's profile icon and the category icon. Hey! VINA includes participant avatars and distance to the location, as seen in Figure 3.3(d). Meetup and Couchsurfing use a header image.

Meetup and Couchsurfing maintain consistent terminology: "Events" for gatherings and "Friends" for connected users. Meetup employs "Groups" for a collection of people and "Explore" for event discovery. Couchsurfing distinguishes between spontaneous "Hangouts" and planned "Events". As presented in Figure 3.2(b), Together.Social sometimes refers to events as "Events" or "Aktivität" (activity) but also use the term "Events" as a subcategory of their gatherings. Yet in other instances, like "Freunde" (friends), it remains consistent. Hey! VINA employs a branded approach with "Vinas" for friends, "Places" for events, "Ditto!" for matches, and "Hey!" for both initial matching and messaging.

Filter and Sort

Meetup offers a variety of touchpoints for event discoverability, resulting in diverse filter options. The user interface components for filtering include chips, tab bars, search bars, drop-down menus, and bottom sheets. On the Home screen, users can filter events by category or interest. Figure 3.1(a) shows the calendar section that provides tabs for viewing all events, upcoming, saved, and past. When accessing the "Search" component within the Home screen, events are initially sorted by "Relevance" but can be rearranged to be sorted by date in ascending order. Filter options such as date, time, venue type, distance, and category are available as filter chips on this screen, which is presented in Figure 3.1(b). The Explore screen provides a search bar for location-specific event searches, along with date-specific filter options accessible through chips.

Together.Social events are sorted by date in ascending order, as evident in Figure 3.2(a), displaying only those at the chosen location. To view events in different locations, users click the location, opening a new screen with a search bar and map view. Figure 3.2(b) illustrates that users can filter events by categories like "Sport", "Gemütliches" (cosy get-together), and "Events" under the "Events filtern" (filter events) button.

Hey! VINA lacks apparent filter options. The events are sorted by proximity in ascending order, as outlined in Figure 3.3(d), with the closest events shown first.

By default, Couchsurfing filters events by "Current location" and arranges them by date in ascending order, akin to Together.Social. As illustrated in Figure 3.4(b), users can change the location on the Search screen by clicking the search bar and specifying their desired location.

3.3.3 Discussion

Features

The platform should provide a robust set of features for event creation and management that encompasses key actions such as event creation, editing, and deletion. Furthermore, as seen on Meetup, the platform should offer a convenient feature that allows users to view a list of events they have previously joined, providing quick access to their event history and a component to see recent notifications.

For a more detailed view of a specific event, the platform should offer a dedicated event page that provides participants with all the essential information they need to join the event and locate the meeting point, increasing the overall user experience.

Discoverability and Findability

There are two key scenarios where infinite scrolling is implemented: after conducting a search with search results, as seen on Meetup and Couchsurfing, or on the event overview screen, as applied by Hey! VINA and Together.Social, which allows users to explore upcoming events they may find interesting. Filters will be added to allow users to search more specifically. It is important to note that Together.Social serves as an example of potential drawbacks. Displaying the complete event overview with infinite scrolling directly on the Home screen without a proper filtering system can pose challenges, especially when users cannot filter by date. This may be problematic, particularly in areas with active communities.

An alternative approach, exemplified by Couchsurfing, involves showing a limited number of upcoming events on the Dashboard screen upon app startup, with the option to view more events via a "See all" button.

To address this, it was decided to provide a dedicated screen where all events are displayed, potentially with an infinite scroll, and only show the joined and future events on the Home screen. Displaying those upcoming events on the start page can be a useful reminder and provide quick access to them.

Events are typically showcased in a vertical scroll list. On the Meetup platform, event discoverability is structured differently, with events categorised and displayed in a horizontal scroll format, featuring a limited number of events at a time. If additional events are available, a button with an arrow leads users to the Explore page, where they can further narrow down their search by category. Combining both horizontal and vertical scrolling could offer a captivating user experience.

Meetup prioritises event discoverability by placing it in a prominent spot on the bottom navigation. With this placement, it signals its importance and ensures users can quickly access this feature. This decision aligns with the recommended practice of Google's Material Design [37], emphasizing the significance of primary actions, particularly on mobile devices. In the context of this thesis, discoverability may be equally important, justifying a comparable design choice.

The Discover screen, inspired by Meetup, is a component that allows users to browse and search for events. It includes filtering options to accurately search for events based on their schedule.

Travellers, often with limited time, may seek events before or during their stay. Infinite scrolling without filtering in apps like Hey! VINA or Couchsurfing could lead to frustration, necessitating a better solution. This thesis will create an application that, at the very least, allows filtering based on time and date. Together.Social lacks date filtering, cluttering their start screen with events in an infinite scroll. Travellers, unable to view events on specific dates, face challenges planning in advance. Similarly, Hey! VINA lacks an ideal filtering system. Their limited filtering shows events in a set location without the option to change it, which is ideal for local communities but not for the flexible lifestyle of travellers. For the target audience of this thesis, adding date and location filters is crucial to enhanced usability.

Event Information

On the event overview page, it is necessary to include the kind of information that lets users quickly decide if they are interested in an event. Therefore, data such as date, time, title, and location or address are required. The title will be the name of the venue. Since profiles are not part of this anonymous application, there is no need to display avatars or profile images. The inclusion of a header image is debatable, as it could visually distinguish events and make them unique. However, it was decided not to include any pictures initially. To provide users with an idea of seat availability, the number of available and reserved seats will be shown. The distance from user to the location will not be included as it may change quickly and users may be looking for future events.

Branding

In app design, using clear, consistent, and straightforward terminology is a recommended practice [38], which is followed by Meetup and Couchsurfing. However, Together.Social and Hey! VINA deviate for different reasons: Together.Social uses terms inconsistently, sometimes interchangeably, like "Aktivität" and "Events" for the same concept or using "Events" as the main category for gatherings and as a subcategory as well. Hey! VINA adopts a highly customised approach to terminology, which can be advantageous but may become too distracting. Striking a balance, the choice for this thesis is to follow

practices and still find branded terms. For the app name *dinner stories* will be chosen. For gatherings, the term *group dinner* will be used, conveying the host's intent for a meal with a group. But also with this term the word dinner, which is part of the app name, is repeated. To maintain simplicity and avoid excessive branding, *participant* for event attendees will be used.

3.4   Conclusion

This chapter introduces and highlights the features of social networking services. There are not many similarities between this application and a traditional SNS as it is an anonymous event-based SNS. Still, it is possible that such an application will help solo travellers and digital nomads find weak ties and improve their social capital and well-being. The related work showed the benefits of using well-known design patterns in mobile applications, along with the idea that time, date, and location should always be set by the host. A competitor analysis that looked closely at the competitors Meetup, Together.Social, Couchsurfing, and Hey! VINA was done in order to build on these findings and offer new ideas. The essential event management functionality, which includes adding, editing, and removing events, is shared by all of these competitors. They also provide the ability to search for events, view detailed information, and attend or decline an event. These features would also need to be included in the application. To prevent endless scrolling, the Discover screen will include filter options. Additionally, each event will have a dedicated detail screen with more information.

Table 3.1: Papers researched for Related Work

Author(s)	Year	Title	Short Description
Müller et al. [14]	2018	Honeypot: a socializing app to promote train commuters' wellbeing	Honeypot is a mobile app used during train trips, where commuters sharing the same ride may connect and meet up in person. Users can chat privately or in groups based on shared interests.
Athanasopoulou and Koutsakis [15]	2015	eMatch: an android application for finding friends in your location	eMatch, an Android app, matches people within a 16 km radius who share similar interests by utilizing the algorithm EgoSimilar. In addition to their matching process, eMatch's core features include a social network with connections and messaging capabilities.
Kumar et al. [16]	2021	Friendbook: A New Friend Recommendation Application	Friendbook is an Android app matching a user to potential future friends on basis of their lifestyle, which is a combination of shared interests and their frequently visited places.
Eagle [17]	2004	Can serendipity be planned?	Serendipity is a mobile app used in the office to promote better collaboration and make it easier for coworkers to connect and get to know one another. When two coworkers are within a 10-meter radius of one another, the matching algorithm determines if they should be paired, and if so, notifies them.
Cuotto et al. [18]	2016	Idliketoknow: a mobile tool for interacting with strangers in a collocated area	Idliketoknow is a mobile app that encourages conversation between strangers who are in the same waiting room. To encourage face-to-face connection, it makes use of a message board where users may ask questions anonymously and receive responses in a thread.
Paasovaara et al. [19]	2016	Next2You: a proximity-based social application aiming to encourage interaction between nearby people	The mobile app called Next2You helps users become more aware of the people they regularly interact with. When users are in close proximity to one another, new information from their profiles is gradually revealed.
Chen and Abouzied [20]	2016	One led is enough: Catalyzing face-to-face interactions at conferences with a gentle nudge	CommonTies is a wristband that encourages strangers to connect spontaneously during conferences. The matching algorithm makes decisions based on information from LinkedIn. When two matched users are in close proximity, their wristbands light up in the same colour.
Seeburger et al. [21]	2012	The sound of music: sharing song selections between collocated strangers in public urban places	Capital Music is a mobile app, where nearby people may anonymously share their song preferences. On a board that is visible to everyone around, the album covers of the currently-played songs are posted. Users have the option to privately chat with other users and leave a "like" when they enjoy a song.
Camacho et al. [22]	2015	TrainYarn: Probing perceptions of social space in urban commuter trains	The smartphone app called TrainYarn was created to promote conversation among train commuters. In addition to sending passengers private or group messages, users can create a profile that details their hobbies.

<div align="right">

CHAPTER 4

</div>

Stakeholder Definition

This chapter describes how to define the target group and its fictional representations using personas. The data used to design the representation of a solo traveller was gathered by combining two research methods: literature review and survey, which provide both shallow and deep insights into the stakeholders. In the case of digital nomads, only a literature review is used, whereas the antipersona is based on a specific online survey entry.

The terms stakeholder, user, and target group will be defined as they are used frequently in this and subsequent chapters. According to Brugha et al. a stakeholder is someone who has passion about the product, object, or business and a certain leverage over it [39]. This applies to users in a user-centred design approach and makes a user a stakeholder. Because users are the only stakeholder defined within this thesis, the terms will be used interchangeably, as they refer to the same people.

4.1 Introduction to Solo Traveller

Within the tourism industry, the sector that is gaining the most traction is that of solo travel [40]. This development can be attributed to increased hedonism and individualism and the growing acceptance of pursuing, usually communal, interests and hobbies alone. In research, there is no consensus on the definition of solo travel, with many limiting it to the state of arriving alone at the destination and traveling alone over the entire or main duration of the journey, depending on the relationship status of the traveller or the fact that they live in a single-person household [40], [41]. There are various synonyms for solo traveller, such as solo tourist, independent, single, unaccompanied, solitary, or alone traveller [42]. *Frontier traveller*, explicitly seek activities and locations that are perceived as dangerous. The majority of frontier travellers are men [42]. The definition to which this thesis applies is that a traveller arrives at their destination alone and spends a major part of the journey on their own. They may decide to travel alone out

of their own internal motivation or because they do not have another person to travel with. Nevertheless, even with this definition, a solo traveller may meet fellow travellers or locals they decide to spend time with or participate in group tours. Group tours are especially seen to become more popular within the solo travel segment [41].

There are several benefits associated with solo travel. They can be summarised with a gained feeling of empowerment and independence, in combination with an increased proactive approach to socialising with strangers and seeking chances to socialise due to the circumstance of being alone, e.g. with the participation in group tours or staying in hostels. This shows the duality of solo travel, where people choose to travel alone but still want to connect during their travels [41], [42], [43]. However, one should not forget that some solo traveller explicitly do not want to socialise during their journey [41]. Furthermore, they are more likely to use the flexibility, uncompromising nature and control they have over their own travel choices by acting spontaneously, changing their travel plans and taking more chances [40]. As solo travellers interrupt their daily routine by travelling by themselves, they are more likely to turn their thoughts inwards and self-reflect [43]. Thus, solo travelling is considered to be a transformative experience [41]. As it was previously hinted on, a solo traveller might choose to travel alone out of necessity or on their own choice. They may travel alone due to the simple fact that they do not find a person to travel with [41]. However, a solo traveller may also consciously make the choice to travel alone despite having travel partners, whereas the catalyst may be the recent experience of a positive or negative change in life. Those trigger transformative experiences during travel [43].

The need to socialise just shows that one challenge of solo travel is loneliness and boredom, where another sparring partner is missed to share activities and adventures with. This is reinforced by an increased sense of danger. Furthermore, other issues arise with the neglect of the tourism sector to accommodate the needs of solo travellers, discrimination, and insufficient service. Specific examples are the lack of hotel rooms for one person, where most solo traveller have to pay for a room for 2 people, or turning away solo traveller at restaurants [40], [41], [42]. Especially, the latter problem is caused by the social stigma and felt with a significant level of discomfort. This discomfort often leads to solo traveller refraining from eating at restaurants at all or making measured decisions regarding the location. It should be noted that those feelings are most prominent for dinner, thus felt for a lesser degree at breakfast and lunch [44]. The project on which this thesis is based will primarily be used to schedule group dinners due to perceived social stigma.

A considerable amount of previous research on solo travel focused on the motivations and challenges of women travelling alone [40]. This is often a conscious choice for them and not because they lack a travel partner [41] with the underlying motivation of empowerment, self-gratification, escapism, to leave their comfort zone or connect with strangers [40], [42]. On the opposite side is the increased sense of danger and worry of experiencing

sexual harassment [41]. Feeling unsafe at times is also something that has been reported by male solo traveller [40].

4.1.1 Demography

In their respective applied methods conducted by Matsuda et al., Bianchi and Abbessian the demographics of the analysed solo travellers show that a majority of them are in their twenties or thirties, with slightly more participants being female than male [40], [42], [43].

4.2 Introduction to Digital Nomads

The increasing availability of the Internet and the possibility to work outside of office spaces gave rise to a group of employees and workers who frequently switch places while following their profession in the digital sector. They are called digital nomads, neo-nomads, global nomads, modern nomads, new nomads or lifestyle migrants, with digital nomad being the more prominent and well-known classification [45], [46]. As for digital nomads, the freedom to choose the next destination and duration of stay is one of the core aspects; they are not to be confused with *nomadic workers*, who frequently switch places due to their profession where location and duration are chosen by the employer [47], [48], or *telecommuter workers*, who usually work from one place, that is, their registered residence [49].

The life of a digital nomad is defined by the flexibility of choosing the next destination to exclusive locations and the length of stay without the need for employer approval [45]. The digital nomad is a tourist as well because of their preference on travelling to places with a diversity of options to explore, things to do and sights to see. Explicit motives for digital nomads can be found in freedom and flexibility over their own time management, routine, location choice, and autonomy [46]. As a consequence of the repeated uprooting and the lack of a fixed schedule and office location, digital nomads often are troubled by social isolation, "cabin-fever" [47, p. 6] and struggle with their work-life balance; those challenges are mentioned multiple times [46], [47], [49].

Within the already mentioned aspects of digital nomadism, such as social isolation and frequent location changes, they use online social networking platforms, like *Reddit* [50] or *Meetup* [51] and forums, such as *NomadList.io* [52] to find like-minded people and connect. The primary aim in that lies on gathering information and support in future destinations from people who already visited the place [48].

In general, digital nomads seek distant, exotic and well-known places for their journey "in which their demographic privileges are maximised, along with their hedonistic pleasures" [49, p. 33]. In order to fulfil this need for adventure and self-gratification, those locations

usually should allow them to pursue their leisure activities (e.g. surfing, hiking, backpacking or skiing). Digital nomads rarely mingle with locals and are unconcerned with the culture of their travel destination. Additionally, they usually do not stray from their own bubble, stay with fellow traveller and expats and pursue typical travel activities. This is a discrepancy to their own self-perception of having a more genuine and legitimate travel experience than regular tourists. Attractive places for digital nomads are Chiang Mai (Thailand), Ubud (Bali), Phuket (Thailand), Medellín (Colombia), Vietnam, Cambodia, Colombia, and Lisbon (Portugal) [47], [49].

4.2.1 Demography

In a series of interviews with 38 participants conducted by Thompson [49] the socioeconomic background of self-described digital nomads were analysed, which found that a majority of the nomads have privileged backgrounds: they originate from a country with a powerful passport, are white and between their twenties and forties, single, without children and primarily only know English.

In general, digital nomads work in professions that only require a computer and available internet connection to fit their location independence. Consequently, a majority of work in the IT, creative or marketing sector with specific job fields being software engineering, web development, graphic design, computer technical support, digital marketing, consulting and content creation [45], [47], [49]. Digital nomads generally depend on work in the gig economy and freelancing, using online platforms to acquire clients and projects [47], [48].

4.3 Online Survey

The following section serves to introduce, analyse, and discuss the online survey that was published to gain detailed insights into the socioeconomic background of the target group and qualitative data of their experiences on their travels. This information is necessary for the creation of the persona.

4.3.1 Methodology

A qualitative and quantitative approach was used in the survey's design, with an emphasis on both closed- and open-ended questions. Survey questions were designed to best obtain the data needed to gain a deeper understanding of the target audience and to gather the information required for persona construction. The questions were divided into three categories: demographics, solo travel experience and socialising behaviour.

The decision was made to use a commercial product as a tool. Microsoft Forms [53] was chosen as the solution due to the specifications and required features. On Google Forms [54], a draft of the questionnaire was developed and reviewed. The final version was made on Microsoft Forms with the suggested improvements by the reviewer.

Questionnaire Design

Generally speaking, the questionnaire was made to address the questions that must be raised to collect the information required for the development of personas. The primary stakeholders in this thesis are solo travellers, who were the focus of the survey. The decision was made to keep the survey as brief and precise as possible, with an expected duration of roughly 5 minutes, in light of the experiences shared in a blog post [55].

The survey was introduced with the following text:

> For my master's thesis at the Technical University in Vienna, I'm designing a mobile application where solo traveller and digital nomads can meet up and connect in a restaurant setting. The app enables the creation and participation of self-organised spontaneous gatherings in restaurants, cafés, bistros, etc. with the aim to spend a small amount of time with new people and have a meal together.
>
> The goal of this survey is to find out more about solo traveller and their experiences.
>
> The survey will take approximately 5 minutes to complete.

Consent Agreement

Participants had to accept the terms and conditions of participation prior to the survey's first question. To summarise, the information was obfuscated and anonymised, so no attempts can be made to determine a person's identity. They were informed of their rights in relation to the thesis and the survey, including the option to withdraw their consent at any time. The consent agreement is shown in full in the following quotation.

> This survey is conducted for the development of the master's thesis "Design and Evaluation of a Social-Network-Like System for Ad-Hoc Restaurant Meetups Geared Towards Travellers and Digital Nomads" at the Technical University in Vienna, Austria.
>
> The owner of the form is subject to professional secrecy and is bound to data confidentiality. In order for your statements and data to be stored and evaluated, we require your explicit consent within the framework of the General Data Protection Regulation (GDPR).
>
> All information about your person is anonymised for the evaluation and analysis of the data, so that it is no longer possible to draw conclusions about your person.
>
> Individual quotes may be included in publications, but these are anonymous and cannot be attributed to you personally.

This consent is voluntary. You can refuse or revoke this consent at any time. Such revocation or refusal will not have any negative consequences for you.

You can send the revocation of consent by e-mail to the contact person indicated. Thereupon, all your personal data will be deleted immediately.

If you have any questions, comments, or concerns, you can contact the owner of the form:

Eva Jobst

eva.jobst@student.tuwien.ac.at

Analysis

The qualitative data that was gathered by open-ended questions with short- and long-text replies are conducted as thematic analysis in a deductive approach [56]. The following questions were coded after the described paradigm:

- What motivates you to travel alone?

- What was most important to you the last time you travelled alone?

- What was your most memorable experience on your first solo travel?

- What was your most frustrating experience travelling alone (if there are any)?

Descriptive statistics [57] were used to analyse closed-ended questions. Most questions about the respondents' demographics and social behaviour were interpreted using this method.

Participants

Participants were recruited through various survey exchange and sharing platforms, such as *SurveyCircle* [58], *SurveySwap* [59] and the subreddits */r/TakeMySurvey* [60] and */r/SampleSize* [61]. Only those who had at least one solo trip prior to the survey's publication were allowed to take part. In total 20 respondents were collected.

4.3.2   Findings and Discussion

Demographic

Table 4.1 demonstrates the socioeconomic background of the sample in this survey. In total 20 people responded. The data presented in the table originate from mandatory questions, which means the sample size for each variable is 20. The options without responses have been omitted for legibility reasons. The variables are described in more detail in the following paragraph. Table 4.2 lists the professions of the respondents. This data was not coded due to the manageable sample size, diversity of jobs and their industries and impossibility of coding due to loss of granularity.

Variable	Options	Study Sample (N=20)	
		N	%
Gender	Female	11	55 %
	Male	8	45 %
	Non-Binary	1	5 %
Age group (years)	20-29	12	60 %
	30-39	4	20 %
	40-49	3	15 %
	50-59	1	5 %
Current location	Germany	6	30 %
	Unites States	3	15 %
	United Kingdom	3	15 %
	Netherlands	1	5 %
	Australia	1	5 %
	Finland	1	5 %
	Switzerland	1	5 %
	Austria	1	5 %
	Poland	1	5 %
	India	1	5 %
	Canada	1	5 %
Completed education	Upper Secondary School	1	5 %
	Undergraduate (Bachelor)	9	45 %
	Graduate (Master)	6	30 %
	Postgraduate (PhD)	2	10 %
	Other	2	10 %
Amount of times travelled alone	1-3	11	55 %
	4-6	4	20 %
	More than 10 times	5	25 %

Table 4.1: Demographic insights of survey *Demography and Experiences of Solo Traveller*.

Gender In this survey the genders *Female*, *Male* and *Non-Binary* were represented, with female participants being in a slight majority. For this specific sample, the other options (*Transgender*, *Intersex*, *Prefer not to say* and *Other*) were not present and therefore omitted from the table.

Age group (years) The ages of the participants vary from 20 to 56 years old, with 60 % of the respondents being in their twenties. The average age is 31 years and the median age is 28 years. 3 respondents are 24 years old, which makes it the most occurring number.

Current location Germany is the most represented country in this sample, followed by the United States and the United Kingdom. The over-representation of Germany is likely due to a bias explained more in detail in section 4.3.3.

Options	Study Sample (N=20)	
	N	%
Student	6	30 %
Researcher	2	10 %
Research Assistant	1	5 %
Scientist	1	5 %
Product Manager	1	5 %
Marketing Manager	1	5 %
Marketing Executive	1	5 %
Programmer	1	5 %
IT Professional	1	5 %
Salesman	1	5 %
Architect	1	5 %
Mechanical Engineer	1	5 %
Early childhood educator	1	5 %
Flight Attendant	1	5 %

Table 4.2: Occupational insights of survey *Demography and Experiences of Solo Traveller.*

Completed education The options *Primary School* and *Secondary School* were omitted from this table due to lack of representation. The two respondents who selected the option *Other* have graduated with a *Juris Doctor* and a *Diploma degree.*

Amount of times travelled alone Most of the participants appear to be inexperienced with travelling alone, with 55 % having travelled alone between 1 and 3 times. The option *7–9 times* was omitted due to lack of representation.

Socialising Behaviour during Solo Travels

Table 4.3 addresses the socialising behaviour of the respondents during their solo travels. Contrary to the previous table, only the first inquiry was mandatory to answer, which is the reason for the varying sample size of the subsequent questions.

Subjective Well-being during Solo Travels

The survey showed multiple attitudes where the respondents appear to tend to their subjective well-being with three endeavours: introspection, enjoying solitude and socialising. Introspection itself is seen as a main motivator by multiple participants and according to them gained by using the opportunity during the solo travels to reflect, be serene and find oneself. This ties in with the idea that travelling alone can be a "transformative experience" from section 4.1. Similarly, solitude is perceived as another reason for journeying alone, where the time spend alone is enjoyed and feeling of contentedness can arise. In contrast to these aspects, the respondents also find socialising and meeting new people motivating and essential during their travels. They have

Question / Option	N	%
Do you like to meet new people while travelling?	Sample **(N=20)**	
Yes	11	55 %
No	4	20 %
It depends	5	25 %
How do you get to know people on your solo travels?	Sample **(N=18)**	
Hostel, hotel, accommodation	12	67 %
On the journey to the vacation destination	11	61 &
On the street	7	39 %
On public transport	3	17 %
Social media, forums, online platforms, etc.	2	11 %
Other	4	22 %
If you met people online - which platforms did you find them on?	Sample **(N=9)**	
Instagram	3	33 %
Meetup	1	11 %
Twitter	1	11 %
Dating Apps	1	11 %
Other	4	44 %

Table 4.3: Insights into socialising of survey *Demography and Experiences of Solo Traveller.*

shared several stories of their most memorable experience where they met and spent time with strangers or acquaintances; in one story, such a person is now one of the best friends of the participant, which is likely a rare case of a weak tie turning into a strong one.

As previously hinted at, there is no consensus regarding the socialising behaviour of the participants: some feel content in solitude and enjoy the peace and quiet, others want to meet people and actively seek out situations where they are forced to converse. This duality is explained by the participants with situation-dependent factors (organic setting for meeting people, size of the approaching group, mood of the person). What can be hypothesised out of this is that solo travellers want to have the freedom and flexibility to choose when they socialise and when not.

On the other hand, these positive contributors to subjective well-being are factors that counteract it. During solo travels they can feel lonely, bored or unsafe, get sick or lack in confidence. First, the participants mentioned the loneliness of not having someone to share their experiences with. One respondent mentioned feeling bored after some time travelling, which may be due to the absence of a conversation partner. Another participant shared how they missed a flight because of their phone battery draining and highlighted

how with a travel partner this situation could have been avoided. An important factor that was also repeatedly referred to is safety for themselves, their belongings and generally staying in safe areas. For a female participant, the most frustrating experience is when men keep following her, which diminishes her feeling of safety and security.

Staying in and breaking out of comfort zone

As perceived by the responses of the participants, they feel a need for personal growth and challenging oneself by exploring unfamiliar places, trying out new and different experiences, getting accustomed to unknown cultures, or forcing oneself to approach people. With this they break out of their comfort zone and relish in the desired thrill, fun and excitement. The activities the respondents describe are diverse: sightseeing in Barcelona, multi-day hikes in nature, partying in Chiang Mai, visiting the Louvre in Paris, or cycling around Ireland.

Curiously, it seems the participants still want to find a balance between those challenges and holding onto comfort and honouring familiar traditions and routines, e.g. attending mass in churches, during their travels. Another important factor which was mentioned by four respondents is safety - meaning staying safe and feeling safe. One participant mentioned that they stay in regular contact with their parents, and another acknowledged that they prefer careful planning beforehand. These examples can be perceived as techniques by which means solo travellers feel more safe during their holiday.

Consequently, similar to the subjective well-being of the respondents, they are also divided on their comfort zone. Some choose to bring themselves into situations that would be novel and unfamiliar, where they would escape their comfort zone, but, on the other hand, use everyday habits as means of stability. These phenomena were explicitly called out by one respondent saying: "having a good balance between challenging myself and being active, making decisions and so on and between resting and allowing myself to do normal everyday stuff like I would at home".

Thematic overlap

Regarding the three questions *What motivates you to travel alone?*, *What was most important to you the last time you travelled alone?* and *What was your most memorable experience on your first solo travel?* a notable and recurring aspect is how multiple individuals seem to mention various subjects. For one, it is the autonomy, planning freedom, time freedom, and choice independence the travellers have when they are travelling by themselves. Another point is their subjective well-being. The hypothesis is with those topics that this underpins the importance of independence and maintaining a sustainable subjective well-being for solo travellers.

4.3.3 Limitations

As mentioned above, the survey was published on multiple Reddit communities and survey exchange platforms. Due to this a *Coverage Error* [62] was introduced, which is probably the reason for the disproportional representation of certain origin countries, genders, occupations, and age ranges. Exemplary:

- A significant proportion of Reddit users are from the United States [63], which may be the reason for the large number of respondents from the United States.

- The fact that the survey sharing platform SurveyCircle is located in Germany may be the reason why there were so many respondents from that country [58].

- Students who need respondents for their papers, assignments, or theses are inclined to use survey exchange services. This could be the reason for the high proportion of respondents who are students.

With the decision to conduct a survey, there is no opportunity to inquire about ambiguities, which results in the loss of many nuances or participant rationale.

4.4 Personas

A persona is a made up person that represents the target market for a good or service, complete with a biography, goals, and needs. With this artefact, decisions regarding the user experience and future approaches can be made. Both non-participatory and participatory approaches are typically used to transmit information into a persona [64]. Three different personas are introduced in this part to represent the primary target group, the secondary target group, and the group that should not be targeted: a primary persona, a secondary persona, and an antipersona, who embodies the characteristics of the target audience but ultimately does not represent it [65]. The literature review and online survey are the primary data sources.

4.4.1 Primary Persona - Solo Traveller

Figure 4.1 introduces the primary persona of this thesis. The main data source for this persona are the findings and discussion of the online survey and the insights of the literature review introducing solo traveller. It should be noted that the demographic information, social media behaviour, motivations and frustrations are directly taken from these data points. The goals are formulated to serve motivation and combat frustration. The biography is a narrative spin of the information gathered from the aforementioned sources.

4.4.2 Secondary Persona - Digital Nomad

Figure 4.2 introduces the secondary persona of this thesis. The main data sources of this persona come from the takeaways of the literature review introducing digital nomads. Similarly to the primary persona, most information come from these data points, while the goals serve to be a concrete ambition of the motivations and frustrations, and the biography is a narration to underline the information from the data.

4.4.3 Antipersona - Business Traveller

Figure 4.3 introduces the antipersona [65] of this thesis. In contrast to the previous personas, the antipersona is created from a specific entry of the online survey who revealed to travel alone because of their occupation. This *nomadic worker* or *business traveller* fits the definition of the target group, since they have *travelled alone at least once*, yet do not do so for leisure and holiday, but for business and vocation. As in these cases the employer defines their time-frame and next location, the flexibility and independence usually associated with solo traveller and digital nomads is not present. This makes them the ideal antipersona.

4.5 Conclusion

A solo traveller is someone who wants to take a vacation and spend most of the time alone. They value having the freedom and flexibility to make decisions for themselves and whether to socialise. Difficulties include the social stigma associated with visiting restaurants, where they could be turned away or feel uncomfortable dining by themselves. For this reason, it is essential that this thesis is based on dinner outings. Usually, solo travellers are in their twenties to thirties, with a slightly higher proportion of female travellers.

The online survey resulted in deeper understanding regarding the demographics, travel behaviour, and perspectives of people who travel alone. Not only does the demography align with the literature review, but so does the need to maintain flexibility and independence. However, the wish to decide when to socialise and when to spend time alone also reinforces the duality that underlies socialising. The development of the primary persona required the literature review and online survey. The antipersona is the result of a specific entry from the online survey.

A worker who can do their job anywhere with just a computer and a functional internet connection is known as a digital nomad. Given the freedom, they can choose to work from anywhere. Like solo travellers, they value flexibility, but it comes with choosing their next destination and how long they want to stay there. As a result of this flexibility, they experience social isolation. They usually come from a privileged background and maximise those privileges in their choice of travel destination. The secondary persona was developed using the data gathered from the literature review.

SARAH SCHMIDT

GENDER
Female

AGE
29

LOCATION
Germany

PERSONA
Solo Traveller

SOCIAL MEDIA

Instagram   Twitter

Facebook

Biography

Graduated with a bachelors degree in political science Jessica found her true calling in her work as a Product Owner at a software company. She highly values autonomy, flexilibity and independence. Those attributes brought her into solo travel, where she already has five different destinations she visited by herself under her belt. Despite that, she wishes to connect with the people she encounters on her journey and even manages to stay with them in contact after the adventure concludes.

Motivations

- Autonomy during travels
- Avoiding feeling of solitude

Frustrations

- Declined feeling of safety because of men following her
- Being turned away for requesting a table for one

Goals

- Connect with fellow travellers
- Dinner in companionship

Figure 4.1: The Solo Traveller *Sarah Schmidt*. Image from Unsplash [66].

Biography

Being a self-taught software engineer Chris is known to be disciplined, organised and loving challenges. This is why his decision six months ago of leaving behind his home in the States and starting anew as a freelance frontend developer came to him quite easy. Nevertheless, he notices the downsides of this life he built with missing family and friends, "cabin-fever" and struggling to take care of his social wellbeing. So Chris isn't missing out on opportunities to connect with fellow nomads and traveller whom he can get to know and share knowledge with.

Motivations

- Autonomy over time and location
- Getting to know unfamiliar cultures

Frustrations

- Resulting "cabin-fever" from remote work
- Feelings of loneliness

Goals

- Meeting fellow digital nomads
- Introduction to local restaurants

CHRIS SMITH

GENDER
Male

AGE
27

LOCATION
Thailand (Current)
USA (Born)

PERSONA
Digital Nomad

SOCIAL MEDIA

Reddit   Instagram

Figure 4.2: The Digital Nomad *Chris Smith*. Image from Unsplash [67].

JOHN MILLER

GENDER
Male

AGE
47

LOCATION
UK

PERSONA
Anti-Persona
Business Traveller

SOCIAL MEDIA

Facebook

Biography

John always keeps saying that weekdays are for business and weekends are for family. This motto he upheld the past 16 years since he started his job as a sales representative at the company he's currently employed at. Most of his workdays are spent abroad with his meager freetime spent in his hotel room to replenish his batteries. He honestly can't remember the amount of countries and cities he has seen so far. While for his vacation he usually stays in all-inclusive hotels with his wife these days he still fondly remembers the one trip he did on his own: a biking trip 15 years ago.

Motivations

- Spending time with family

Frustrations

- Delays at airports
- Bureaucracy with frequent travels

Goals

- Going on family vacations
- Honoring his work-life balance

Figure 4.3: The Business Traveller *John Miller*. Image from Unsplash [68]

CHAPTER 5

Concept

5.1 Introduction

The section that follows defines and narrows the scope of the software artefact created for this thesis. To achieve this, the features are documented as use cases [69]. The use cases are based on the insights from the previous chapters, particularly chapter 3 which provided information about competitors and related work. Based on these, it was determined that the product should at least provide functionality for basic event management, specifically the ability to create, join, cancel participation in, and delete a group dinner. The use cases will serve as the foundation for subsequent chapters, where they will be refined and processed in order to be used in the usability study. Those use cases are visually presented with wireframes [70].

The format for the use cases was adapted and minimised from [69] to better fit the purpose of this thesis. A description, an actor, a precondition, a standard flow, possible alternative flows, and a postcondition are combined into one use case. These elements are defined as follows:

Actor Person who is currently interacting with the application

Precondition Everything that must be in place before the user can begin with the flow

Standard Flow Basic operating steps the user must take until they reach their goal and fulfil the description. Contains the trigger.

Alternative Flow Ways the user can divert while performing the standard flow

Postcondition How the application is changed after the standard flow is completed

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The main changes to [69] are the addition of the postcondition, where it is useful to know the state of the application after the standard flow was performed, and merging the "Trigger", which initiates the standard flow, to the standard flow itself.

Throughout the use case definition and subsequent chapters, the words group dinner, user, attendee, and host appear. These are their definitions:

Group Dinner An event created within the product where solo travellers and digital nomads meet to share knowledge and get to know peers. The event itself is a meal taking place in a restaurant or similar venues

User A role; someone who uses the product

Attendee A role; the role a person inhibits the moment they join a group dinner

Host A role; someone who manages and organises the group dinner

5.2 Use Cases

5.2.1 Create a Group Dinner

The first use case describes how the event host should organise a group dinner. Figure 5.1 illustrates this use case. Furthermore, they should be able to cancel the creation process at any time, as illustrated in Figure 5.2. As shown in Figure 5.3, applying filters should allow the host to see restaurants within the applied radius.

Description The host goes through the basic flow of creating a group dinner
Actor Host

Precondition

- App is launched and the actor is on the Home screen

- Location permission is given and current location is accessible

Standard Flow

1. Actor clicks on "Organise your own Group Dinner", which leads to a new screen

2. Actor has to select the restaurant they want to visit

3. Actor sees details of selected restaurant and confirms choice

4. Actor chooses date and time

5. Actor chooses the number of possible attendees of the group dinner

6. Actor can leave additional notes

7. Actor sees a summary of the group dinner and confirms it

8. Actor receives visual feedback on the successful group dinner creation

Postcondition

- The host is the first attendee of the created group dinner

- The successful group dinner creation appears on the Updates screen of the host

- The group dinner appears on the Home screen under the "Your group dinners" section for the host

- The group dinner appears on the Discover screen for other users

Alternative Flow 1 - Cancel Process

- Actor is on the screen for selecting the restaurant they want to visit (step 2)

- Actor clicks on the back button

- Actor is asked if they really want to cancel the process

- Actor confirms it

- Actor is returned to the Home screen

Alternative Flow 2 - Filter after Location for Restaurant Selection

- Actor is on the screen for selecting the restaurant they want to visit (step 2)

- Actor clicks on the search bar and searches for a restaurant

- Actor clicks on the location-filter

- Actor increases the radius to 100 km

- Actor sees a filtered list with fitting restaurants within the radius
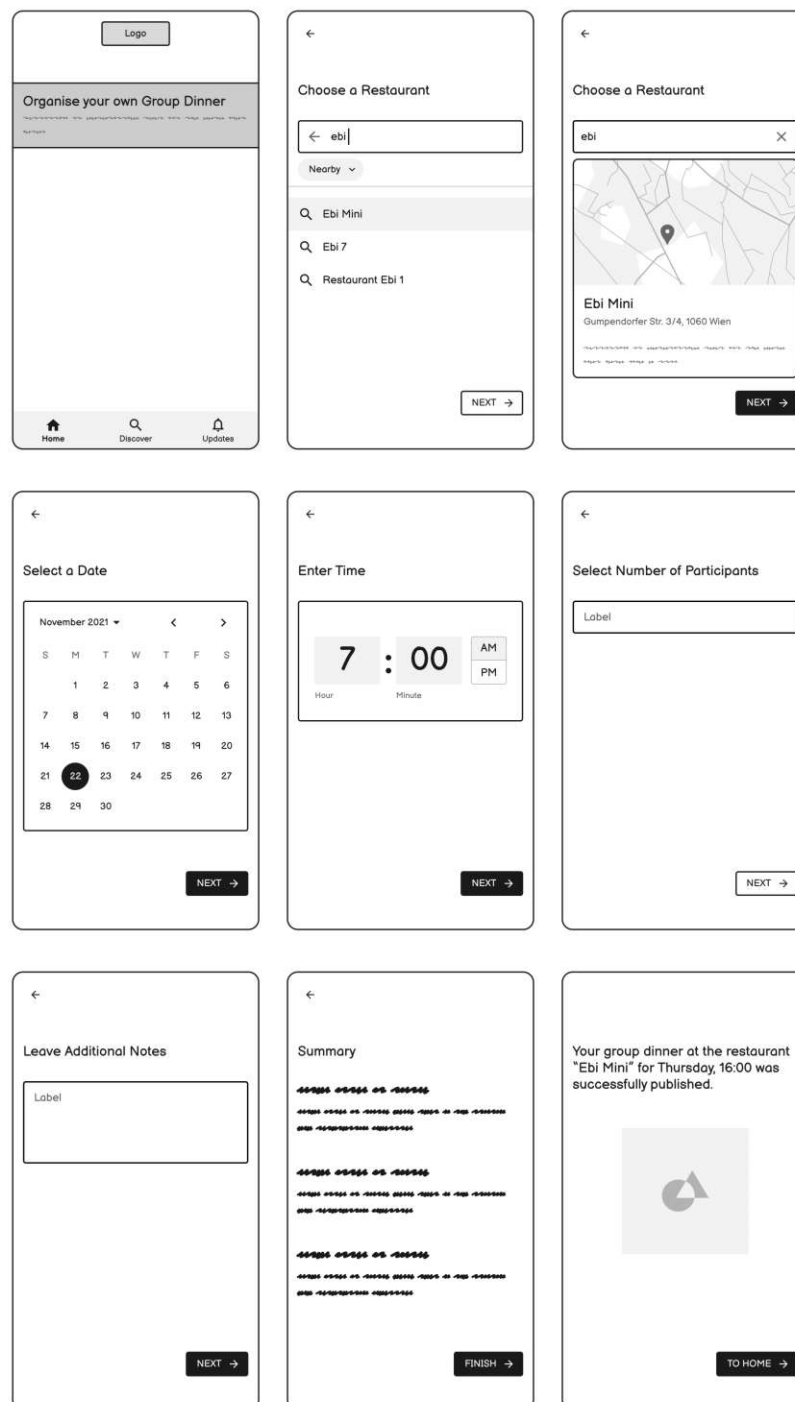
Figure 5.1: Standard flow of use case 1.
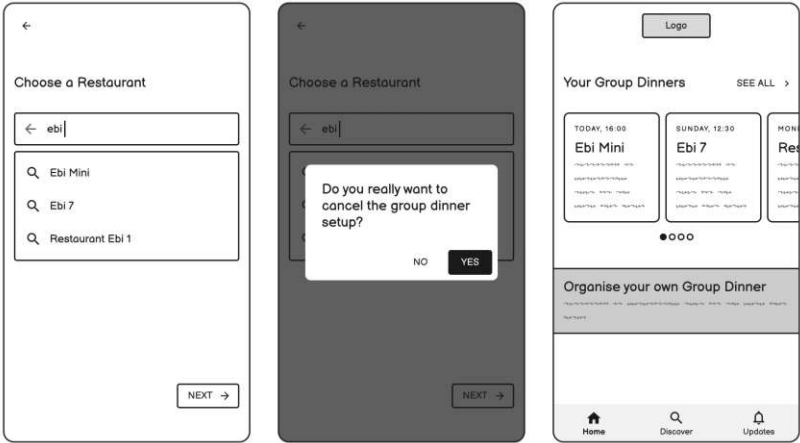
Figure 5.2: Alternative flow 1 of use case 1.
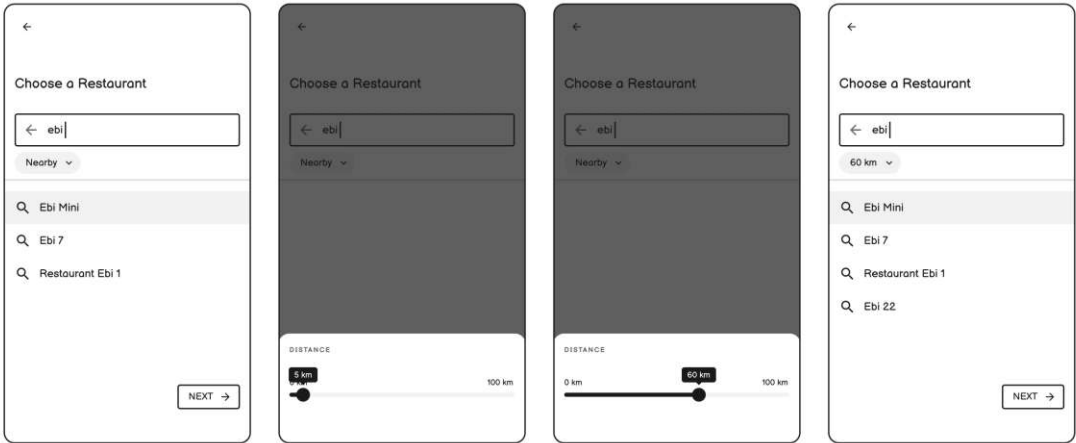
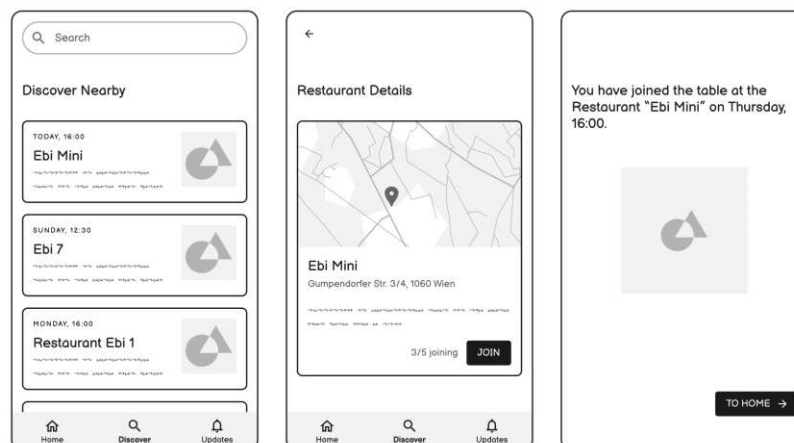Figure 5.3: Alternative flow 2 of use case 1.

Figure 5.4: Standard flow of use case 2.

5.2.2 Join a Group Dinner

Figure 5.4 illustrates how users can participate in created group dinners. The two discovered edge cases are when the group dinner is already full or when the user already participates in the group dinner. The second case is shown in Figure 5.5.

Description The user joins a created group dinner.
Actor User

Precondition

- App is launched and actor is on the Discover screen

- At least one future group dinner is in the application

- Location permission is given and current location is accessible

Standard Flow

1. Actor clicks on a group dinner

2. Actor sees details screen of the open group dinner

3. Actor clicks on "Join"

4. Actor sees confirmation message

Postcondition

- Joined attendee number is increased by one person

- The actor sees the group dinner in their in-app calendar

- Host is notified on the new addition

- Actor is notified on their participation

- Instead of the "Join" button the actor sees "Joined" for this specific group dinner

- The actor can still find this group dinner in their "Your Group Dinners" section on the Home screen

- The actor can still find this group dinner on the Discover screen.

Alternative Flow 1 - Group Dinner is full

- Attendee number is reached

- Group dinner is not browsable/discoverable anymore, so actor cannot find this specific group dinner

Alternative Flow 2 - User is already participating in the group dinner

- Actor sees details screen of the open group dinner (step 3)

- Instead of "Join" the user sees "Joined"

5.2.3 Cancel Existing Group Dinner

This use case describes how the host cancels the group dinner with the visual depiction in Figure 5.6. The two alternative flows describe the application's behaviour when the actor is an attendee rather than the host, as well as the behaviour of the mandatory field for providing a reason. The second alternative flow is shown in Figure 5.7.

Description The host is unable to attend this group dinner anymore and cancels the get-together
Actor Host

Precondition

- App is launched and actor is on the Home screen

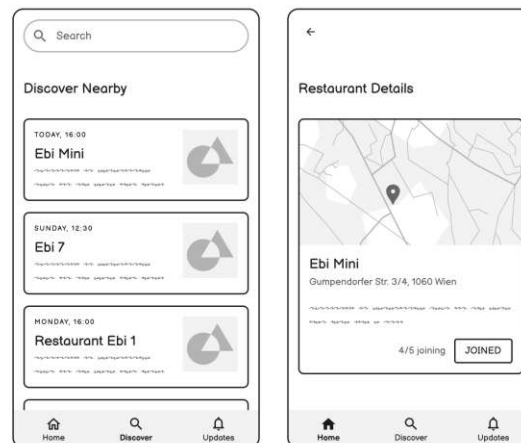- At least one future group dinner created by the actor is in the application

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Figure 5.5: Alternative flow 2 of use case 2.

Standard Flow

1. Actor clicks on the group dinner on the "Your Group Dinners" section

2. Actor clicks on the "Cancel" button

3. Actor is asked if they really want to cancel the group dinner

4. Actor is asked for a reason for the attendees

5. Application confirms the successful cancellation

Postcondition

- All attendees are notified of the cancellation with a push notification

- The same message appears on the Updates screen with the reason provided by the host/actor for the attendees

- The host receives an in-app notification on the cancellation on the Updates screen

- The group dinner does not appear on the "Your Group Dinners" section and the Discover screen for all attendees anymore

Alternative Flow 1 - Actor is attendee

- Actor clicks on the group dinner on the "Your Group Dinners" section (step 1)

- Actor does not see the "Delete" button as they are not the host of the get-together

Figure 5.6: Standard flow of use case 3.

Alternative Flow 2 - Actor is hesitant on providing a reason

- Actor is asked for a reason for the attendees (step 4)

- Actor tries to continue

- Actor is told they cannot continue without providing a reason

- Actor writes a reason and continues

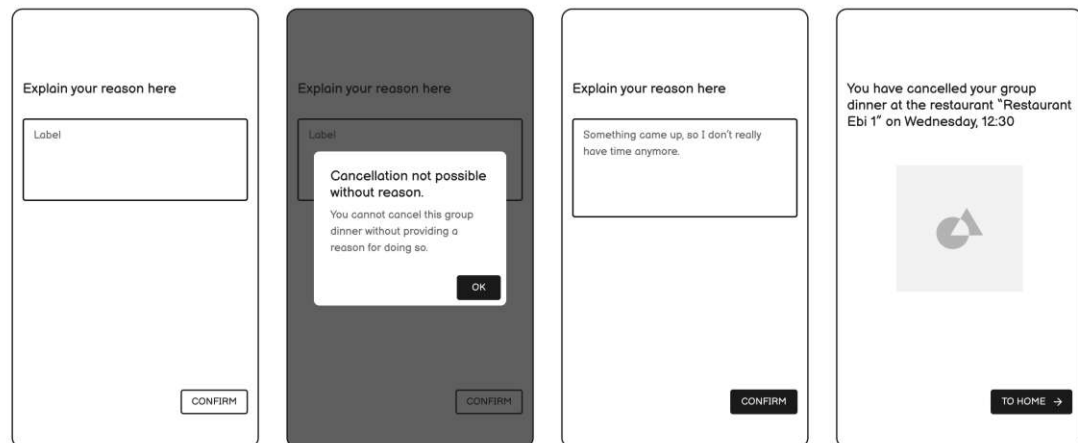- Application confirms the successful cancellation

Figure 5.7: Alternative flow 2 of use case 3.

5.2.4   Cancel Group Dinner Participation

The attendee wishes to cancel their participation in the group dinner, as shown in Figure 5.8. The alternative flows describe where the user can locate the group dinner in question.

Description The attendee cannot participate anymore and thus steps out of the get-together
Actor Attendee

Precondition

- App is launched and actor is on the Home screen

- Actor joined at least one group dinner in the future

Standard Flow

1. Actor clicks on the group dinner on the "Your Group Dinners" section

2. Actor sees the details page of the group dinner and clicks on "Joined"

3. Actor is asked if they really want to cancel their participation

4. Actor confirms choice
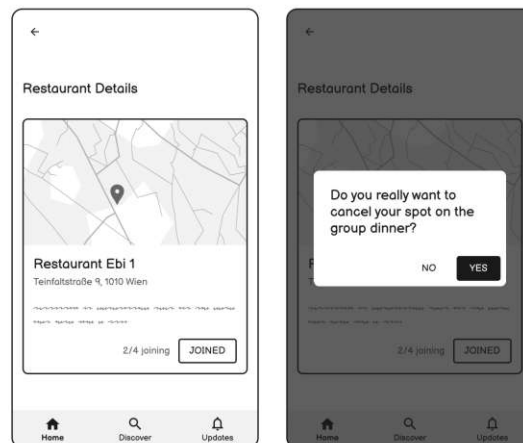
Figure 5.8: Standard flow of use case 4.

Postcondition

- Joined attendee number is decreased by one person

- The group dinners main button is now called "Join"

- Host is notified of the cancellation via in-app notification on the Updates screen

- Actor is informed on their decision via in-app notification on the Updates screen

- The group dinner does not appear on the "Your Group Dinners" section of the attendee anymore, but is still discoverable on the Discover screen

Alternative Flow 1 - Attendee finds group dinner on "Discover" screen

- Actor goes to Discover screen

- Actor scrolls until they find the specific group dinner

- Step 1–4 as described on standard flow follow up

Alternative Flow 2 - Attendee finds group dinner on the separate "Your Group Dinners" screen

- Actor clicks on "See all" next to "Your Group Dinners"

- Actor scrolls until they find the specific group dinner

- Step 1–4 as described on standard flow follow up

5.2.5 Find Past Group Dinners

This use case defines a flow for attendees to access their event history, also as seen on Figure 5.9. The alternative flows depict the various ways filters can be applied, such as by role, location, and date. The filters are visually shown in Figures 5.10, 5.11 and 5.12 respectively.

Description Attendee wants to find group dinners they have visited in the past
Actor Attendee

Precondition

- App is launched and actor is on the Home screen

- Actor joined at least one group dinner in the past

Standard Flow

1. Actor clicks on "See all" at the "Your Group Dinners" section

2. Actor filters after "Past" and "Joined"

3. Actor sees a list with the last group dinners they have attended in the past

Alternative Flow 1 - Actor wants to see group dinners they have hosted

- Actor clicks on "See all" at the "Your Group Dinners" section

- Actor sees all group dinners they have organised and participated in

- Actor filters after "Past" and "Hosted"

- Actor sees a list with the last group dinners they have hosted in the past

Alternative Flow 2 - Actor wants to find past group dinners of a specific location

- Actor clicks on "See all" at the "Your Group Dinners" section

- Actor sees all group dinners they have organised and participated in

- Actor filters after "Past", "Vienna" and "Joined"

- Actor sees a list with the filtered group dinners

Figure 5.9: Standard flow of use case 5.

Alternative Flow 3 - Actor wants to customize the date

- Actor clicks on "See all" at the "Your Group Dinners" section

- Actor sees all group dinners they have organised and participated in

- Actor clicks on the date filter and chooses "Custom Date"

- Actor selects a date
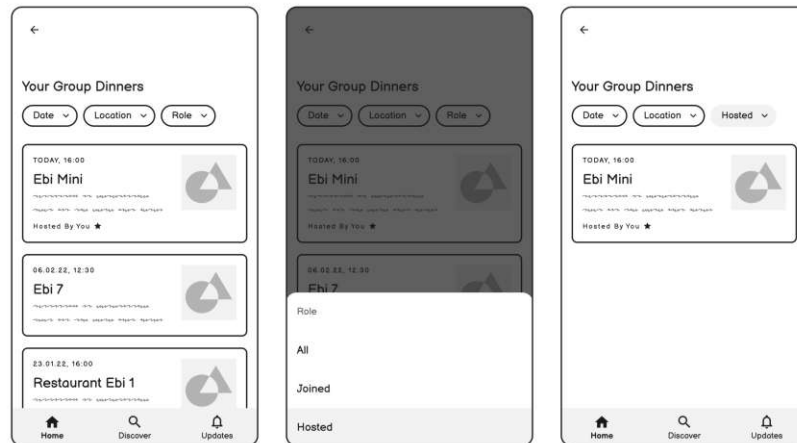
- Actor sees the filtered results of the selected date
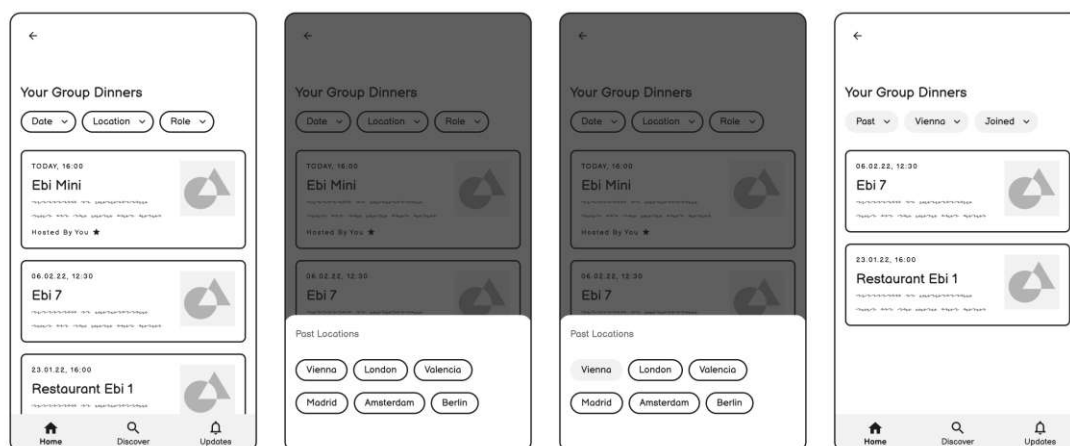
Figure 5.10: Alternative flow 1 of use case 5.
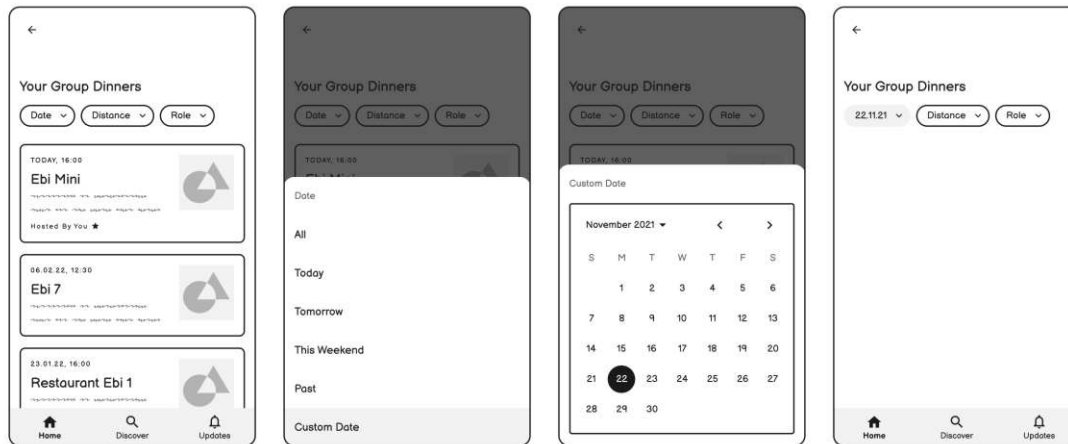

Figure 5.11: Alternative flow 2 of use case 5.

Figure 5.12: Alternative flow 3 of use case 5.

5.2.6 Find Group Dinner at Specific Time

The final use case defines the flow for users to use the search bar and select filters with the visual depiction shown at Figure 5.13. The alternative flows demonstrate what happens when users apply filters without first searching for a specific restaurant, as seen with Figure 5.14, or when they do not use the search and filter options at all.

Description Attendee wants to find a specific group dinner at a specific time
Actor Attendee

Precondition

- App is launched and attendee is on the Discover screen

- At least one future group dinner is in the application

- Location permission is given and current location is accessible

Standard Flow

1. Actor clicks on the search bar

2. Actor inputs "ebi" into the search bar

3. Actor sees all results

4. Actor chooses time and distance
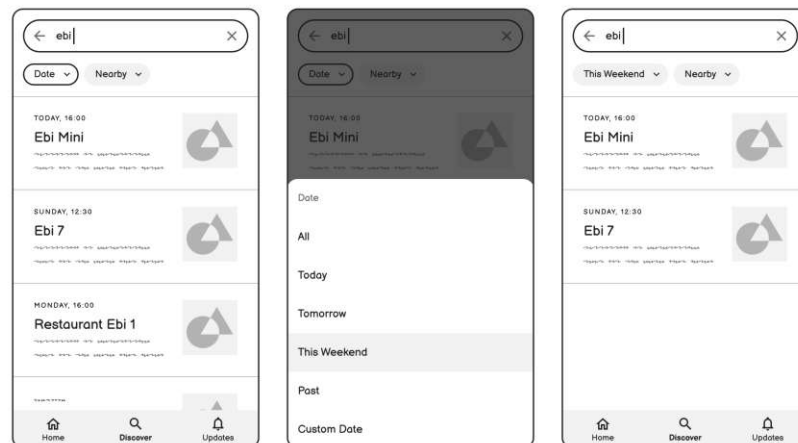
5. Actor sees filtered results

Figure 5.13: Standard flow of use case 6.

Alternative Flow 1 - Filters are applied without searching for a specific term

- Actor clicks on the search bar

- Actor filters after "This Weekend" and "Vienna"

- Actor sees a list with the group dinners that fit the filter criteria

- Actor clicks on one group dinner they are interested in

Alternative Flow 2 - No additional filters are applied

- Actor browses through the "Discover Nearby" group dinners

5.2.7 Receive Reminder on Upcoming Group Dinner

Description The attendee/host receives a reminder through a push-notification 12h before the event
Actor Attendee, host

Precondition

- Actor joined at least one group dinner in the future
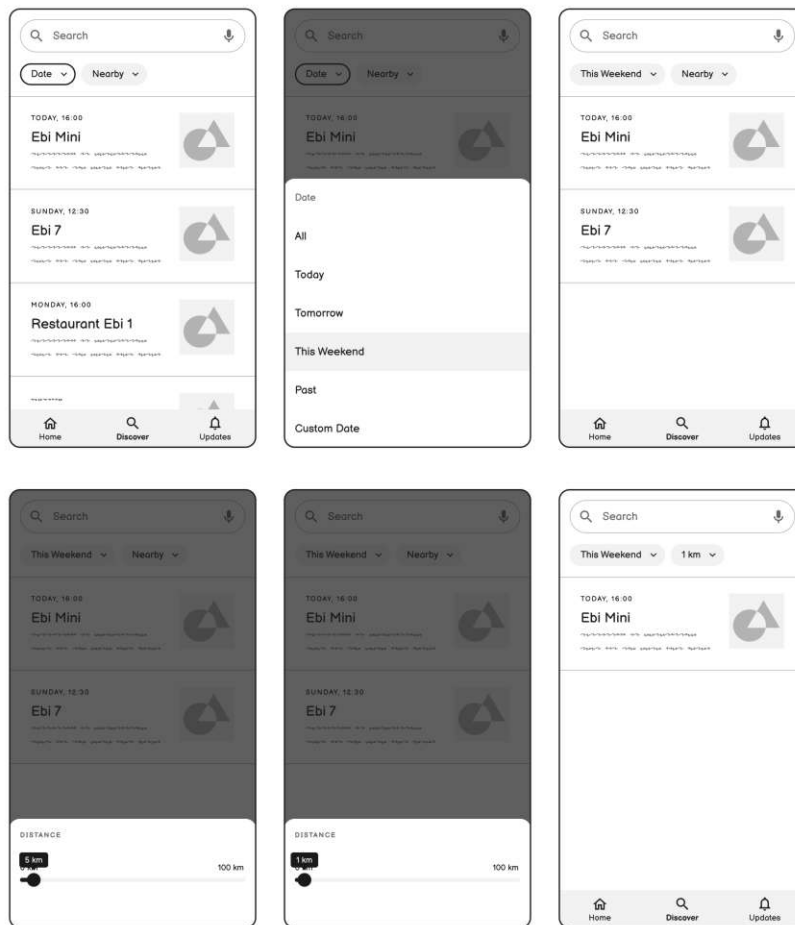
- It is 12h before the group dinner

Figure 5.14: Alternative flow 1 of use case 6.

Standard Flow

1. Actor receives a push notification reminding them on the upcoming group dinner

2. Actor clicks on the push notification, and it leads them to the detail page of the upcoming group dinner

Postcondition

- Badge next to the "Updates" on the bottom-navigation disappear once the message was read

Alternative Flow 1 - Actor sees reminder on Updates

- Actor did not click on the push notification of the reminder

- Actor launches the App

- Actor sees a badge next to the "Updates" at the bottom-navigation indicating there are unread notifications

- Actor goes to the Updates screen and sees the reminder of the upcoming group dinner

5.3   Mockups

The wireframes depicted in the previous section are given design elements like colouring and fonts to make them appear closer to the final design. This is done with the assumption that user testing may be more accurate with this decision, as it may feel more like using an implemented software application because of the familiarity of the elements and appearance. The wireframes are currently black and white and resemble sketches, which may lead to confusion. The font and colour choices were used consistently across the screens to adhere to the design principles discussed in chapter 3. The key screens are shown in Figure 5.15.

5.4   Conclusion

This chapter explains how to create a group dinner, join a group dinner, cancel a group dinner, cancel group dinner participation, look up past group dinners, search for group dinners with a filter, and get reminders about upcoming group dinners. This defines the basic features. Wireframes are used to create visual representations, which are then refined with mockups. These are the steps that needed to be taken to prepare the project for the upcoming study.
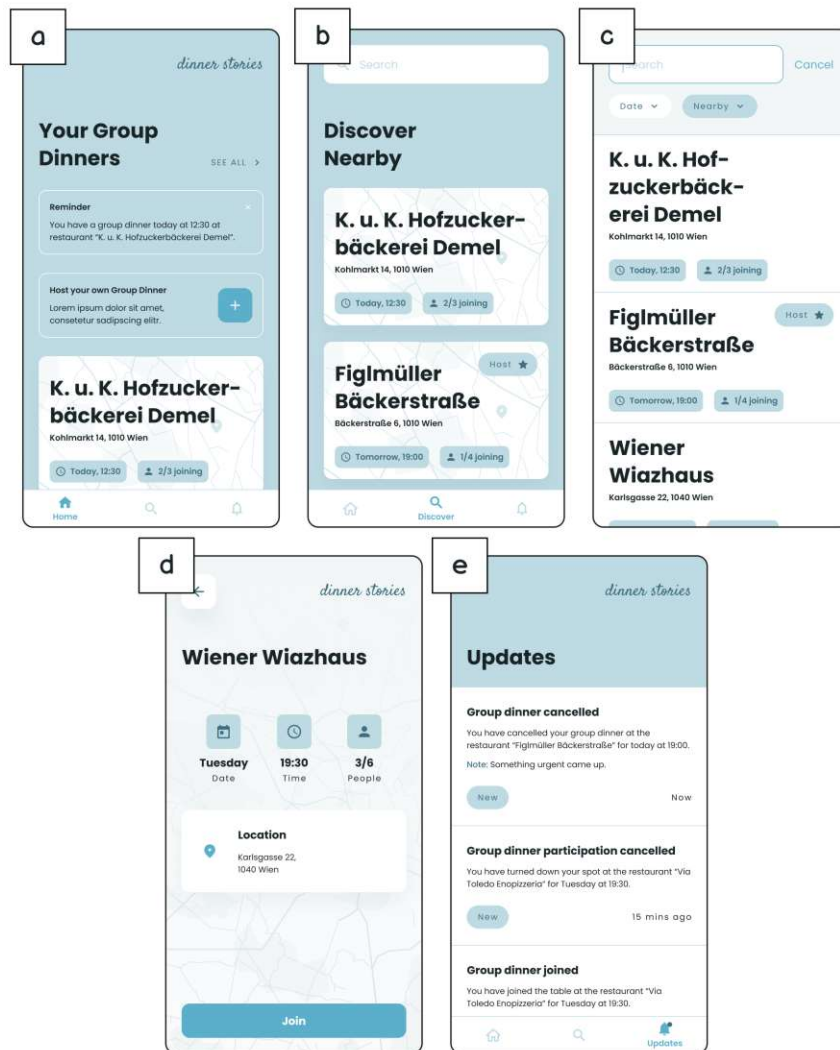
Figure 5.15: The mockups show key screens of *dinner stories*. (a) Home screen. (b) Discover screen. (c) Search component in Discover. (d) Detail page of group dinner. (e) Updates screen.

CHAPTER 6

Usability Study

6.1 Introduction

The usability study that acts as a proof-of-concept for the design and proposed features is introduced and examined in the part that follows. Due to the commitment of providing a product that is developed within the user-centred design framework, it is necessary for the defined target group to review the current state. Furthermore, in the previous artefacts, assumptions were made that need to be reviewed with people who would potentially benefit from the application. Therefore, the target group will review it and potential improvements are being explored.

6.2 Methodology

The following study is a lab usability test that was carried out remotely. The collection of qualitative and quantitative data was the main focus, and quantitative data received less attention. The qualitative data collecting allows for the gathering of user experience-related insights and problems. The only metric utilised to measure quantitative outcomes is task success. In addition to the usability test, a supporting user interview and the thinking-aloud technique [71] are performed to obtain more detailed information.

6.2.1 Procedure

The study was divided into three sections: a pre-test interview, the actual usability test, and a post-test interview. In a pre-test interview, information was acquired regarding the participant's socioeconomic background, travel experiences, and behaviour. For the usability test, the participant was given 9 scenarios to complete with the prototype. A high-fidelity click-prototype that sandboxed each situation was tested for the study. In other words, only the components necessary to resolve the scenarios were displayed

in the prototype, not the entire application. The click-prototype was made using the prototyping programme Figma [72]. The interview that followed the usability test was summarised, where the information will be used in section 7. The studies were audio and video-recorded. Transcripts of the pre- and post-test interviews were made and notes were collected during the usability test itself using the video as support. All the interviews were carried out remotely.

A remote pilot study was carried out prior to the main study. The purpose of the pilot study was to test the study's functionality, learn any ambiguities in the setup, the tasks, and questions, and inspect the prototype for errors. The aforementioned objects have been improved with the participants' suggestions and the researchers' insights.

6.2.2   Study Design

The use cases defined in the previous section 5 are expanded on in the following segment. As use cases describe the steps necessary to reach a goal in detail, they work little in a usability setting. This is the reason they are packed into a narrative where the goal the user wants to reach is put into the spotlight and a story is given to each of them. Therefore, participants must figure out which steps they have to take to reach that goal themselves, which makes those user stories and tasks better suited for the study. Those are task-based scenarios [73] and in addition to the tasks and stories, the time a participant should require to reach their goal is estimated as well.

For all scenarios, a pass and fail condition is defined beforehand. With this definition, the quantitative evaluation of task success is possible. The conditions are the same for all the scenarios, and worded vague enough for them to fit into each scenario. They are:

Pass Condition The user went into the correct flow and completed the task. Deviations are possible as long as the user can finish the task.

Fail Condition The user did not find the button to start the flow. The user went into the wrong flow. The user hit a dead-end. The end of the flow was only reached by the moderator giving a hint.

Scenario 1

Derived from: Use Case 4.1.1
User Story: As a user, I want to be able to create a dinner with several people, so I can visit a restaurant with a group.
Task: It is the 20th November and you want to try out the restaurant "Figlmüller Bäckerstraße" for the 21st November. Create an event for dining at that restaurant for that date at 19:00 for a group of 4 people and leave instructions where you want to meet up.
Duration: 2 mins

Scenario 2

Derived from: Use Case 4.1.6
User Story: As a user, I want to be able to browse existing events nearby.
Task: You have only arrived today in your holiday destination and want to try out local cuisine. Browse for existing events nearby without choosing one.
Duration: 1 min

Scenario 3

Derived from: Use Case 4.1.6
User Story: As a user, I want to be able to browse existing events nearby happening on the same day.
Task: You have only arrived today in Vienna and want to try out local cuisine. Browse for existing events nearby to have lunch.
Duration: 1 min

Scenario 4

Derived from: Use Case 4.1.2
User Story: As a user, I want to be able to join events.
Task: When browsing the app, you find an event at the restaurant "Wiener Wiazhaus" that matches with your availability. Join the event.
Duration: 1 min

Scenario 5

Derived from: Use Case 4.1.4
User Story: As a user, I want to be able to cancel my participation in joined events.
Task: You forgot you already have plans on Tuesday evening, where you would have gone to a group dinner. Cancel your participation in the event at the restaurant "Wiener Wiazhaus".
Duration: 1 min

Scenario 6

Derived from: Use Case 4.1.3
User Story: As a user, I want to be able to cancel future group dinners I host.
Task: You are the organizer of the group dinner at the restaurant "Figlmüller Bäckerstraße". You realise you cannot go there because of a conflicting appointment. You cancel the group dinner.
Duration: 1 min

Scenario 7

Derived from: Use Case 4.1.5
User Story: As a user, I want to apply certain filters to find the group dinners I have joined in the past.
Task: You have arrived in Vienna today. You are curious about the dinner outings you have visited in the past. Search for the events you have attended in the past.
Duration: 1 min

Scenario 8

Derived from: Use Case 4.1.4
User Story: As a user, I want to apply certain filters to find the group dinners I have hosted in the past.
Task: You are frequently organising events on *dinner stories*. You are curious how many you have hosted in the past. Search for those events.
Duration: 1 min

Scenario 9

Derived from: Use Case 4.1.7
User Story: As a user, I want to have an overview on all the updates.
Task: You want to read up on your latest Notifications.
Duration: 1 min

6.2.3   Analysis

Qualitative data collected from the usability study through tasks, scenarios, and user interviews were analysed using several thematic analysis techniques. Informal thematic analysis was used to generate the themes as they were being heard during the video-recording of the task executions. Deductive thematic analysis was applied to the post-study user interview [56]. Task success is quantitatively measured in line with the pass condition.

6.2.4   Participants

Three people who closely resembled *Solo Traveller Sarah Schmidt* were selected for the usability study. Between the ages of 23 and 27, the participants, who are presently based in Vienna (Austria), Valparaíso (Chile), and New York City (USA), are employed as student, software engineer, and university assistant. The participants were recruited from my personal network. In the following sections they will be referred to as Participant 1, Participant 2 and Participant 3, which respectively corresponds to their involvement in Test 1, Test 2 and Test 3.

Table 6.1: Quantitative Results of Usability Study

	Pilot Test	Test 1	Test 2	Test 3	Average
Time in mins	32:53	56:26	28:03	34:58	38:05
Task 1	Y	Y	Y	Y	100 %
Task 2	N	Y	Y	Y	75 %
Task 3	Y	Y	Y	Y	100 %
Task 4	Y	Y	Y	Y	100 %
Task 5	Y	Y	Y	Y	100 %
Task 6	Y	Y	Y	Y	100 %
Task 7	N	N	Y	N	25 %
Task 8	Y	Y	Y	N	75 %
Task 9	Y	Y	Y	Y	100 %

6.3 Findings

In this section, the findings of the usability study are presented. What is written here is the summarisation and key findings of the video- and audio-recording of the three participants and the observations of the researcher. The qualitative results originate mainly from the interview that took place after the study.

6.3.1 Task Success

In Table 6.1 the quantitatively evaluated data sets are presented. The data sets include the pilot test and the three usability tests with the participants. It shows that the average time an interview took was around 38 minutes, with the quickest one being done in 28 minutes and the longest one taking around 56 minutes. Six scenarios were completed according to the pass criteria, while in 4 cases at least in one round the scenario led to the fail condition. The solving of scenarios 2, 4, 5, 6 and 9 were done fast and straightforward. Noticeable is scenario 7, where the necessary filters need to be applied to find group dinners that were joined in the past, which led to the fail path in 3 out of 4 rounds.

6.3.2 User Experience of Application Design

The following section summarises and groups the participant remarks from the applications' user experience into paragraphs. In general, the app's features were found to be straightforward, intuitive, and self-explanatory, allowing the participants to quickly and easily locate anything they needed. They also highlighted the appealing visual design. However, it appeared that some participants were unfamiliar with the capabilities and limitations of click-prototypes in Figma. For example, they tried to use their physical keyboard to enter letters into the prototype.

Home Screen

Participants 1 and 3 both noted that certain elements of the Home screen are clear and easy to grasp. Even though it was not the main problem they were working on, Participant 3 pointed out that they like that the upcoming reservations are directly visible on launch of the app. In addition, one participant brought up that this section, which is a horizontal scroll, might encounter problems if the user joins a lot of events and wants to find a specific group dinner. They proposed a solution by introducing a fourth element in the bottom navigation that would lead to a separate screen showing all the joined events. Another participant attempted to navigate to the next item by clicking on the dots beneath the cards, but this did not function; it was not the intended function for that visual cue. Participant 1 also mentioned that for them, clicking on "Host your own Group Dinner" will directly lead to the creation of a new group dinner. This is quite different from Participant 2, who attempted to use the Discover functionality, which they have not yet been introduced to, by clicking on the magnifier icon located on the bottom navigation bar in order to initiate the creation of a new group dinner. The mentioned points in this paragraph refer to the screen in Figure 5.15(a).

Relocating some of the functionality from the Discover screen to the Home screen would be an improvement, according to Participant 2. The prioritisation could mean arranging the joined group dinners first, but in case no group dinners have been joined yet, group dinners nearby would be displayed in place of the empty state. This suggestion is similar to Meetup, where, instead of the joined events, users see an empty state, encouraging further exploration [13].

Group Dinner Management

Both positive and negative aspects of group meal management were brought to attention, including its creation and cancellation. Participant 3 noted that it was convenient to have the option to include optional notes when organising an event. However, they also noted that it seems odd that the cards that allow the user to select the group size are not all the same size. After finishing the process of creating a group dinner, Participant 1 expressed that, in their opinion, there was still something missing, such as a screen confirming that the user intents to create this event. Two participants in particular brought attention to the event's cancellation, pointing out that other participants might still get together and go to the restaurant without the host, and wondered whether it would be possible to transfer the hosting rights. On the other hand, Participant 2 noted that both the cancellation of the event and the cancellation of participation were really simple and uncomplicated.

Discover Screen

There were a few misunderstandings about how the magnifier icon of the bottom navigation, which opened the Discover screen, was interpreted. In scenario 2, users should search for the available group dinners nearby. Participant 1 initially focused on the events that were displayed on the Home screen, that represent the joined events, as seen in Figure 5.15(a), and only by coincidence found the Discover functionality. When asked why they would have gone that route, they explained that the magnifier icon for them represented a dedicated screen to browse for restaurants for inspiration, rather than specifically looking for pre-made group dinners. One participant suggested writing "Discover" under the bottom navigation's magnifier icon as a solution to that problem. Currently, the title "Discover" only shows up when the Discover screen is active and visible.

Additionally, the same person suggested using a visual cue to indicate which group dinners on the Discover screen visualised in Figure 5.15(b) the user has already joined. The ability to choose restaurants immediately from the "Discover Nearby" section and throughout the search, together with other details like the address, was mentioned as a plus. Participant 2 pointed out that it would be unclear to describe group dinners in close range by using the word "nearby". They presented edge cases, such as people who sit on an airplane or turn off their live location. They suggested just writing the nearest city, Vienna, for example, along with an indicator to show that the location is accurate and has been updated recently. For the search in Figure 5.15(c), they have expressed appreciation for the filters, noting that it provided users with just the information (time and location) they needed.

Group Dinner History

Similar feedback was directed at the group dinner history, which is accessible through the "See All" button on the Home screen in Figure 5.15(a), but whose purpose was not immediately apparent to a participant. This was reported by the individual who, after exhausting all other options, finally clicked on "See All". In contrast, another participant accessed the history by simply clicking "See All".

Updates

One participant commented on how they thought the "New" tag on the Updates screen in Figure 5.15(e) made sense as a visual indicator for unread notifications. However, one person objected to the tag's visual design because it was too similar to a button.

6.3.3 Branding

To one participant, the naming of "group dinner" for the events that can be created and joined felt confusing, as dinner usually insinuates being an event taking place at a later time and not for lunch or breakfast. They suggested naming it "group meal" instead or

explicitly writing whether it is AM or PM to make the time clearer and avoid cultural misunderstandings (e.g. Spanish people have dinner at 9-10 pm but in other cultures 9-10 am is a viable time to have breakfast together).

6.3.4 Participant Suggestions for New Features

Integration of 3rd Party Apps

There were several places during the usability study where Participant 1 desired the integration of third-party applications. They mentioned that having reminders outside of the application itself that can useful and named as examples syncing the appointments with a calendar application or receiving push notifications shortly before the start of the event. On another note, they wished for the possibility to deep link to a map application, where they would immediately receive directions to the location. But also they wanted to have deep linking to a map application so they easily can read up more information on the location, which would be important for people to read up whether the place would accommodate their diet (e.g. vegetarians, gluten-free, etc.).

Information

A participant expressed for the application to include more extra information. They specifically want attention to be paid to what is and is not included in the app. Some users might not be aware that this application only handles the group finding process and that they still need to take care of the restaurant reservation. Additionally, they would like recommendations to be included for particular restaurants; these could come from the app itself or be linked to the relevant source.

Group Dinner Management

Two participants objected to the fact that the host of a group dinner could cancel it without transferring hosting rights, which would prevent the other participants from meeting and having a meal together regardless of the host's availability. A penalty for cancelling too many group dinners could be implemented to discourage hosts from doing so. One participant clarified this by comparing it to the way online chess penalties work, where players who repeatedly cancel games receive penalties. Furthermore, Participant 1 lacked the possibility to write on the group dinner's message board or get in touch with other attendees. They addressed their request with examples, such as being able to let participants know that they might show up a few minutes later or that they might want to exchange contact information with other attendees after an enjoyable in-person dinner outing.

Profile

Participant 1 wanted to view fuller profiles related to the app for a number of reasons. As previously stated in the previous part, users might want to be able to get in touch with participants of the event they had a nice evening together with but failed to provide contact information at the event itself. For them, the already suggested message board may be improved with the option of getting in touch with an individual directly. On a minor note, one participant recommended adding spoken languages to the profile. People may want to check if someone speaks the same language as them to practise when they scroll through the attendees of a group dinner.

Updates

On the Updates screen, Participant 1 lacked opportunities for interaction. They stated that they would not need many more features for the screen to function as it does now, but they would like to be able to mark notifications as read or delete them.

6.3.5 Trust and Safety

The lack of moderation of *dinner stories* was the primary worry raised by Participant 3. They worry that this could enhance the likelihood of abuse occurring because they do not know who joins the restaurant outing until they actually meet them. They express their desire to have access to additional participant data, such as a brief biography or a photo of them. They also suggested a system based on verification. This entails verifying one's own profile or making options available that allow users to confirm the credibility of other participants; these reviews might be accessible to everyone viewing the details of a dinner outing.

They cited previous versions of the carpooling app *BlaBlaCar* [74]. BlaBlaCar have used a verification system, in which users who failed to show up on schedule or behaved inappropriately could face penalties and even expulsion from the application. Couchsurfing makes use of a similar system. Participant 3 acknowledged that rating systems could be problematic (people with few reviews also have fewer chances), but they felt more comfortable using the app if one was present in the end.

In relation to safety, Participant 3 further stated that before using the app in new places, they would first try it out in cities they felt safe in and could communicate in the native language of the country. Subsequently, they would begin to use it in locations to make them feel safer, such as when they would explore a new city and would feel safer walking in a group.

6.4   Limitations

Several arguments point to the need for further research. First and foremost, the insights gained from this usability study are limited due to the small sample size. Perhaps another usability study with a larger sample size is needed. Another reason for doing follow-up research is to address the raised questions concerning trust and safety. Finally, the under-representation of digital nomads is another setback. Only participants in this study with previous solo travel experience could have their observations taken into into account. As a result, the experiences and insights of digital nomads could not be considered.

6.5   Conclusion

A high-fidelity click prototype was made using the insights collected from the previous artefacts, and it served as the basis for the usability study that was conducted. Three solo travellers participated. The duration lasted from 28 to 56 minutes, and six of the 9 scenarios were completed to the full satisfaction of all participants. The participants want more details about the application, both what it can and cannot do, and about the users personally. In light of this, creating and maintaining a profile is viewed as vital, particularly since it could increase feelings of security and offer a way to stay in touch. The discoverability and findability of the design appeared to be low in some places, particularly on the Discover screen or when searching for the complete list of the past group dinners. The participants provided detailed improvement suggestions that may be worth considering in the future, especially for future research. Also given the small sample size and the under-representation of digital nomads, more research is required.

CHAPTER 7

Discussion

The following section evaluates the thesis as a whole based on the effectiveness of the techniques and methodologies, where and why the methodologies were used, the extent to which the research questions are addressed, and any potential limitations and alternative approaches. The research questions are also given their own focus point, which summarises the main points to answer the question and mentions the thoroughness and quality of the answers.

7.1 Answering the Research Questions

7.1.1 R1: How can an event-based social network support in forming weak ties for frequent travellers?

It appears that both digital nomads and solo travellers frequently lack the natural environments where people meet, and as a result require additional support systems. This is supported by the frequent remarks of "cabin fever" [47, p. 6] and, as detected in 4.3 feeling lonely. The popularity of platforms like Couchsurfing or Meetup, which also include event management features, support this. Additionally, it must be considered that because solo travellers and digital nomads frequently move their locations, developing strong ties is highly unlikely. This is not a drawback because having weak ties, or acquaintances, is a necessary component of having a satisfying social circle. In fact, close friends and family make up the minority of one's social circle, while acquaintances make up the majority [1], [2].

The option to maintain contact with met people over a dinner outing planned through *dinner stories* was something that one participant during the usability study lacked. This is basically one of the fundamental prerequisites for an SNS, along with having a profile, the ability for users to maintain a network within the app, and content browsing

[9], [10], [11]. The only way to browse the content in *dinner stories* is through event exploration. This is a result of the early decision to design an anonymous platform, although it might be revisited in follow-up studies, especially with the inputs of the usability study participants. If the changes are included, the application will meet the basic requirements of an SNS.

This research question was addressed in the literature review, online survey, usability study, competitor analysis, and related work, the latter two of which revealed numerous existing SNS and how they solve the topic of forming weak ties through technical means. The usability study showed potential adaptations to allow users to stay connected over time. With these changes, the software may be more useful to travellers. Therefore, this question was well answered.

7.1.2 R2: What benefits derive on the focus on restaurant outings?

Based on the results of the literature review, solo travellers are hesitant to eat somewhere else, especially during dinner, because they believe it to be socially stigmatising to engage in certain activities alone [44]. However, on the other side, are experiences shared of restaurants turning people away dining alone as they probably favour groups or couples [40], [41], [42]. This means that in addition to internal variables, the issue also depends on outside variables.

People who frequently change locations, such as solo travellers and digital nomads, often miss having people to talk to and suffer from social isolation. According to students who live abroad, having a fulfilling subjective well-being causes them to be less stressed [1]. It should be noted that in my research, no investigation has been conducted to determine whether this connection exists for solo travellers or digital nomads as well.

With these insights, it was a logical choice to look for a solution that allows solo travellers to get to know restaurants in foreign places with like-minded people. Perhaps the industry will adapt to these changes at some point, especially with the perceived rise of digital nomadism and solo travel in recent years, but until then, software like that could bridge the gap.

The answer to this question was not given its own section, chapter, or methodology. It received less priority and was addressed using insights from a literature review of digital nomads, solo travellers and subjective well-being. What would have been intriguing to include is a review of the literature on the social aspects of having meals in companionship. However, numerous benefits were discovered that highlight the importance of focusing on dinner outings, so it was satisfactorily answered.

7.1.3 R3: How can design support in the findability and discoverability of available events?

On a broader level, it appears from the related work in section 3.2 that providing consistent and clear design and adhering to widely accepted design patterns that users are familiar with and have interacted with multiple times benefits them. As a result, standard patterns are used, with special emphasis placed on the patterns used by Android [23] and Apple [24]. All the features are precisely defined so that there is an exact boundary, and wireframes and mockups are supplied to back the prototype design phase.

Based on the the definitions of Aurora Harley [25] it appears that the design patterns that support findability are search, filter, sort and navigation. Discoverability, on the other hand, corresponds to the design patterns providing hints, tips and prioritising the features in a logical manner.

The competitor analysis of section 3.3 provides detailed information on where and why design patterns for findability and discoverability are used. The placement and use of the patterns for the prototype were analysed using these. Significant decisions because of these insights lie in the design of the Home screen to display upcoming events horizontally and providing a separate screen to browse all existing events in an infinite vertical scroll. Furthermore, the bottom navigation is used for findability and provides easy access to the Discover screen.

All the scenarios involve in findability or discoverability. Exemplarily, they are led to find a specific item, such as cancelling their participation in an event, as described in scenario 5. This is an ideal example for findability, because the user is aware that they have already registered for this event.

For findability and discoverability, it is critical to have a clear understanding of the application and its components, as well as where the interactable components lead. This was not successfully realised for the Discover functionality, where the purpose was not obvious at first glance. Similarly, one participant did not discover the history of the group dinner until they had exhausted all other options.

On a positive note, other functionality was immediately grasped, such as the Updates screen, which was opened by all participants; multiple reasons lead to speculation as to why this is so, one being that it was designed and placed in a location that follows standard practices, or another being that it was the last scenario performed by the participants, meaning they were already familiar with the usage of the prototype.

This research question received the most attention. Several methodologies partially answered it, and previous hypotheses were tested in the usability study. However, it appears that there are still unanswered questions. Especially since the participants themselves made numerous suggestions for improvements and certain features appear to need to be revisited. This indicates the possibility of further research.

7.1.4 R4: What minimum and maximum number of participants are practicable for an event?

Due to their small size, the requirement to be in the same location at the same time and shared characteristics, the groups in this product are social groups [5]. Only a limited number of people can participate in a dinner outing considering conversation dynamics. When there are too many people present, more would observe the conversation rather than actively engage [6]. Restaurants only having a certain number of seats available, which has not yet been acknowledged in the thesis, also serve to reinforce this. 2–6 people, including the event host, can join. The lower number was in dispute because it raises the issue of whether two people can already be considered a group [5]. The literature review was used to determine the upper limit, where six people emerged as the ideal number for a group activity.

This question, as previously mentioned, does not acknowledge that one restriction is the limited seating in restaurants. Both the overall number of seats that are available in a restaurant and the number of seats that can be placed at a table are affected by this. There are several ways this could have been approached, including using online research to see the lower and upper number on restaurant reservation platforms, literature reviews to find articles that have already investigated this, and ethnography to look at table arrangements in nearby restaurants. Given the upper limit of six people, finding a seat in most restaurants should be easy.

Including two-person outings was positively highlighted by one participant in the usability study. It could also help people who have trouble interacting in larger groups, as it makes it easier for them to form weak ties that way. Regarding the higher number of participants, no feedback was provided. The answer to this research question had a minor impact on the application design, specifically on the participant number for an event.

The least thought was given to this question's response, which was primarily impacted by the literature review's findings. However, it was well answered.

7.2 Effectiveness of Methodologies

7.2.1 Literature Review

With the literature review, the questions R1, R2, R3 and R4 could be partly or completely answered. The methodology was used throughout the chapters 2, 3 and 4. Therefore, the influence that the literature review had on the outcome of this thesis and its insights is significant and was crucial to include as a methodology.

Chapter 2 consists only of a literature review. In subsequent chapters, it was used to introduce the topic, and the follow-up methodologies used this knowledge as a basis. For example, the literature review introduced the solo traveller, while the online survey went into greater detail. Furthermore, the validity of the methods can be proven using this approach.

Chapter 3 used literature review at two points. First, the topic of social networking services is introduced and second for the related work. The related work provided an intriguing insight into similar existing topics, but only influenced the subsequent design decisions to a minor extent. Although the decision to conduct a related work is not disputed, a different focus might have yielded more meaningful results.

The majority of the sources for the literature review are peer-reviewed journals and academic books. The main emphasis was on sources from recent years, with a few exceptions; for example, Granovetter's [2] research was included despite being older because it was cited in the majority of papers with similar research and thus pioneers in the field of social capital. The data are considered reliable because similar, if not identical, results were gathered when a different methodology was used on the same topic.

The lack of research on the social aspects of eating in company is one of the limitations of the review. The loneliness faced by solo travellers and digital nomads is mentioned in the artefacts, along with the perceived social stigma of eating alone and possible rejections by restaurant staff. However, there may be historic reasons why humans chose to spend time in company to eat together and why cuisine may be important for travellers in foreign countries. These elements are missing and could have provided a better foundation for the decision to focus on restaurant outings.

Certain aspects of this thesis required a literature review. However, the theories introduced in the field of social psychology, such as social capital, subjective well-being and group dynamics, may have benefited from expert interviews as well. However, the decision against conducting expert interviews was influenced by the asynchronous nature of the literature review and the broader generalisation possible through this method.

7.2.2   Competitor Analysis

With the competitor analysis, the research questions R1 and R3 received their focus and were addressed. It was part of chapter 3 and in combination with the related work defined the necessary features and design decisions for the follow-up artefacts. Especially the influence of the gathered data on the wireframes and the prototype, but also on answering R3, is palpable.

The drawbacks of this thesis' competitor analysis originate from the fact that at least one of the products examined is not aimed at solo travellers or digital nomads. This could be one of the reasons why Hey! VINA had little influence on the subsequent artefacts' decisions.

Meetup introduced a feature called "Meetup Connections" that allows participants of the same event to stay connected, allowing users to create and grow networks within the Meetup app [75]. Users had to exchange contacts outside of the application prior to this feature [13]. Because this new feature was released after the competitor analysis and usability study were completed and analysed, certain argumentation points made in previous sections are possibly obsolete.

At the beginning of the competitor analysis, the decision was evaluated whether it would yield more meaningful results to do a shallow analysis of a large amount of competitors or do a deeper examination into a select number of competitors. In the end, the decision was made by performing a thorough examination. The competitor research was the first step taken in the thesis, with the analysis conducted at a later point, which means that the moment the analysis of the competitors took place, some of them were not available anymore. The research into Hey! VINA influenced the outcome of the thesis the least, perhaps a different competitor might have produced more significant outcomes.

7.2.3   Online Survey

The online survey helped to address the research questions R1 and R2. However, the answering of the research questions was not the focus of this methodology, it was to get to know the potential target group better and to gather data for persona creation. This goal was achieved as the mix of quantitative and qualitative data collection of the survey enabled a thorough examination of solo traveller, their demographic, challenges, and motivation.

One of the bigger obstacles was recruitment, as many places on Reddit explicitly block survey recruitment posts. In the case of recruiting digital nomads and solo travellers, the subreddits with the largest number of followers explicitly blocked those or explicitly asked them to refrain from posting these things. The participants were recruited from

pages for survey exchanges and poll sampling. Consequently, the recruitment was not well targeted. But after those challenges were resolved, the quantity and quality of the data collected were both extremely positive.

What was completely missing was data collection from digital nomads. It was decided to deviate from the original plan, which included a separate poll targeted towards digital nomads, as no responses could be collected. This could be investigated further, including experts supporting with the recruitment and using their knowledge to suggest new ways and places to find participants. With this perhaps the secondary persona could be refined.

A diary study could have been another appealing qualitative method for gathering feedback on the stakeholders' challenges and motivations. This thesis would have been influenced by a very recent experience in a diary study, rather than an online survey, in which some people recited memories from years or decades ago, with their stories influenced by potential bias and lost details. Yet, the data accumulated by the online survey is assumed to be accurate as it aligns with the insights from the literature review. What spoke against diary studies is the feasibility and timing of conducting such an experiment given the need to recruit solo travellers or digital nomads before they go travelling, as well as recruitment itself, which was already a limitation when conducted online.

7.2.4 Persona and Antipersona

The persona itself is not addressing explicit research questions, but is seen as a summarisation of parts of the literature review and the online survey. Therefore, it only indirectly addresses the research questions themselves, especially R1 and R2. As an example, the primary persona does not like to be turned away at tables at restaurants, which can be seen as a benefit for R2, but only because it already was addressed in the online survey and literature review.

The reliability and validity of the created personas and antipersona can be assessed from two perspectives: first, the reliability and validity of the source data and second, the reliability and validity of the created personas themselves. The reliability and validity of the created personas are addressed here, as the source data is evaluated in their respective subsections.

The information for the primary persona is deemed accurate and reliable. This is due to the fact that the persona is based on the online survey and literature review, with the insights overlapping and thus proving to be accurate. However, the data for the secondary persona is not considered to be as accurate because it is derived solely from the literature review. To support the findings, another method would have been required. This was not done due to the limitations mentioned above. The antipersona is based

on a certain response from the online survey. This is the least trustworthy of the three personas mentioned. This is due to the fact that it is impossible to determine whether that person entered valid information.

Biases from the previous methodologies, namely the online survey and the literature review, are carried over to this methodology. Taking as an example the location of the primary persona: It is hypothesised that Germany is over-represented in the online survey, because the survey exchange platforms are from Germany. This bias was carried over to the persona and originated from the online survey.

From an ethical standpoint, it is questionable whether including information from one online survey response for the antipersona was an appropriate decision; even with the data anonymised by pseudonyms and using images from licence-free platforms, if the person who answered the online survey read the antipersona, they would recognise themselves in it; this is not assumed to be the case for the other personas where multiple data points were used as sources.

Empathy mapping could have been used in addition to or in place of certain aspects of persona creation. Empathy maps assess user needs by bringing in the target group and requiring them to complete a map divided into four sections that ask questions about what was said, done, thought and felt [76]. Motivations, frustrations, and goals could have been extracted using those which, when combined with the online survey and literature review, would have resulted in either a replacement for the personas or a stronger foundation for persona creation. But the question of how to include digital nomads would have remained.

Another approach could have been to include expert interviews. Especially if the expert is involved both before and after the persona is created: in the first step, they provide insights into the target group, and on the last step, the expert provides feedback over the created personas. With the addition of additional data sources and, combined with the feedback loop, iteration for improvements, including expert interviews and empathy maps, would increase the reliability and validity of the persona. As improvements appear to be required in a future step, the persona should be iterated with the suggestions provided in the previous paragraphs.

7.2.5 Wireframes, Mockups and Prototype

The previous chapters' insights could not be tested in the usability study environment without designing wireframes, mockups, and a prototype. This, combined with the fact that a part of event findability and discoverability, which is what R3 asks, is about visual aspects and structure, demonstrates the necessity of these methods and their obvious influence on this thesis.

As the prototype was deployed in a usability study, the study itself served as an environment to demonstrate the validity of the chosen methodology. Participants who were unfamiliar with both the tool Figma and how a prototype works were clearly not prepared for what a prototype can and cannot do. For example, participants expected to be able to type on their keyboards and have the typed letters appear on the prototype, which was not possible. It is possible that the next iteration could be more effective for them because it would not be their first time using a clickable prototype anymore. Nonetheless, it demonstrates that the prototype would benefit from another iteration, especially given the improvements and inputs provided by the participants.

It might have been beneficial to the study's outcome to include a step between the creation of the wireframes and the mockups. The mockups and wireframes were created with Figma, with the wireframes being low-fidelity, and the mockups being high-fidelity. Especially, with such a middle step, evaluations could have been conducted with either the target group or experts, allowing for feedback loops.

Alternative methods for visualising the insights gained in previous chapters could be achieved using paper prototyping or "Wizard of Oz". Specifically, paper prototyping would work with previous steps such as wireframes or mockups and, in their low-fidelity appearance, could be completed quickly and evaluated with the target group or experts. Instead of a prototype, the "Wizard of Oz" technique could be used for the usability study. The main reasons for rejecting these approaches were the ability to conduct online usability studies and the fact that the study's conduct and participant recruitment would not be limited to a limited location range.

7.2.6 Usability Study

The usability study is the methodology to which all previous artefacts lead. It is directly responsible for determining whether the assumptions from previous chapters and the discovered insights are applicable to answer the research questions. It should be noted that the findings concentrated on R1 and R3 and to a minor degree R2.

Because of the usability study's relatively small sample size, the content's reliability can only be assessed to a limited extent. However, it should be noted that certain points overlap. For example, scenario 7 was the one where the majority of participants did not meet the success criteria or how the Updates' functionality was quickly discovered. As a result of the consistency of inputs, the data provided by participants is found to be reliable. What is missing is diversity as a result of the lack of representation from digital nomads.

The usability study focuses on the prototype's usability, but it does not examine whether the target group finds this type of application useful and necessary. No question was

asked during the usability study with the current target group if they would use it. As a result, in a subsequent iteration, this study would need to be repeated with the target group, specifically asking them if they would be interested in using such an application. In addition, as previously stated, the data provided by participants is incomplete due to a lack of insights from digital nomads. As a result, only assumptions can be made on the features and design patterns from which they would benefit.

The usability study is divided into three sections: pre-test, test, and post-test interviews. The framework of the usability study cannot be replaced because dividing it into three sections was a sensible decision. However, before the test, a survey or form that participants could fill out asynchronously to replace the interview could have been considered. However, this would eliminate the ability to incorporate spontaneous deviations, which was the primary reason why it was decided against. The previous section evaluated alternative approaches for the prototype.

7.3   Conclusion

Although not all research questions received the same level of attention, they were all adequately or very thoroughly answered. The methodologies used and how they were applied aided in answering the research questions. However, it appears that there are some limitations that need to be addressed in potential future research.

CHAPTER 8

Conclusion

8.1 Key Findings and Insights

8.1.1 Following Standard Practices

It was revealed at several points throughout the project's development that the prototype should adhere to standardised design practises, beginning with the literature review and progressing to competitor analysis and related work. As a result, well-known components are used for their common usage and placement in the application. This is why a bottom navigation was used for the application's main features, and it is likely the reason why scenario 9 of the usability study was completed so quickly, as notifications were accessed via the bottom navigation and visualised with a bell icon. That is just one example of why the decision to maintain standard practices has proven to be successful. Deviations from standard practices were met with confusion, as one participant pointed out that the "New" component in the notifications showing unread updates appeared to them to be clickable. This component had the same visual appearance as the filter options they had previously used in previous scenarios and therefore assumed them to be similar.

8.1.2 Navigation and Information Architecture

The relationship between an app's findability and discoverability and navigation and information architecture is corresponding. Therefore, by improving information architecture and navigation, the low findability and discoverability can be addressed. Surprisingly, the Discover screen contained one of the more present instances of low discoverability. The magnifier icon confused users, and they did not expect it to lead to a screen that shows the available group dinners. Rather than planned and prepared group dinners, one participant thought that it would have been a screen listing possible restaurants to visit. Similarly, one participant thought they could create a group dinner using the icon.

However, the usability study provided instances of successful information architecture and, consequently, discoverability. One participant said that they appreciated how the app opened and showed the upcoming group dinners. An additional participant expressed contentment with the "Discover Nearby" section, which suggested available group dinners.

The fact that attendees directly suggested ways to increase the event's discoverability was also encouraging. One participant proposed that when users have not joined events, they should see available group dinners from the Discover screen. With a button that led to the Discover screen, this could be an empty state for the joined events and a fantastic illustration of discoverability. In another instance, a user asked for more information to be displayed by the application, specifically an explanation of how the application functions. As a third example, a participant suggested recommending restaurants as potential venues for group dinners.

8.1.3   Consistency and Clarity

Several participants mentioned a lack of clarity in various places. Consider the fact that the application's name is *dinner stories*, but one participant concluded from that name that the application only supports dinner outings, despite the fact that it is also possible to organise breakfast or lunch in a group through this application. They wished that the application name was more precise in its wording. Another example is how the Discover screen suggests events "nearby," which led one participant to wonder which range is covered and how, with that wording, users do not know how recently the location information was updated and thus how accurate it is. Clarity also refers to a clear understanding of the visual cues of the application. The "Discover" element in the bottom navigation led to some confusion, and with the magnifier icon as a visual cue, one participant expected a different content behind it.

To some extent, these are discoverability issues. Users who encounter an application with an imprecise name may dismiss it because they believe that it will not meet their needs. Furthermore, users may avoid hosting outings during lunch or breakfast hours because it would indicate a mismatch in their intent. The "Discover Nearby" component is a direct result of increasing the discoverability of the application's existing events and bringing them to the forefront of the users' attention. However, the ambiguous naming may cause confusion and lead to users misinterpreting the range. During the usability study, the magnifier icon of the "Discover" element already caused confusion.

8.1.4   Account Management

Early on, the decision was made to exclude account management from the scope of this thesis. The reason for this was to focus on event management while excluding messaging features and profile management. During the usability study, it became clear that users missed this. With accounts, users have more information on the other participants in an

event, which may increase their sense of safety, and with proper accounts, corresponding features such as messaging capabilities are also feasible. Users can use messaging to stay in touch after an event and build a network within the application. The decision to exclude these features runs counter to the first research question, which seeks to answer how SNS can support in the formation of weak ties. With the addition of accounts, messaging capabilities, and network building within the app, the project would meet the criteria for an SNS [9], [10], [11], which it has not done so far.

8.1.5 Involvement of Target Group

It was very rewarding to work with the target group and evaluate their feedback. Their contributions, especially in relation to the usability study, had an significant impact on the findings, insights, and course of this thesis's research. I really appreciated their improvement suggestions for the application in general, but also on the discoverability of events. Not to be overlooked is how much I enjoyed the participants in the online survey sharing their, partly, very personal stories.

A lesson learnt from the usability study was how to work with participants who are not familiar with click prototypes and what they can and cannot do. The limitations of the prototype could have readily accounted for the diverse feedback that was obtained and the participants' misinterpretations of its features. Giving them more thorough instructions or a small prototype to test and play with before the actual usability study might have made sense.

8.2 Limitations

Digital nomads are significantly under-represented. The challenges encountered when recruiting participants for the survey and the usability study serve as an explanation for this. Yet, the only source available at this time is the literature review and the assumptions that were drawn from it, which means that the application is not well-targeted towards their needs and inputs as a result of this limitation.

However, as is typical with the user-centred design methodology, there should have been more involvement from the target group. To improve the prototype, at least one feedback round would have been necessary following the wireframing process.

Because the participants provided many improvement suggestions for the prototype, they need to be evaluated in a future step, as well as their potential to include them.

8.3   Future Research

It is obvious that the target group should have been involved more frequently and the digital nomads more thoroughly recruited in light of the mentioned limitations. As a result, the insights and findings would have been of higher quality. This is something that can be investigated further in subsequent studies, especially evaluating the potential solutions this thesis suggests. This allows for the improvement of both the antipersona and the digital nomad persona. As was already mentioned, they do not have any other data source besides the literature review; perhaps involving experts would have been a better solution.

8.4   Overall Conclusion

In this thesis, a technical solution for solo travellers and digital nomads was designed and evaluated in a field where not much academic research appears to have been done in the past. Numerous findings from the literature review's practical implications of this particular type of design have been validated, including the benefit of adhering to standard practices and offering a clear and consistent design. A personally satisfying realisation for me was the success of involving the target group, particularly since they offered insightful recommendations for how to make the app more discoverable. It is unfortunate that it has not been done more frequently, particularly with a more prominent focus on digital nomads. However, this opens up intriguing possibilities for future research that might be worthwhile to explore.

List of Figures

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