Seamless Group Trip Planning: Connecting Personal Inspirations to Unified Decisions

by

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Abstract

This study aims to conceptualise a digitally collaborative trip planning experience for travellers seeking personalised recommendations and assistance in group decision-making before and while travelling. The proposed outcome uses AI-generated preferences gathered from their selected social media posts to make personalised recommendation and an AI-chatbot to facilitate group trip planning.

To achieve this objective, key users were defined as tech-savvy, Gen Z individuals who prefer group trips and their behaviour and preferences were studied through literature review, participatory research, and auto-ethnographic observations. The key issues identified for the defined users before and during their trip included finding personalised recommendations and decision-making in a group while being remotely connected.

Based on the insights of this research one of the outcomes is an interactive prototype of the key features that are potential solutions for relevant recommendations with AI and an example case of AI chat-bot facilitation for ease of navigating the group planning process. This prototype includes the following key features:

1. Integration of saved social media posts to create a personalised itinerary, serving as a starting point. Furthermore, same data can serve as a resource for AI-chatbot to provide relevant suggestions.
2. An AI-chatbot that facilitates group discussion for encouraging diverse opinions, even participation and unbiased conflict resolutions.
3. Ability to modify itinerary by adding options and facilitating voting with a map view.

Travel-related service providers can benefit from insights gained through this study, enabling them to better understand and engage with the users. Furthermore, the design

process and interface design decisions can serve as a valuable reference for anyone in the field of user-centric application development which involves AI.

Acknowledgements

This thesis would not have been possible without the support and participation of numerous people.

Firstly, I would like to extend my sincerest gratitude to my supervisor Haig Armen, whose unwavering support and guidance have been instrumental in shaping this thesis. Your wisdom and expertise have not only inspired me but also paved the way for my exploration and understanding of complex design principles.

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Thank you all for playing a pivotal role in my academic journey.

Table of Contents

List of Figures

1. Introduction

"*What we're imagining in a future with gen AI or AI in general is that you start with something much more free-form and say, for example, "I'm looking to plan a trip with my family to New Orleans for a week in October. Can you help me find a hotel that has a pool for my seven-year-old and is within walking distance of the French Quarter?"*

Wouldn't that experience be much easier in terms of trying to figure out where you want to stay and what you want to do, as opposed to getting a list of a thousand hotels in an order that may or may not meet your specific preferences and what you want out of that trip? "
- **Vik Krishnan**

1.1 Project Rationale

Given the strong affinity towards travel among significant tech-savvy Gen Z members, they are the majority users of digital travel services (Thi Loan & Viet Hoang, 2023). Hence, the key users were further defined from the Gen Z demographic. Growing up in a digital world, a vast majority primarily relies on smartphones for most of their travel-related tasks, including pre-, during, and post-travel activities (Ozdemir-Guzel & Bas, 2021). Planning is an essential stage of pre-travel, as the rest of the experience depends on it. It encompasses the burden of expectation-related emotions and planning an itinerary that can meet those expectations (Nichols, 2022). Queries regarding destination, transportation, accommodation, meals, activities, and local customs and aligning them with the set expectations can be daunting (Fesenmaier & Jeng, 2000).

Additionally, group travel adds the challenge of resource sharing and coordinating, which is often overlooked in studies that focus on the marketing and influential aspects of travel. Considering that many people prefer to travel in small groups and rely on asynchronous e-collaboration through available applications for travel planning (Thi Loan & Viet Hoang, 2023), it is crucial to consider planning from a multiple-user perspective rather than a

single-user perspective (Zhang & Sun, 2016). Navigating an overwhelming volume of online resources and coordinating with peers is a challenge (Zhang & Sun, 2016). This challenge is not unnoticed, and emerging technologies have introduced applications designed for collaborative planning like Troupe and Wanderlog, with some also integrating AI to streamline the process. Though both applications let multiple users edit itinerary they do not cater to group planning at discussion and decision-making levels. Hence, solutions today have surface level features with ample room for improvement, making it a ripe area for design innovation.

1.2 Research Questions

- What are the characteristics, behaviour patterns and mental models of the key users?
- What are the challenges faced by these people while planning a group vacation remotely?
- How can we design to streamline the vacation planning process (finding relevant options and decision making) for the remotely connected group?
- What features should be part of an application that can assist in group travel planning (finding relevant options and decision-making)?

1.3 Objectives

This study aims to conceptualise a collaborative trip planning experience enhanced by artificial intelligence (AI) tailored to specific needs of the defined users. Furthermore, it streamlines the process of decision-making while planning and travelling.

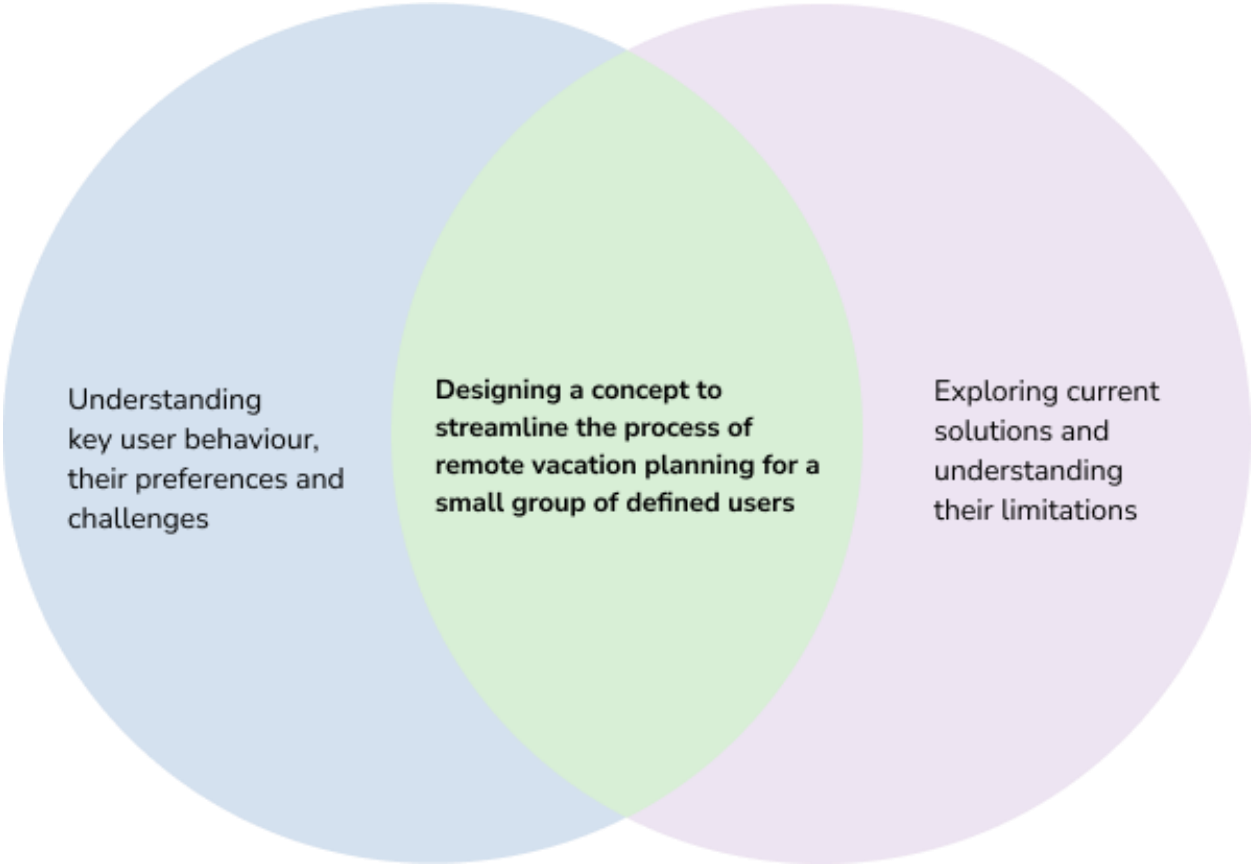


Figure 1 Venn diagram representing objectives.

1.4 Scope and Limitations

This research follows an exploratory design process using design research, prototyping, and testing. It focuses on identifying patterns and relationships between group travel planning behaviour and remote collaboration among the defined users to conceptualise a solution. **To limit the scope of this study the key users had been defined as tech-savvy, Gen Z individuals who frequently or occasionally enjoy traveling within a small group.** Moreover, the insights are based on primary research conducted with a subset of ECUAD (Emily Carr University of Art & Design) students meeting this profile. Due to the limited participant pool, this study only captures a segment of users, thereby limiting

the generalisability of the solution and rending the findings provisional. It is important to note that this limitation is intended only to delineate the scope, rather than to exclude.

To meet evolving users' needs, this concept would ideally use artificial intelligence. While a lot of us might see AI as a tragedy for humans, there is an undeniable pace of innovation within AI that continues to grow. The study recognizes the threats like the bias (Harding, 2022; Heaven, 2020) and risk of unethical surveillance but also the vast potential for a positive experience when implemented safely. This includes using AI to analyse large data and solve complex problems quickly.

This project focuses on proposing a positive experience for travellers planning in a group using AI, without delving into the technicalities. We are aware that AI technology is not flawless, and we are still exploring its capabilities. This research does not involve the creation of actual AI systems; rather, it offers foundational thoughts on how to build them responsibly in the future. The goal is to ensure that when AI is integrated into the proposed solution, its operation is transparent, users consent to its use, and it is safeguarded against misuse and privacy violations. AI should contribute to societal benefit, not just profit. Although the creation and testing of AI algorithms is not involved as a part of this study, it could still be helpful to generate a machine learning framework. This project's UX specifications can act as guides for creating the algorithm for recommendations or suggestions (Kore, 2020). The rapid evolution of digital technology may render some aspects of this research outdated quickly.

The prototype centres around the key features of an AI-driven collaborative travel planner like personalised AI recommendations from social media posts, facilitating decision-making, route optimisation & collaborative planning. As a result, the prototype only provides a specific set of features unique to this project rather than a comprehensive mobile app experience. The study does not advocate the use of social media in any manner

for the use of the proposed solution, it is rather tailored to cater to the existing user base that enjoy travel inspirations from social media.

Given the growing need and potential for improvement in current digital tools this research aims to leverage design expertise to propose a more personalised and inclusive group trip planning experience for primary users using AI capabilities.

1.5 Structure & Methodology

To design a solution according to the principles of design (*Framework for Innovation - Design Council*, n.d.) the initial step emphasises understanding the audience, which in this case is the tech-savvy, Gen Z individuals who travel within a small group. As a next step secondary research was conducted to explore the behaviour and travel trends among Gen Z demographics. Subsequently, primary research was done to validate the assumptions and get a deeper understanding of user needs and problems. Due to limited research on group travel planning and remote decision-making among Gen Z users, the demographic context is from recent articles and blogs.

Concurrently, technological capabilities that assist in travel planning were explored by experimenting with ChatGPT. Additionally, a comparative analysis of the existing travel planning solutions was conducted to get a better understanding of current offerings and user pain points.

In a later phase, participatory research was conducted with the understanding gained from existing behaviour to dive deeper into the nuances of each step of planning before, during, and post-traveling. However, since these interactions only provide a glimpse of the group planning dynamics, an auto-ethnographic observational study was also conducted to add insights from an actual travel scenario.

Synthesis of research led to the creation of two personas, a journey map which served as constant reference while designing. The persona and journey map helped to visualise the insights into a storyboard scenario of trip planning.

An iterative design process was followed with continuous creation and testing of mock-ups to refine the solution, adhering to the approach of iterative design for optimal results (Nielsen, 1993).

2. Setting the Context (Secondary Research)

This section sheds light on demographic behaviour and preferences, emphasising the reliance on social media and digital technology for most of the tasks, including trip planning. Beyond analysing this broad demographic for behavioural clues, a profound inclination towards a mental model that accommodates flexibility in trip planning is also discussed. Additionally, it highlights how AI is becoming increasingly integrated into our daily lives, despite its risks. Lastly, a comparative study of the group trip planning applications available today provides an understanding of the current market landscape and their limited features.

2.1 Demographic Behaviour & Preferences for Trip Planning

According to the Oxford dictionary Gen Z are “the group of people who were born between the late 1990s and the early 2010s, who are regarded as being very familiar with the internet”. Growing up in the digital era, a large majority rely on smartphones for most of their day-to-day tasks (Mason et al., 2022). These could range from reading the news, ordering groceries to finding discounts on their favourite brands. It is therefore typical for many of them to rely on their existing pattern of searching thoroughly through digital resources for the best deal when planning a trip as well (Thi Loan & Viet Hoang, 2023).

However, with the involvement of social media, the usage is not limited to browsing. In fact, social media platforms like Instagram, Facebook, and Tik Tok have a multifaceted and significant impact in the realm of trip planning (*The Path to Purchase*, 2023). One of the downsides is the phenomenon of FOMO (Fear of Missing Out) which compels some people to travel without it being a personal desire by looking at others on a vacation. On the brighter side, social media platforms help many youngsters to access relatable and authentic content about a destination that they may like to visit or already intend to visit. Hence, based on the situation social media serves as a resource or an inspiration. According to a study by Expedia Media, about 77% of people rely on social media for travel inspiration. Instagram, YouTube, & TikTok are the most popular applications used for inspiration (Gonzalez, 2024). An increasing number of people are preferring to explore off-beat locations, due to easy access to information from social media influencers. Given the Instagram behaviour of people saving posts and videos that they aspire to travel or add activities in their bucket list, wouldn't it be nice to have an itinerary directly created from those assorted inspiration folder? Replicating the feature or adding additional inspirational post links would just be an additional step. Hence, this was an important consideration for seamlessly connecting people inspirations to their planning phase after validating the similarity of behaviour with the participants.

A survey by Student Beans revealed a group of Gen Zs' average spending per purchase decreased for fashion (7%), tech (6%), and food (12%), while their travel purchases surged 60% (Roeschke, 2023). This is also reflected in the below figures that show 52% of them are frequent leisure travellers. While they have a variety of reasons to travel like attending a concert or event, adventure, or meeting family, the significant majority travels to relax (*The Path to Purchase*, 2023) Being tech-savvy, they are often considered to be the most aware mass in terms of taking care of mental health and physical health. Hence, many travel being aware of the travel benefits on their mental and physical health (The Gap between Traveler Expectations and Industry Perceptions, 2023) but at the same time, they also

understand the impact on the environment. So, many of them often choose sustainable and environmentally friendly options considering the well-being of the planet ("Gen Z in Travel," 2023).

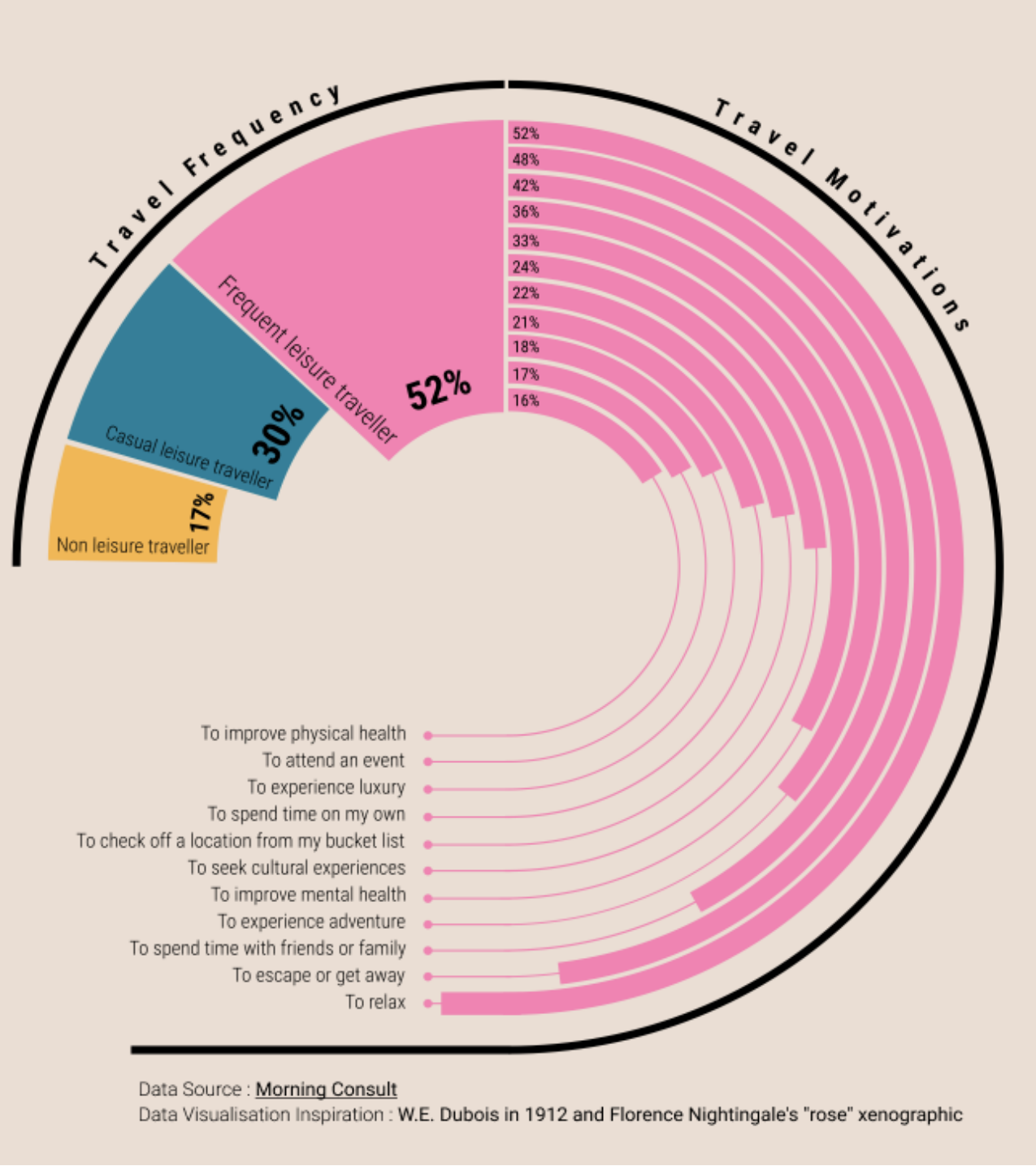


Figure 2 Data visualisation of travel frequency & motivations.

2.2 Experiences Enhanced by Artificial Intelligence

Majority of us, use some or other online service to get from point A to point B in our day-to-day lives. Without a Google map which optimises routes, predicts traffic, and acts as a personal navigator we would be clueless. We are all aware of Google's accidental collection of more than just location data with the street view cars. But after having realised the mistake, they immediately took the substantial steps to protect people's privacy and create a positive experience. More and more organisations are considering risk factors before employing AI in their products. Provided AI is developed within ethical boundaries, we can all agree that such intelligent services simplify our daily lives. The term artificial intelligence, or AI, is a very broad term describing the power of computer systems to carry out operations that would typically require human intelligence.

Modern AI, viewed through the lens of task-specific algorithms, amalgamates diverse algorithms to accomplish a set of goals as described by Kore. For instance, a travel application might integrate a reinforcement algorithm to tailor recommendations drawn from historical data, employ Natural Language Processing (NLP) to decipher human communication, or utilize vision algorithms for image data interpretation of places. These systems fall under the segment of narrow AI, characterized by their proficiency in dedicated tasks and distinguished from the theoretical constructs of super intelligent AI, which are said to surpass human intelligence across all facets—a theory that has stirred considerable discourse and threat among researchers. This study follows the 'modern AI' notion of an intelligent or rational agent seeking the optimal result even in the event of uncertainty. Further explorations and designs cater to this understanding of modern AI (Kore, 2020).

In the realm of travel, such algorithms are already used to provide personalised recommendations for flights, stays, and tours based on past travel history, preferences,

and behaviours (*The Impact of AI on the Travel Industry | McKinsey*, 2023). The real-time updates on weather, traffic and flight delays have allowed us to plan on the go.

By now Artificial intelligence is so deeply ingrained in our lives (Harding, 2022) that we only realise its importance when the internet goes down. It has made our interactions not only for travelling but also for routine activities like working, banking, shopping, and socialising efficient and easier. Progress in this field is seen to be growing making it inevitable and obvious to consider for this study.

AI-based Chatbot assistants

Chatbot also known as conversational agents are digital assistants created to interact with humans in real time. These can be categorized into two types: Rule-based chatbot and Advanced chatbot (Mucci, 2024). A basic rule-based chatbot used for simple tasks like customer service operate on defined parameter and pre-set responses. Whereas an advanced chatbot driven by AI has a capacity to mimic human conversational patterns, solve problems, respond dynamically, and improvise based on past interactions.

Within Slack channels, for instance, such AI-driven chatbots have been instrumental in summarizing long conversations and alerting user to mentions and reminding for scheduled meetings. Similarly, social networking chatbots on WhatsApp and Snapchat can be added to a group for problem solving or coming to a consensus. Most of these chatbots are only activated upon user's request. However, emerging research has laid the groundwork for having proactive chatbots that can facilitate group discussions by considering diverse opinions, promoting equal participation, and facilitating a non-biased decision (Kim et al., 2020). Remote group decision making for travel can highly benefit from such an AI-based chatbot facilitator.

Presented below is a table that captures the comparison of abilities essential for precise and effective facilitation for group trip planning between humans in the group, human travel agent, rule-based chatbot and advanced chatbot that uses AI.

Scale

High - Indicates facilitator performs exceptionally well, with advanced capabilities for this task.

Moderate - Indicates facilitator performs adequately in this area, with abilities that meet basic requirement.

Low - Indicates facilitator performs the task with limited scope and effectiveness.

Variable - Indicates performance to vary based on individuals or situations.

Abilities	**Human Facilitator from the Group**	**Human Facilitator- Travel agent**	**Rule-based Chatbot Facilitator**	**Advanced Chatbot Facilitator**
Personalised Interaction	High	High	Low	High
Understanding of Complex Needs	High	High	Low	High
Real-time response rate	Moderate	Moderate	High	High
24/7 Availability	Low	Low	High	High
Problem Solving skills	High	High	Low	High
Ability to handle large data	Low	Moderate	High	High
Personalised suggestion	Variable	Variable	Low	High
Multi-language Support	Variable	Variable	Moderate	High
Promote equal & diverse opinions	Variable	Variable	Low	High

2.3 The Balance Between Pre-planning and Spontaneity

This study does not assume all vacation types demonstrate the same decision-making pattern, rather it builds upon a conceptual framework that suggests the decision-making depends upon the characteristics of trip and traveller (Hwang, 2011).

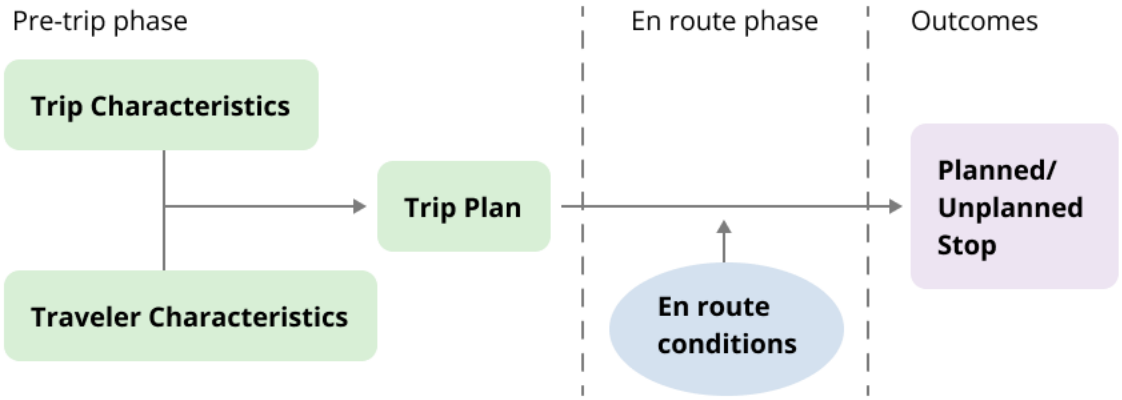


Figure 3 A conceptual approach to travellers planned and unplanned attraction visits (adapted from Hwang, 2011, p 289)

This study explores the planned and unplanned aspects of the trip drawing from the enroute theory of Hwang and mental models by Indi Young. Hwang suggests that people usually anticipate their planning with insufficient or incorrect information available to them and then revise it based on the enroute conditions that arise and new information collected while travelling. While these decisions are highly dependent on the traveller's characteristics, measuring the unplanned travel decisions is still under research (Park & Roehl, 2016)

Travel planning from a mental model perspective became necessary, to better understand the thought processes and mindsets of people during planning. We generally have a sequence of tasks in mind for approaching a problem based on our past experiences which can be visualised through a mental model (Young, 2008). In the case of travel planning

many factors come into play like the personality of the person, level of comfort with spontaneity, tolerance with risk and logistical preferences. Moreover, a person who is spontaneous majority of the times, depending on the situation may preferred planned things and vice-versa.

Acknowledging the gaps in the literature regarding mental model for travel planning, this study seeks to identify the patterns of travel planning process through participatory research.

2.4 Remote Collaborative Planning

Most of the communication for Gen Z with friends primarily occurs through texting on their phones. They are also efficient at collaborating remotely for work and education, demonstrating a comfort level with digital tools and remote means of communication. Given their preference for texting and their experience with remote collaboration tools, it is reasonable to deduce that they would also likely use a digital tool to plan their trips remotely. The remote collaboration planning for a trip would include several tasks, including the planning of the schedule, transport, accommodation, the choice of activities, and others. This would also entail considering the diverse opinions and coming to a consensus. This definition of collaborative planning is similar to Healey's description in "Collaborative Planning: Shaping Places in Fragmented Societies" (1997) which also highlights shared ownership and inclusion in planning. However, planning collaboratively while being remotely connected is still a notable challenge for many (Gonzalez, 2024)

In the case of remote work, efficiency has been improved by asynchronous planning and automating some of the tasks like scheduling meetings, setting reminders, and assisting in drafting documents. In recent times, progress has been made with AI analysing large

volumes of information to provide insights for informed decision-making, crucial in remote teams.

Despite considerable young travellers holidaying with their friends, very few studies have attempted to explore the topic of shared decision-making among groups of friends travelling (Decrop, 2005). Therefore, the understanding of digital collaborative planning is derived from the models of remote work environments and is further investigated by means of an examination of the collaborative trip planning applications that are now in use.

2.5 Comparative Analysis

Comparative analysis was carried out to understand the current user experience offered by applications serving the need for collaborative travel planning. Primarily an exhaustive list of all trip planning applications was created and classified into two groups: direct competitors or those focused on group travel planning, and indirect competitors, or applications related to planning in some way. From a pool of 11 direct competitors, three were further shortlisted based on popularity and unique features. Among the three were Troupe, MiTravel, and Wanderlog. The aim was to study the features, and their relevancy and derive valuable insights from the user reviews. A thorough evaluation was conducted on each of the following factors: services offered, pricing, value propositions, establishment dates, reviews and ratings on the App Store & Play Store, features, the tone of the copy, and the overall user experience.

Discovery and Analysis

Figure 5 Group collaboration with voting.

Figure 4 Smart search with AI Assistant

[Troupe]

Troupe is a collaborative planning application launched in 2020 that places a strong emphasis on group coordination. Its standout features encompass the ability to make suggestions, conduct polls, facilitate voting, and make decisions. The desktop version further integrates an AI assistant named Troupie, enhancing the user experience with map views and accommodation recommendations. However, this functionality is currently not available in the mobile application. While the application is user-friendly, its usability is hindered by a relatively high number of required clicks for navigation and planning. The manual process of adding places to the itinerary contributes to this challenge.

Figure 8 Collaborative Itinerary

Figure 7 Search with AI

Figure 6 Resources from social networks and blogs.

[Wanderlog]

Wander log, launched in 2019, offers a comprehensive solution for vacation planning with a strong emphasis on user-friendly design. This all-in-one app allows users to plan & track their travel plans, explore new destinations and accommodations, and exchange travel tips with friends and fellow explorers. Wanderlog covers everything from collaborative itinerary creation to expense management. However, it lacks a clear focus on collaborative planning tasks, such as discussing and negotiating options. Nevertheless, it excels in providing an excellent map view alongside itinerary planning, making the planning process more convenient. Additionally, the AI assistant, while a valuable feature, is not yet seamlessly integrated to offer a fully personalised journey experience, requiring users to interact with it separately.

Figure 11 Mood board style itinerary.

Figure 10 Poll feature for group decision making.

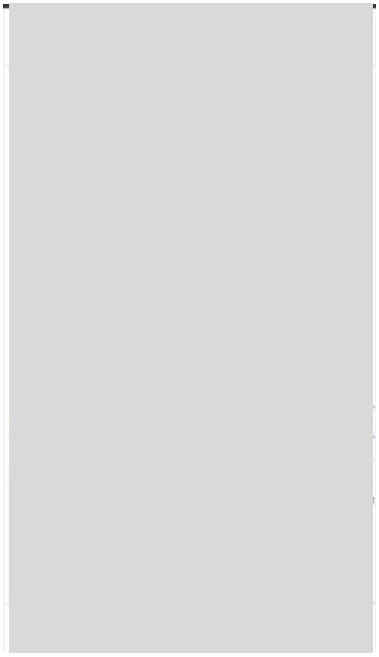


Figure 9 AI Assistant which in not context aware.

MiTravel

Mitravel is a collaborative itinerary planning tool that is still in development and is squarely focused on refining the collaborative planning experience. This start-up is currently in its beta testing stage. Mitravel incorporates features like polling, voting, and note-taking, akin to what Troupe offers. What sets it apart is that all these collaborative activities occur on a virtual board accompanied by an integrated map, enhancing the planning process. In addition, it offers a convenient 'search and add destination' feature, like Wanderlog, simplifying the process of adding locations to the itinerary. It also has an AI assistant which is again context aware and acts as a separate search engine.

Findings

Observing the continuous evolution of these applications in response to shifting market demands and technological trends reaffirmed the validity of the problem space. The consistent user reviews, all expressing a clear desire for an enhanced collaborative travel

planning experience, provided additional confirmation of the timeliness of such a solution. Furthermore, the ongoing initiatives of established applications like Wanderlog and Troupe to integrate AI features highlight the increasing significance of AI assistants in group travel planning. However, it is important to note that these AI integrations in existing solutions are not yet fully polished or seamlessly implemented; they often function as additional features rather than integral components of the user experience. It is within this context that the potential to design a group travel planning application that takes full advantage of AI-technological advancements to enhance the user experience is recognised.

3: Primary Research

As a part of primary research a participatory research activity, Experiments with ChatGPT the basis of informal interviews, and an auto ethnographic observation study were conducted. For each method, the below text delves into the rationale behind its selection and the specifics of how the research was carried out. This is followed by an analysis of the findings, and a reflection on the methodologies employed, considering how they might have been optimised.

3.1 Informal Interviews

Understanding people's expectations and problems with human travel agents was essential in the initial stages of designing an AI-based travel assistant. It was also important to determine whether AI would be able to address these needs. Hence, informal interviews were conducted with 5 participants to understand their experience with travel agents and identify opportunities for AI travel assistance and pain points.

Analysis & Discovery

Participants expected travel agents to plan and book travel arrangements as per their needs and preferences. They preferred having recommendations for activities, tips, and advice. Apart from that in case of any unexpected events like flight delays or severe weather, they expected agents to navigate and reiterate the plan.

During the interviews participants showed openness towards having an AI driven travel agent and the willingness to explore the potential.

Some of the common pain points highlighted from the interviews were as follows:

“Telling the Advisor about all your preferences.”

“Uncomfortable sharing personal preferences.”

“Incomplete advice on safe places to travel.”

“They don’t know you well enough to suggest the best option.”

Findings and Reflection

At this stage, the decision of moving forward with the AI as a solution for travel planning was still in the air. Hence, informal interviews proved to be quite helpful for this study in gathering user thoughts on travel agents rather quickly.

3.2 Experimenting with ChatGPT

With this understanding of what users expect out of a travel agent, experiments with ChatGPT (AI based chatbot that uses natural language processing to create humanlike conversations) were conducted. ChatGPT was assumed to be a digital travel agent and the researcher acted as a potential user planning a trip.

Approach 1: A conversational approach where users can ask questions, put forward their preferences and gradually refine their choice of a destination based on the suggestion made by AI-chatbot.

Approach 2: Users can enter their preferences by answering pre-set questions which would enable the algorithm to curate a perfect itinerary. Further modifications can be made through conversation. (Note: In the example below the preferences are presented in the form of a chat which would be collected beforehand.)

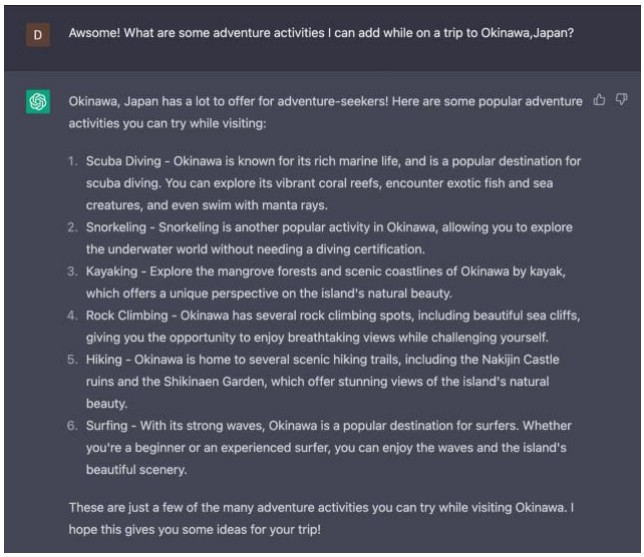


Figure 13 List of activities.

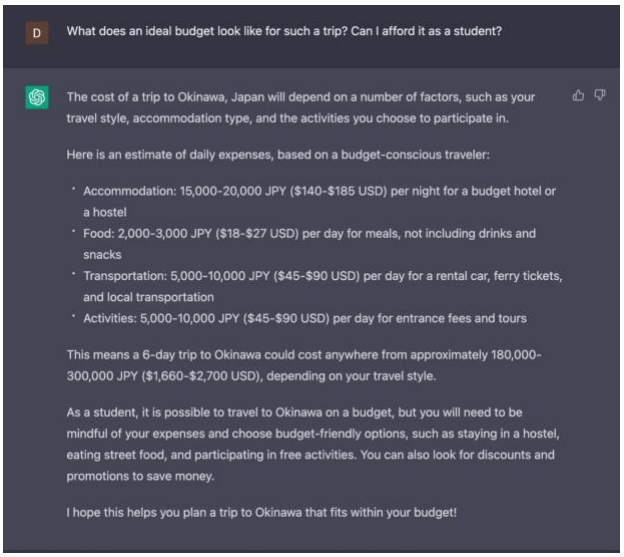


Figure 12 Budget Calculations

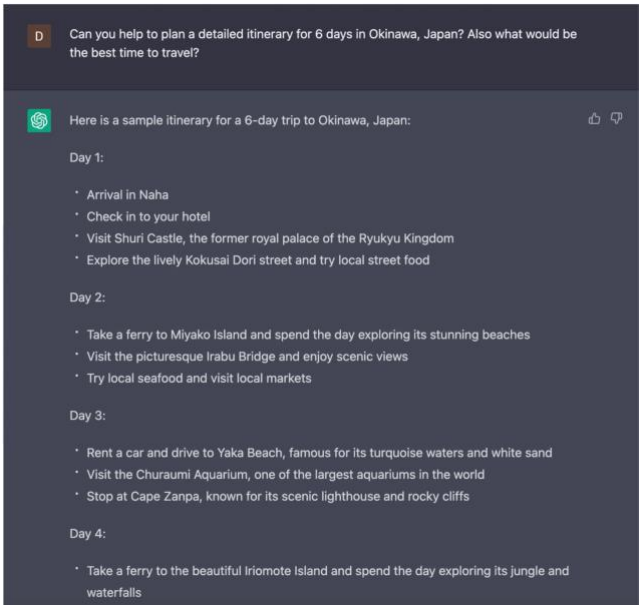


Figure 14 Detailed itinerary.

Note: Figure 12,13,14 and 15 are screenshots of conversation generated by the researcher using GPT-3, OpenAI's large-scale language-generation model

Approach 1:

The chatbot was prompted to suggest adventure activities in Okinawa, Japan. As expected, it generated a list again with a description which helped to visualise that activity. (Refer to Figure 13: List of activities)

Subsequently, the Chatbot was asked to formulate a comprehensive itinerary for a six-day vacation to Okinawa. Despite initial reservations about its capacity to handle such a complex task, the results were unexpectedly impressive. The AI-chatbot generated a detailed itinerary, encompassing a variety of activities, suggested tourist spots, and culinary delights for each day of the journey. The intricacy and accuracy exhibited by the AI were noteworthy (Refer to Figure 14: Detailed itinerary). Furthermore, the AI was tasked with calculating an overall budget for the Okinawa trip. It produced an efficient and comprehensive estimate of the expenses as well. (Figure 12: Budget)

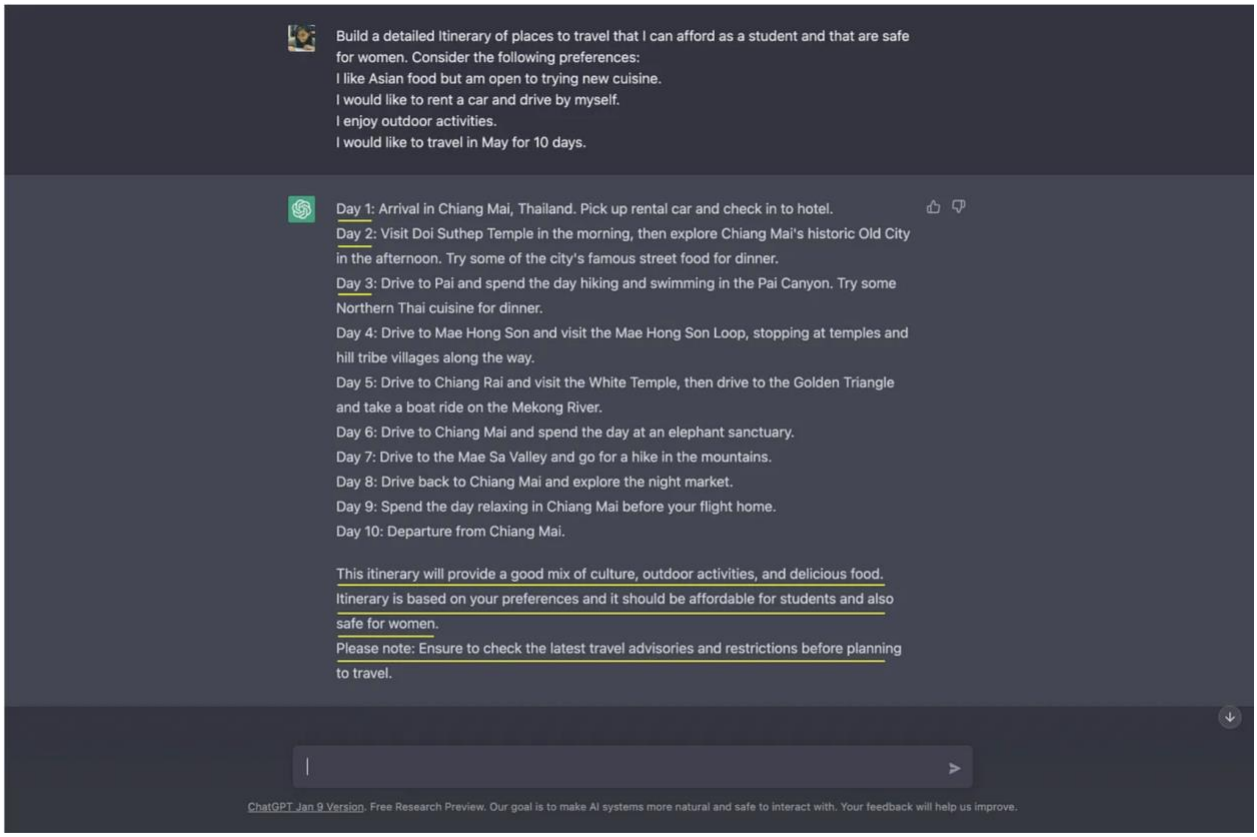


Figure 15 Itinerary based on preferences.

Approach 2

By clearly stating all preferences in a single request to ChatGPT (for testing purposes), it generated a comprehensive itinerary, breaking it down into daily activities that include

recommended places to visit, food to try, and activities to participate in. It also ensured that all preferences were considered be it of multiple people. (Refer to Figure 15: Itinerary based on preferences). This method of obtaining the necessary information first and then generating the itinerary based on it seemed efficient as compared to the previous one.

Findings and Reflection

It was evident from the experiment that conveying the needs to the system was the only way to get the most precise outcome. The results accuracy depends highly on the input precision. However, not all users may know exactly what to ask for, risking the possibility of missing an important preference. Hence, approach 1 is taxing, both in terms of time and cognitive effort. Having multiple outputs makes it difficult to track for the correct one. On the other hand, approach 2 simplifies the process by offering pre-set questions for preference selection, leading to a generated itinerary. As netizens, people have grown accustomed to relying on prompts and recommendations for searching, so for a digital travel agent to be effective, it should be able to guide the conversations and possess contextual awareness.

3.3 Participatory Research

To understand the nuances of collaborative planning across groups of different numbers of people, a participatory research study was conducted with 1, 2 and 3 people in a group. This research activity also sought to identify the planned and spontaneous areas of the trip, as well as its relevance.

The participants were given post-it notes with tasks written on it like accommodation, travel, budget, activities, taking and uploading pictures, and other related items to be arranged under one of the four travel phases: pre-planning, planning, while travelling, and post-traveling. Questions related to each of these tasks were asked while the participants performed the activity.

Preplanning is the stage before planning for the final spot, when the possibility of visiting a potential spot is being considered.

Planning begins as soon as an agreement to travel is made and a particular trip is discussed.

While travelling is when one has started the journey towards the trip destination until one return home.

Post travelling is the period following one's return from the trip.

Discovery and Analysis

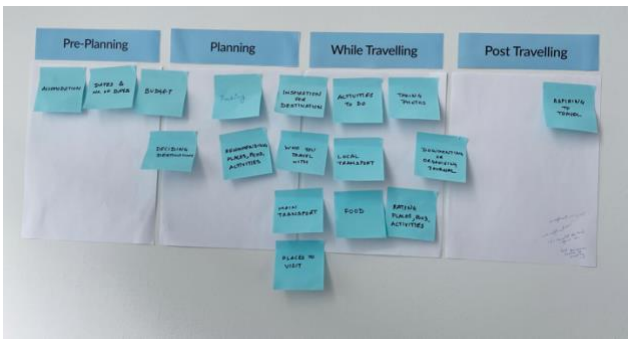


Figure 17 Result of activity with 1 participant.

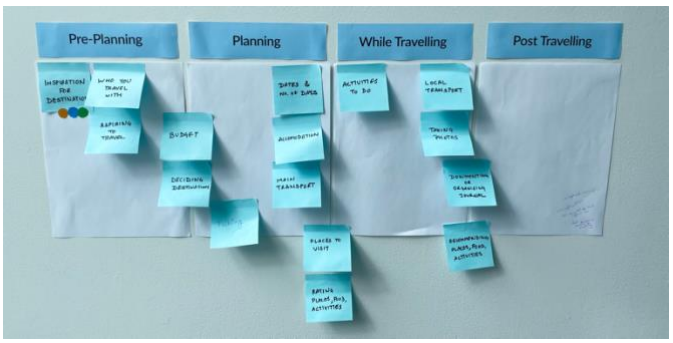


Figure 16 Result of activity with 2 participants.

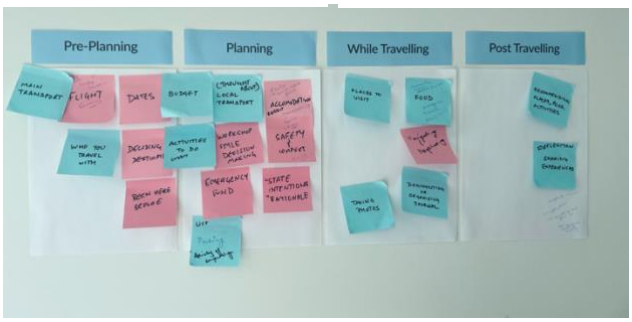


Figure 18 Result of activity with 3 participants.

The participants were unable to provide clear responses when asked to imagine a future trip as they did not have any firm plans. Rather, they found it easier to respond to the inquiries based on past experiences.

Despite the different numbers of participants, no notable differences were observed between the planned and spontaneous portions of the journey. The top priority during pre-planning was reaching an agreement on dates, followed by comparing flight costs to determine a destination. While some preferred to seek inspiration as a part of pre-planning even before creating a budget, others preferred to look for inspiration later somewhere between pre-planning and planning.

Booking accommodations was a crucial component of planning that was desired by all participants. Participants mentioned thoroughly checking prices with and without taxes, comparing several options and negotiating for comfort. One participant described her unsatisfactory stay at a budget hostel, mentioning the smelly shared restrooms and uncomfortable bedding as reasons why her trip was less enjoyable overall. Based on the Peak-end rule people remember the experiences at the intense point and end points rather than each moment (Bassett, 2023). Having understood that People sought accommodation that was more than a stay based on their previous experiences. Clearly, accommodation played a role in creating memorable peaks by offering comfort and amenities like a pool, private washrooms, Wi-Fi, and ease of access. However, while planning, other aspects like internal transport, places to visit, and activities were considered with a degree of flexibility, mostly left open to last-minute adjustments.

The prioritisation of planning accommodation over places to visit mirrors the principles of prospect theory (Kahneman & Tversky, 1979) which states people are more driven to prevent losses than to make gains. When planning a vacation, finding a good place to stay is top priority because it is thought to be a means to avoid suffering a big "loss." A bad

hotel selection can significantly reduce the enjoyment of the vacation. So, making sure to have good lodging is like not losing money. Planning events and attractions, on the other hand, which are seen as "gains," is frequently more adaptable. This flexibility reduces risk and allows for travellers to make impromptu decisions and changes based on their experiences and current information while on the road.

While grappling with the overwhelming amount of information while planning, they preferred AI to provide a shortlisted set of options rather than making the final decision. Here are a few statements from the interviews that capture the emotion of searching through a plethora of sources to discover the ideal option.

“It's a little overwhelming because it's like a lot of considerations. I would say that at least because I mean I'm not in a position in my life now where I can pick any Airbnb “

“So, I'll pick like five and then I'll go and revisit them and be like, well, how much are they actually? And so it's a second layer of filtering.”

“I feel like it's really helpful. I mean, it's overwhelming in some way. And then you have the goal of finding out the details about this city so there's gonna be lots of reasons like that you get through reading this post. Personally, I feel like less anxious about like reading it then just go somewhere and have like no expectation”.

In terms of collaborating in a group, participants expressed an interest in negotiating and compromising while still being able to do things that were favourable for them. In contrast to the individual candidate, who was more focused on their personal checklist, those in groups of two and three were more considerate of others' opinions.

Findings

The primary finding was a pattern in the dynamic model of planning which included collaborating and booking for high-stake elements like accommodation and transport but allowed for flexibility for places to visit and activities. Additional results from this exercise supported the demographic data that using multiple applications to plan a vacation is common (Expedia Media). Lastly, a participant travelling the next day mentioned about her stress of committing to the school activities along with preparing for the trip. This highlighted the challenge of balancing daily chores with the demands of planning a trip.

Reflection

In a mock round conducted with a participant, questions were asked chronologically from the prepared list. It soon became apparent that this approach was interfering with the participant's flow of thought while putting the post-it notes. So, the format was improvised to offer questions based on the participant responses. This way they were able to provide specifics and details to the scenario. However, this made it challenging to remember which questions were answered and which ones were not. Nevertheless, this approach was chosen as the finer details provided a better understanding and gave depth to the response.

Responding became challenging for participants when asked to envision a scenario that entailed the consideration of numerous factors, thereby imposing additional cognitive strain. Which is why the participants found comfort in answering based on a lived experience. Thinking of a previous trip, contradicted the idea of travelling with the other participants. Hence, this activity did not yield many insights into group dynamics while planning.

Instead of having multiple areas of intervention this activity could have been split into two parts. The first part to understand the planning journey encompassing the planned and

spontaneous areas. While the former part could have been aimed at group dynamics using a specific situation and tasks.

3.4 Auto-ethnographic Observations

During a trip involving four travellers, including the researcher, auto-ethnographic observations were conducted from the stage of pre planning until post travelling. These observations were documented on Google notes and further expanded after the trip. To ensure integrity of the research no conversations or events were altered, and the travellers were not informed of the research activity. The observations were made taking the necessary precautions. No conversations or situations were manipulated for the sake of research. This approach aimed to capture authentic experiences and insights into the travel process. To do so complete anonymity of the travellers' identities is preserved throughout the study.

Discovery and Analysis

While being in distinct parts of the world with different time zones, finding mutual time to communicate was a challenge. The entire planning until the day of travel carried on for 2 months during which very few calls were made with everyone's presence. The longest calls were for discussing the initial idea of the trip and booking accommodation. Otherwise, most conversations took place asynchronously over text.

Booking.com, Expedia and other platforms were used to search accommodations and flights which were then shared on the group for discussion. For accommodation there were different preferences that came up in terms of budget, facilities, ambience, and location. After a lengthy process of negotiation and multiple discussions, two accommodations were selected. One with a lower budget and another at a prime location with facilities were booked for different halves of the trip. After booking the flights and accommodation more than a month in advance, planning the itinerary was brought up multiple times but no

initiative was taken to do it with the group. Individually, people would take inspiration from YouTube videos, Instagram posts and share links on the group.

While travelling in a group, individuals openly expressed their preferences and were accepting towards taking up different activities based on their preferences. On a particular day while some travellers enrolled in an adventure activity the others enjoyed a restful day at separate locations. All of them got together at the end of day to grab dinner and expressed enthusiasm to learn about each other's experience.

However, in another instance when the group unequally split on a plan to socialise with new local acquaintances, the individual with difference in opinion seemed to have been under pressure to move forward against the will since the majority aligned on the plan. Although initially resistant, acknowledging the group's collective preference led the individual to eventually agree with the plan. This instance reflects the complexities of group dynamics, especially when decisions do not align unanimously within the group.

Findings

Multiple applications were used to plan and make booking aligning with the former collected the data and participatory research. When planning a trip, certain choices such as accommodation and transportation require consensus among the group. Conversations become difficult when individual preferences are different from those of the group. Such conflicting situations seek a non-biased approach in decision making. The overall planning journey consisted of the planned and flexible in alignment with the participatory research findings.

As a result of the primary research, it can be established that people are exploring easy options to plan. Besides the literature (*The Path to Purchase*, 2023) interviewed participants and autoethnographic observations also reinforced the use of multiple digital tools for

planning in advance and making changes as needed. Similarities were spotted in terms of the planned and flexible mental models of the trip. Behaviour patterns such as asynchronous planning and the challenges while communicating remotely were highlighted. Nevertheless, an established understanding of individuality and diversity of preferences led to openness to different plans.

4. Synthesis

4.1 Insights

Overall, the digital dependency leads to the need for more convenience and efficiency in the planning processes, participants frequent use of numerous applications and platforms was a clear indication of their digital dependence. The reliance on technology has made complex tasks like keeping track of the bookings and sharing resources across the group much easier. However, unmet needs like hyper personalised search results and effective asynchronous collaboration drive the demand for innovation. The primary research provides valuable insights into such areas that are crucial for remote group trip planning.

Demand for Hyper Personalised Content

The main source of inspiration being social media, reflects participant's preference for personalised content and authentic information. They follow travel influencers that align with their values and preference, the algorithm analyses this behaviour and suggests more posts like that. This process enables participants effortlessly discover relevant and authentic content. The comparative analysis of trip application also points towards the increasing usage of AI to get personalised itinerary and travel recommendations.

Diverse Preferences - Respect for Individuality:

Participant's tolerance for a wide range of preferences reflects their regard for personal uniqueness. They were open to the notion that members of the group may choose to engage in different activities while on a trip and values diverse experiences. Their acceptance of diversity and appreciation of differing interests makes for a more adaptable vacation experience, acknowledging that being together all the time is not required. Though they acknowledge diverse preferences they are firm about accomplishing personal interest and preferences.

Asynchronous Collaboration - Adaptability to Varied Schedules:

Planning a trip for the participants was not an isolated task. It existed amidst numerous daily responsibilities ranging from academics to household chores, part-time jobs to social interactions, and keeping up with trends. Many also plan trips with friends located in various parts of the world in a different time zone. Their multifaceted lifestyle and cross time zone connectivity emphasise the necessity for asynchronous communication methods that work well with their hectic schedules. As a result, travel planning can be a more inclusive and stress-free experience since they can participate at their convenience.

Balanced & Effective Decision-Making Process

Conflicting scenarios where individual preferences are different from those of the group, often pose a challenge as per observations. Such situations seek for a non-biased approach in group travel planning wherein multiple perspectives are considered equally. Remote planning also calls for considering delayed, asynchronous cognitive processes to support some planning decisions. This would also be an advantage for those, who find it challenging to participate in a real-time debate.

Dynamic mental models

A dynamic planning approach with a flexible mental model, willing to accommodate any modifications was favoured by all participants. Even while the itinerary may have certain

predetermined elements, there was still sufficient flexibility to allow for unforeseen events or modifications. This mental model was common among the results of participatory research and auto ethnographic observations, which indicate that the pre- and during-travel stages consist of a combination of structured and flexible components that accommodate the group's varied and changing preferences. Based on the analysis of primary research the tasks involved pre travel and during travel were categorised under “Definitely Planned” and “Flexible” mental models of the participants.

Figure 19 Definitely planned and flexible areas of the trip represented with post it.

4.2 Persona

Based on the results of primary research, personas depicting the two archetypes—the **Instagram-Savvy Scenic Lover** and **the Budget-Conscious Explorer** —were created. The purpose of this action was to feed the creation of a scenario that may function as a

convenient point of reference for the design of application.

Persona 1: Amanda, The Instagram-Savvy Scenic Lover

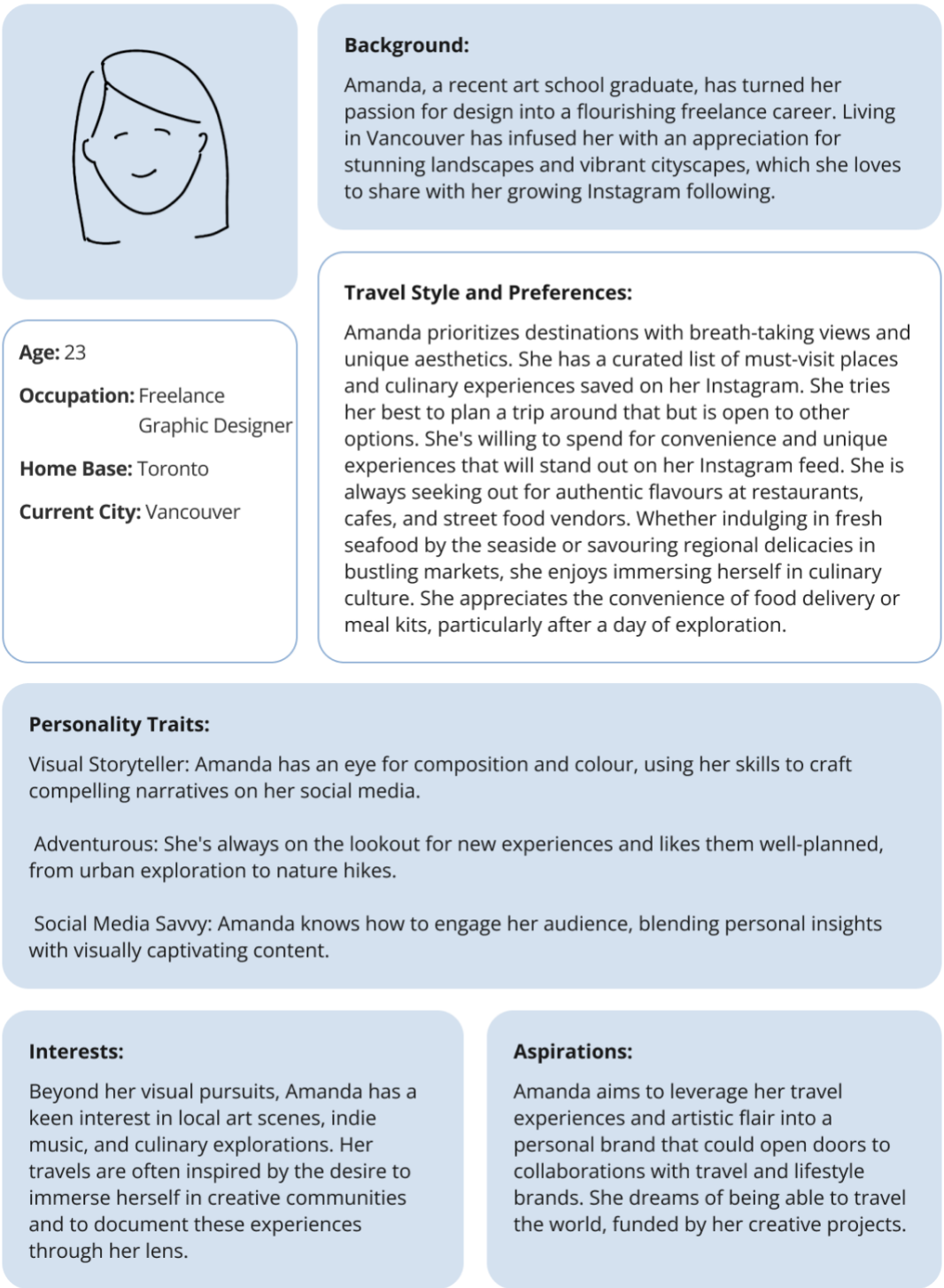


Figure 20 Persona 1: Amanda, The Instagram-Savvy Scenic Lover

Persona 2: Rachel, The Budget-Conscious Explorer

Age: 22

Occupation: University Student (Computer Science Major), Interning at SAP Labs

Home Base: India

Current City: Vancouver

Background:

In her final year at UBC, Rachel is completing her degree in Bachelor of Computer Science. Raised in a family that emphasizes frugality, Rachel has mastered living well within her means, applying this principle to all areas of her life, including travel.

Travel Style and Preferences:

Rachel's approach to travel is all about maximizing experiences while minimizing costs. Luxurious accommodations don't appeal to her; instead, she opts for hostels, budget guesthouses, and camping. These choices reflect her desire to allocate more of his budget toward activities like hiking, snorkelling, or exploring local cultures and cuisines. She is an adaptable traveller who thrives on spontaneity and is comfortable with a degree of unplanned parts in her journeys. She's an avid user of travel apps and websites that help her find the best value for money and often chooses Airbnb's that offer kitchen facilities to further reduce expenses.

Personality Traits:

Resourceful: Rachel has a knack for stretching her dollars and finding creative ways to enjoy her travels without breaking the bank.

Socially Active: She has an easy-going nature that makes it simple for her to connect with others, enriching his travel experiences with new friendships and insights.

Adventurous: Always ready for a new challenge, Rachel seeks out activities that push her out of her comfort zone, whether it's trying a new sport or navigating a city where she doesn't speak the language.

Interests:

Driven by her curiosity about the world and a desire to immerse herself in diverse cultures, she enjoys outdoor activities that allow her to explore new landscapes but is equally interested in urban exploration, where she can dive into the local food scene and historical sites. Meeting new people, whether they're fellow travellers or locals, adds depth to her travel experiences, providing her with different perspectives and stories.

Aspirations:

Beyond her academic interests, Rachel envisions a future where she can merge her love for travel with a career that allows her to explore the world. She's open to opportunities that will enable her to work remotely, potentially in tech, giving her the flexibility to travel and work from anywhere.

Figure 21Persona 2: Rachel, The Budget-Conscious Explorer

4.3 User Journey Map & Scenario

Taking into account the nuances of group trip planning involving different preferences, a journey map was created. This map visualises a scenario in which Amanda and Rachel two friends who collaboratively plan a trip together. The journey begins from the inspiration phase until they start travelling. Each phase expands further into the relevant touch points based on the activities involved and emotional ride throughout the communication and decision making. Potential design opportunities for each phase were identified through this comprehensive process.

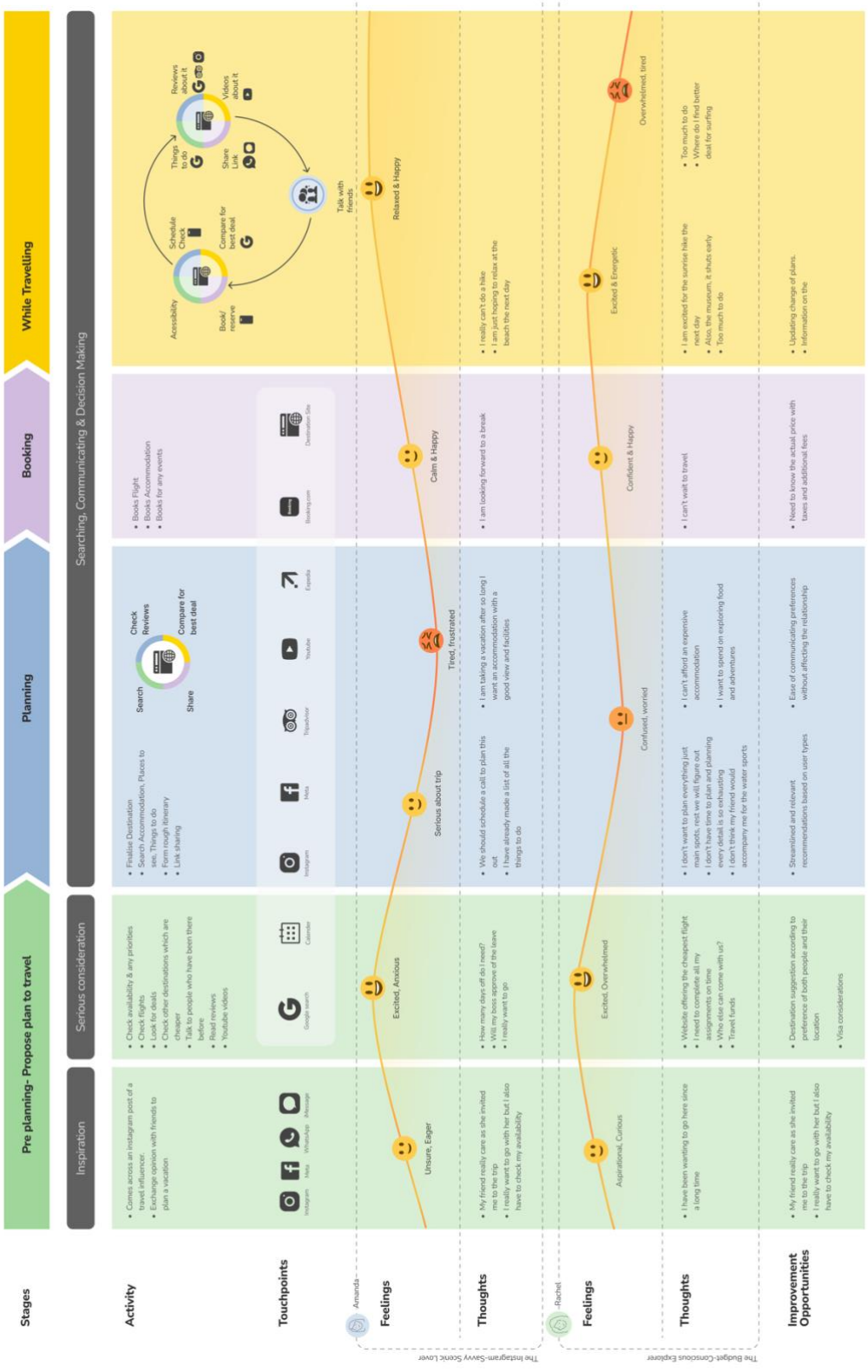


Figure 22 Journey Map of Amanda and Rachel.

Scenario of navigating conflicting thoughts regarding accommodation

Imagine this scenario, where two friends Rachel residing in Toronto and Amanda in Vancouver are planning a five-day trip to Bali. They have already gone through the phases of inspiration and serious consideration during which they booked the flights. They have 25 more days until the trip, and they are now considering stay options. In the below scenario Amanda and Rachel hit a conflicting point, specifically concerning budget, amenities, and views while discussing accommodation. Amanda prefers to economise on accommodation, opting for a less expensive stay. In contrast, Rachel prioritises comfortable stay with facilities and a scenic view. A context aware AI chatbot called Zeelo who is also a part of this conversation analyses their needs and helps them navigate the situation with ease.

The algorithm, being trained on best approaches to navigate group decision-making, suggests ranking from the identified factors concerning users for choosing an accommodation option. This way users were able to express preferences in a more detailed manner, not just their top choice and avoid polarised outcomes. The respective features of the chatbot are highlighted by the number and explained later.

Figure 23 A Storyboard of AI chatbot facilitation through an example.

1. Relevant and personalized recommendations

• Offer recommendations based on the group's expressed interests and past preferences.

2. Analyse Group Needs, Problems & Conversation Dynamics

• Collect & analyses data on keywords and phrases related to travel planning, like "accommodation," "time," "location," etc.

• Tracks the frequency and sentiment of each participants contributions.

• Determines the main topics of discussion and conflicting opinions.

• Leverages analysis of previous chats to understand group interests and common decisions.

3. Promote Equal Participation

• Detects less active or influential group members based on their participation level.

• Direct questions or prompts to less active members to encourage their input to foster inclusive conversation.

4. Facilitates decision-making

• Suggest an optimal path forward based on learnings from research papers regarding approaches for effective decision-making in small group.

• Summarizes the points made so far to ensure everyone is on the same page.

5. Maintains Transparency

• Is transparent about the way it operates

• Gives credit and ownership to relevant sources it was trained on or takes inspiration from.

6. Privacy Focus

• Ensures confidentiality of user responses.

5. Outcome

5.1 Ideation

The ideation phase involved unrestricted brainstorming, a common approach in design to foster creativity. However, this led to digression from the core focus, resulting in looping into designing the onboarding steps. A critical turning point occurred while presenting it to a participant, who questioned the role of AI in facilitating collaboration. This feedback highlighted the significant omission in the design outcome, compelling for a refined approach. By focusing on a clear problem statement “How can AI assist in collaborative planning?” the process became anchored ultimately leading into the chat format-design.

The initial attempts consisted of designing the flow of onboarding and adding saved social media posts for a personalised itinerary to begin with and choosing the location and ideas around how that can be streamlined. The main intention with using social media saved posts as a channel for inspiration was to enable end users to influence the ML-generated suggestions based on their own interests. Some of the shortcomings that have been noted for AI products include bias and irrelevancy in data and unreliable results. To address this issue, the idea was to enable users to create their pool of data from social media.

For the next attempt, a journey map was created with 2 different personas for the scenario of them travelling together. Instead of the entire journey the focus was on choosing an accommodation. This was also what most of the participants emphasised on being particular about and was a matter of discussion in the auto-ethnographic observation in terms of the budget and facilities and view. The ideation phase involved thinking about ways in which an AI assistant would help to navigate difference of choices in an unbiased manner. This led to the chat-based approach as seen in the image.

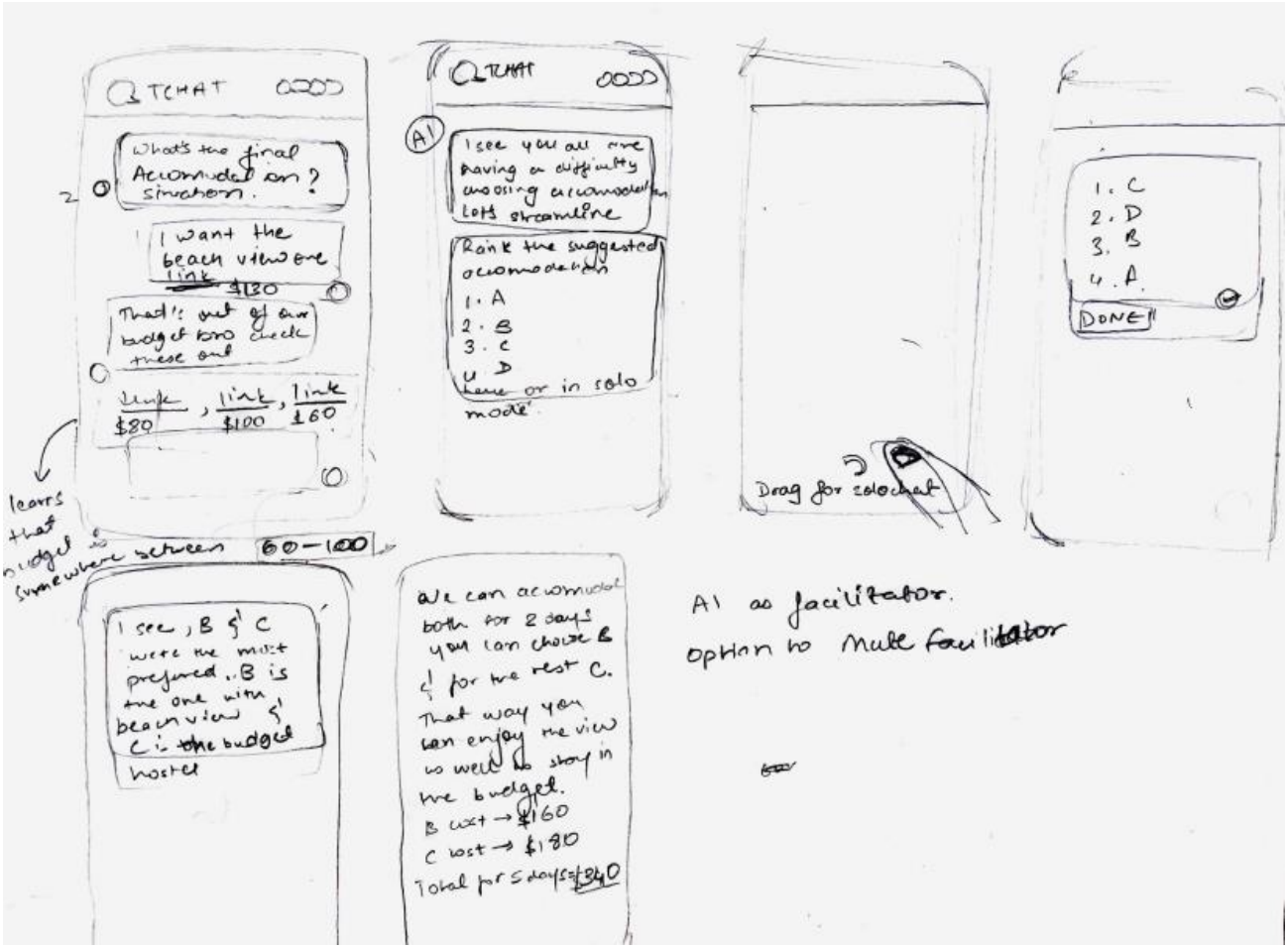


Figure 24 Ideation sketch of a chat-based approach.

5.2 Wireframes

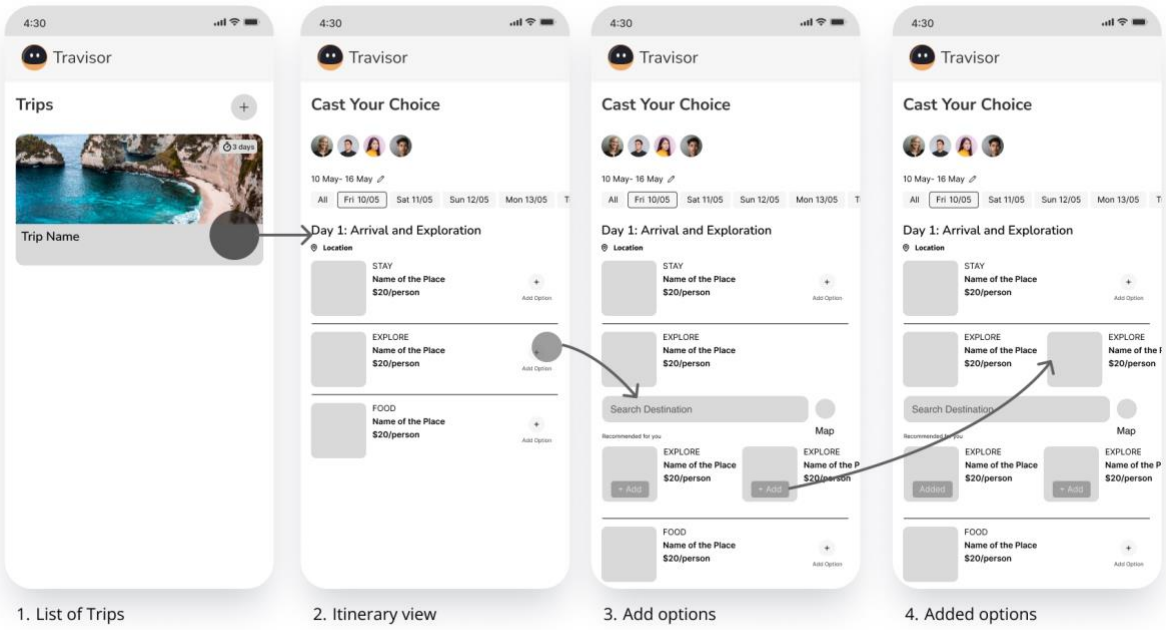


Figure 25 Adding options for places initial attempt.

The first screen outlines the design for list of trips as a user can plan more than one trip. Upon selecting a trip, the user would land on a recommended itinerary. (note: it was considered that the user already undergone the process of creating recommended itinerary). The goal was to design a user-friendly interface for enabling users to add more than one option through exploring. In the initial design, the search feature expanded on the same page below the destination as seen on the last two screens. However, that that seemed to clutter the screen unnecessarily with a higher risk diverting the users focus from

the primary task.

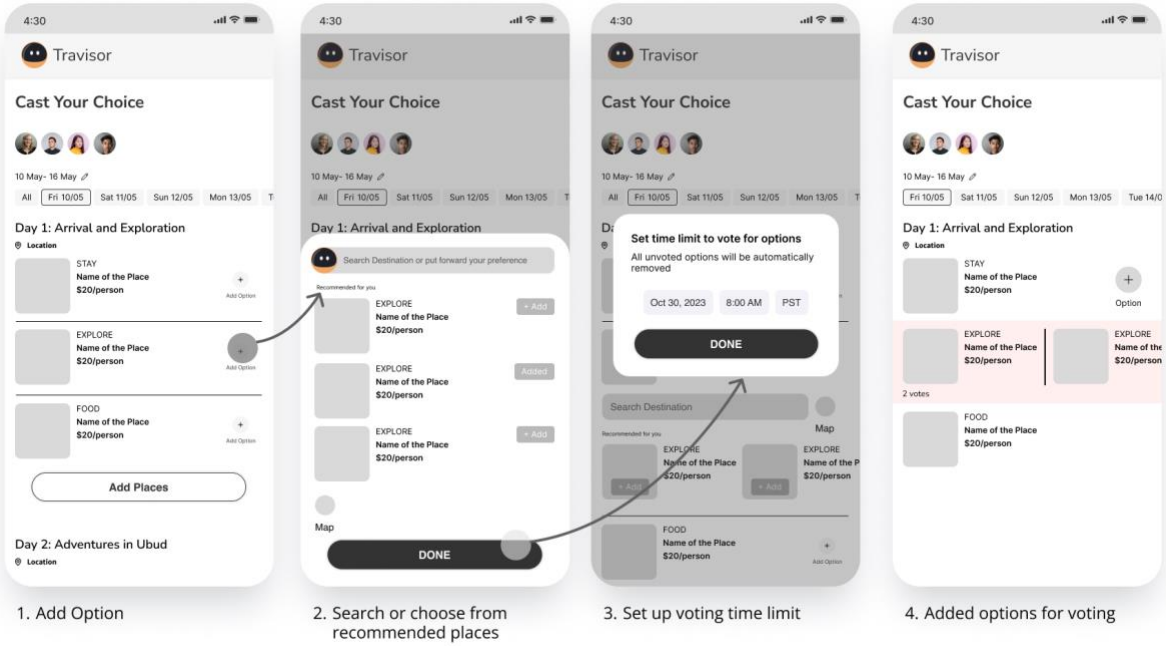


Figure 26 Adding options for places revised for a better experience.

Hence, this flow was reimagined with a drawer. Wherein upon clicking “Add Options” the users would be able to search and explore through a range of options without any distractions in a drawer and easily add these options. The drawer also assures the users, that they can easily access the itinerary just by tapping out. Upon adding the options, a reminder to set time a limit to vote between options pops up (screen 3). This would help users to effectively decide in each timeframe. The last screen is a representation of multiple options and votes once users have undergone the adding process.

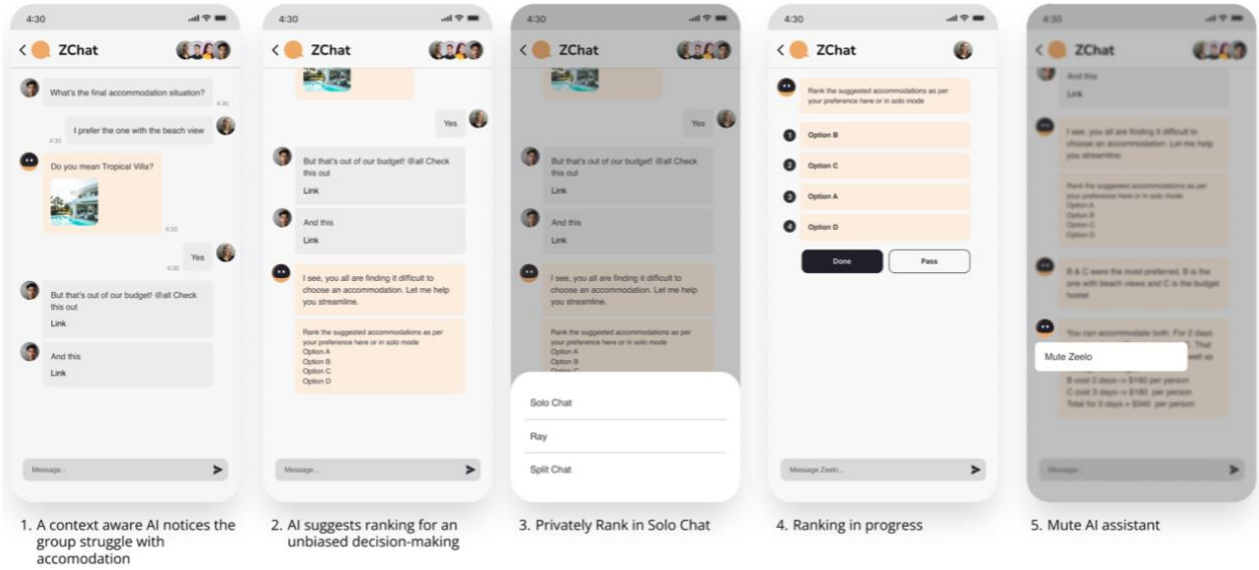


Figure 27 Feature considerations for a chat-based solution: AI-facilitation for choosing accommodation.

These are the wireframes for a chat-based flow of AI- facilitating to decide accommodation. In this scenario the AI-suggests users to rank the shortlisted options to reach a consensus. The features and interactions that were thought of include allowing users to rank privately which is seen in screen 3 and 4. Another feature consideration was for muting AI seen in screen 5 when users do not want the AI to interfere in some conversations.

5.3 Final Concept

The final concept is a set of features and user flows that focus on the insights obtained from this study. These cater to the following three areas:

1. Personalising the itinerary recommendations for the group using AI, based on shared social media posts by individuals.
2. Ease of modifying itinerary by adding, removing, or reordering travel destinations.
3. AI-facilitating decision making for navigating complex conversations.

Relevant Recommendation

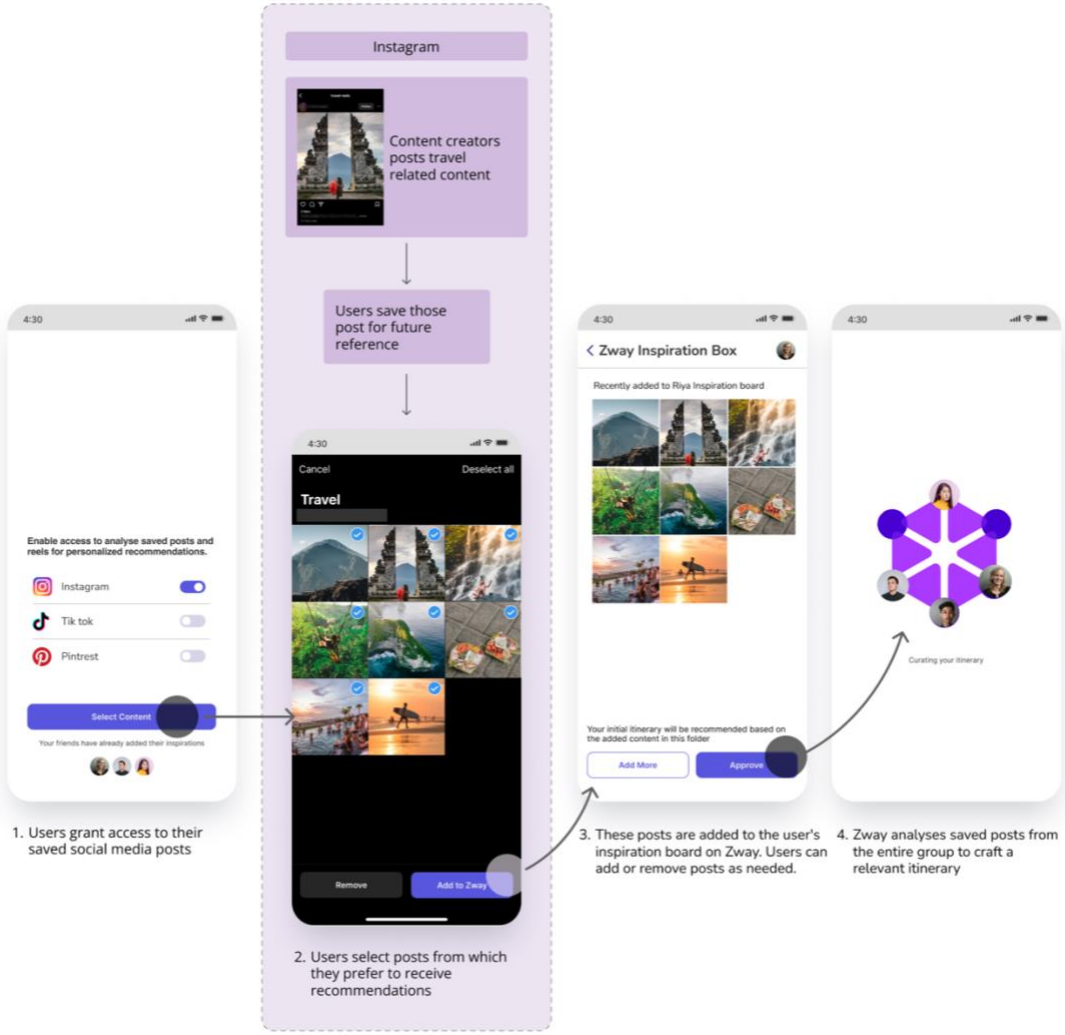


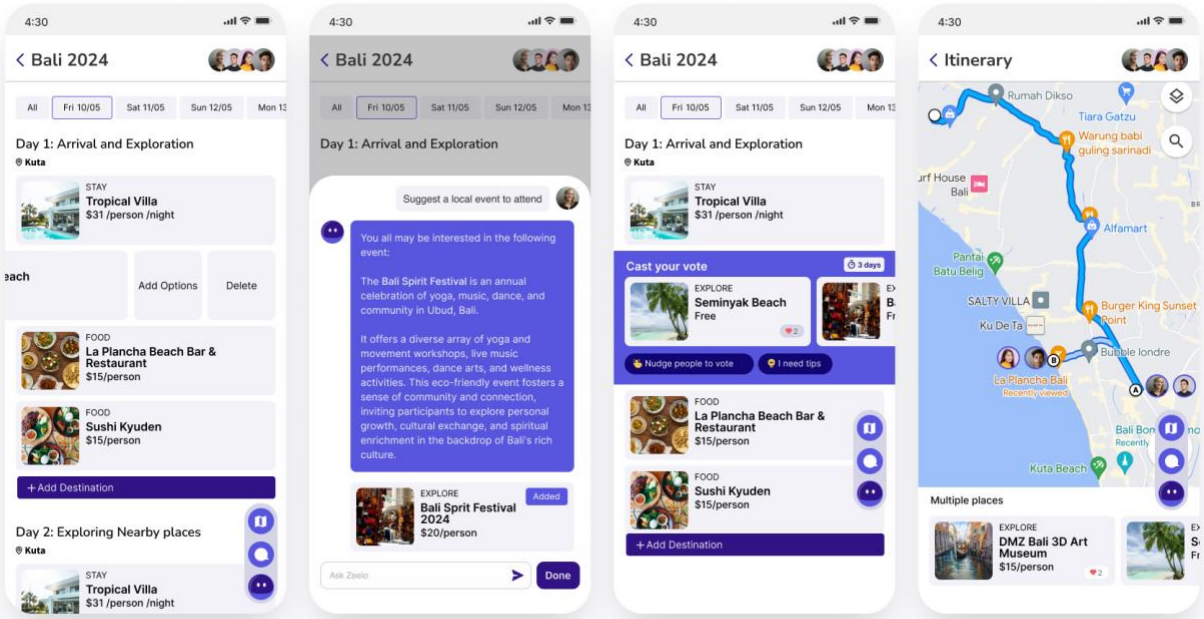
Figure 28 prototype design representing flow for relevant itinerary generation.

[Link to view prototype]

As per the insight's the users wanted hyper personalised recommendations and consideration of diverse perspectives of group members. With AI, personalisation of the output depends on the accuracy and relevancy of data. Since, the findings from the participatory research revealed that for the participants, social media already acts as their primary source of inspiration; therefore, leveraging data from content creators of social media to create a personalised itinerary would streamline the planning process. By integrating the social media access feature, the aim was to align with established user behaviour rather than introducing additional, unfamiliar steps. As depicted in the figure,

once users grant permission, they can select specific saved posts of other content creators that they find inspiring. These posts would be saved in a personal folder that can be modified by the user as needed. Once all the users upload their inspiration boards, the application then analyses these posts using NLP (Natural Language Processing) techniques and vision algorithms. The AI system learns what types of destinations, activities, or experiences are commonly preferred among the group and suggests similar options. The core ML component would be a hybrid recommendation engine. It would use multiple methods like content-based filtering, collaborative filtering, knowledge-based, and social media-based recommendations, to process this data from a vast dataset (source not defined but could be authorised and user consented google reviews, booking apps like Expedia, Booking.com, TripAdvisor, destination site, etc). A hybrid recommendation system with a weighted influence from the added social media posts of users over other data would be more effective as it addresses the limitation of individual methods. This would eventually create a personalised itinerary for the group.

Collaborative Planning



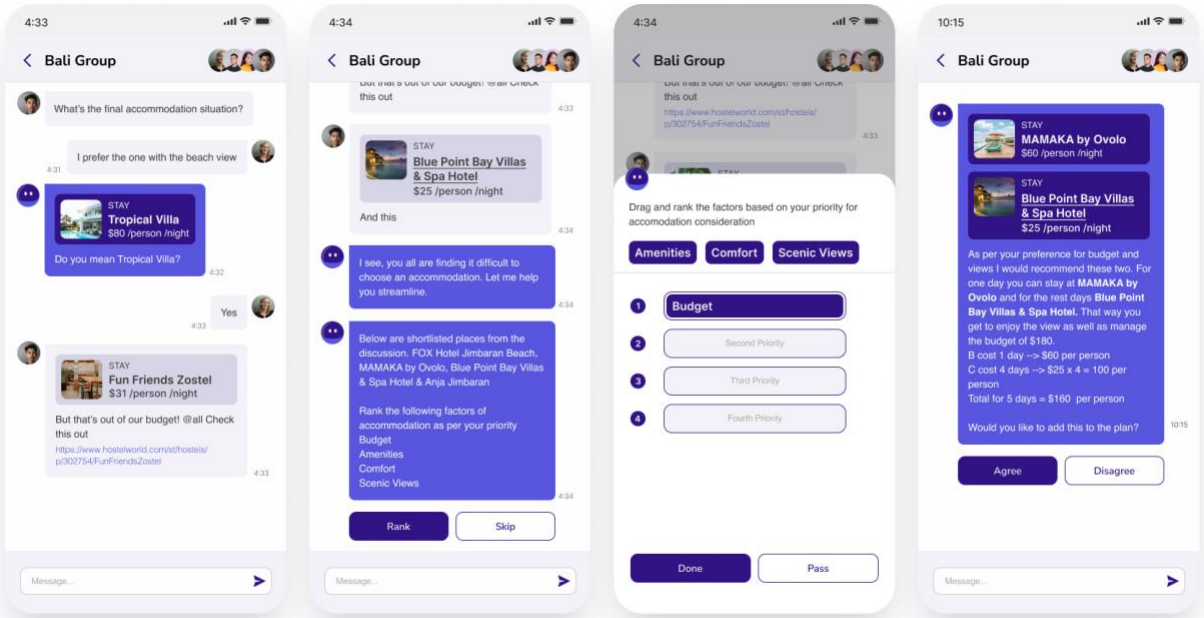
1. A quick way to swipe and add options
2. AI recommended personalized options
3. Ease of adding options for voting
4. Multiple option consideration for diverse preferences

Figure 29 Features for ease of collaborative planning.

Link to view prototype

The itinerary generated with multiple recommendations can act as a starting point for the group to further collaborate and iterate according to preferences. This collaborative planning includes the ability to add, choose, and vote on shortlisted options. The search encompasses AI-powered personalised recommendations along with the typical manual search. Users can easily add or remove locations and seamlessly rearrange them within the itinerary. The interactions are designed keeping in mind the current behavioural trends to minimise the learning curve. Additionally, a map view is available to facilitate the planning process, allowing users to visualise and coordinate their chosen destinations with ease.

AI-Facilitator



1. A context aware AI notices the group struggle with accommodation
2. AI suggests ranking their factors of consideration for an unbiased decision-making
3. Private ranking enabled for group members
4. AI facilitator suggests a best possibility based on the ranking

Figure 30 Screens showing AI-chatbot facilitating group discussion for deciding accommodation.

Link to view prototype

The comparative analysis findings show that while people are willing to plan, they are seeking digital tools that simplify the group planning process altogether. As texting was identified as the most favoured means of communication from primary research, it would make sense to choose an AI-powered chat feature to significantly enhance the planning process. Not only can it provide recommendations for places based on the past conversations but can also facilitate decision-making, promote diversity of opinions and equal participation to resolve conflicts. As per the insights, making an unbiased decision would involve consideration of diverse perspectives. With the capability of sentiment analysis AI would be able to consider diverse perspectives from an emotional lens, recognise the tone of conversation, and promote equal participation (Kim et al., 2020).

The above screens are designs for the application are representative of the **Scenario of navigating conflicting thoughts regarding accommodation** discussed in section 4.3. A

context aware AI chatbot called Zeelo, helps to decide for the most favourable accommodation. The participants encountered a disagreement about accommodation choices, specifically concerning budget, amenities, and views. One person in the group preferred to economise on accommodation, opting for a less expensive stay. In contrast, another individual prioritised comfortable stay with facilities and a scenic view. The algorithm being trained on materials with best approach for to navigate group decision-making for trip would suggests ranking from the identified factors concerning users for choosing an accommodation option in this example. In a real case, it would depend on multiple factors like historic conversations of the users, shared inspirations, conversation dynamic based on which AI will analyse and suggest a suitable approach.

5.4 The Working Explained

This diagram, typically called a System Architecture Diagram, describes how the technological aspects of the project work together to create the user experience.

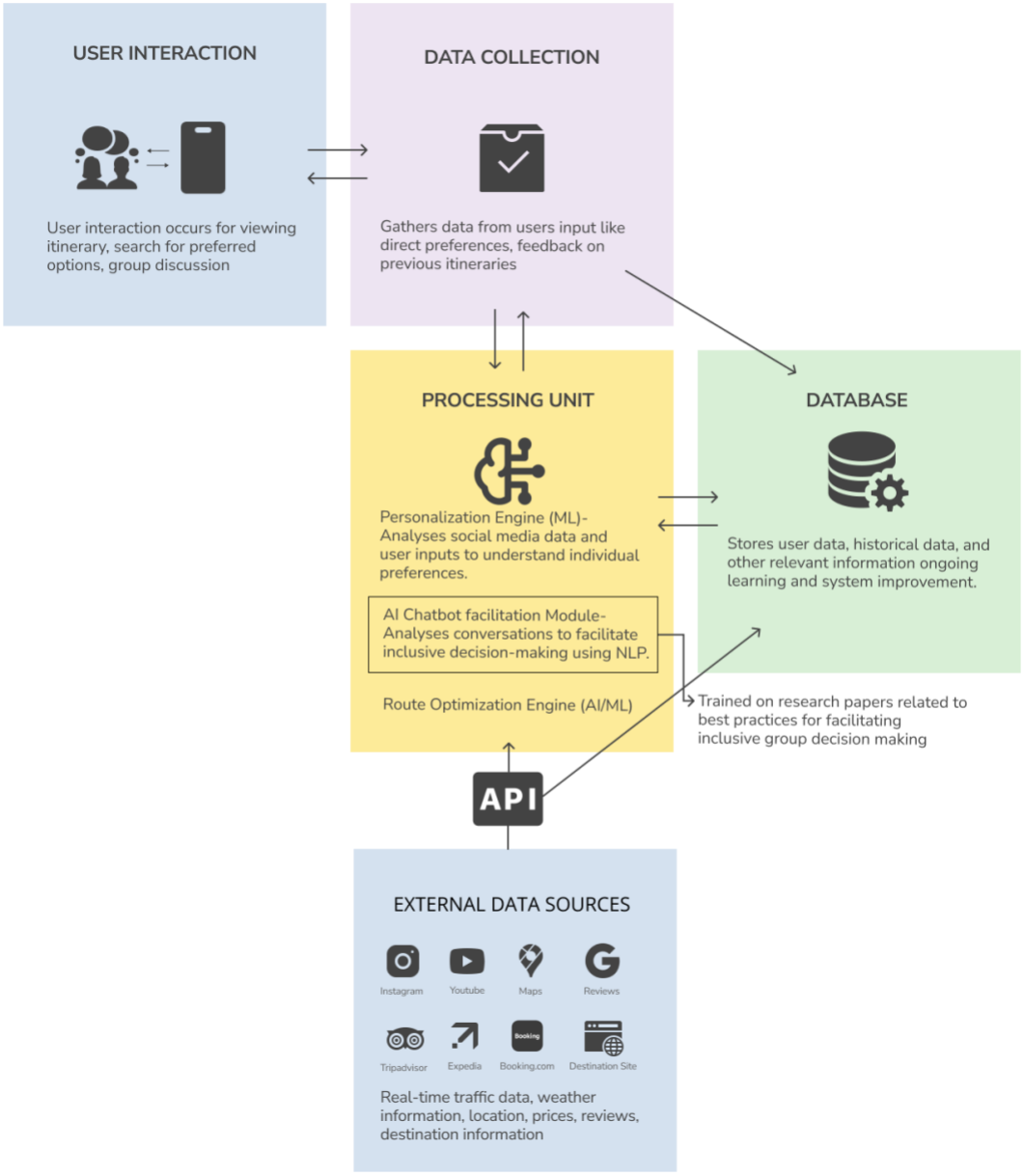


Figure 31 System architecture diagram.

5.5 Testing and Iterating

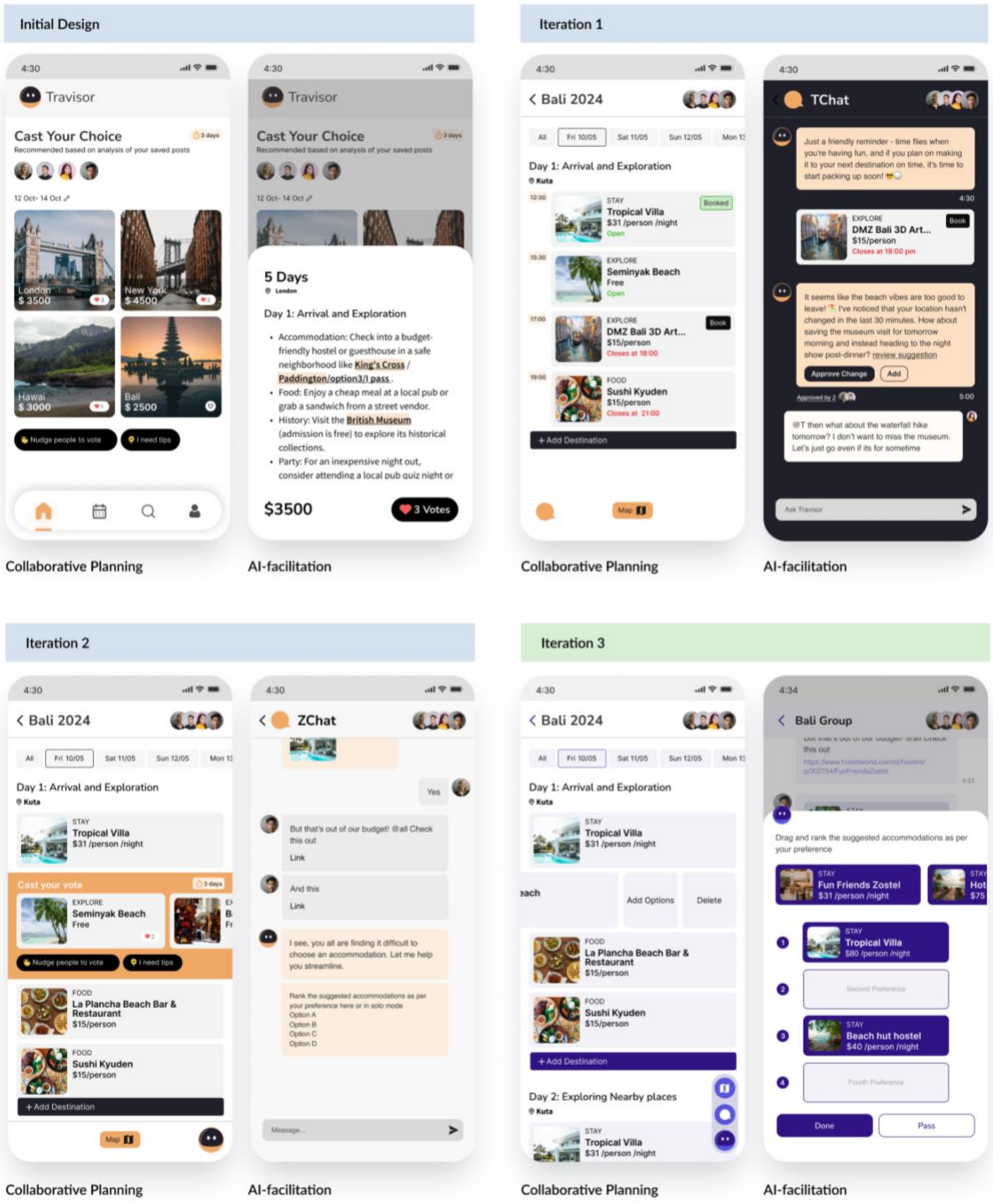


Figure 32 iteration screens of collaborative panning and AI collaboration.

Testing was carried out multiple times as part of this study, and changes were made to the features and user flow in response to feedback. Users were given an overview of the solution and were instructed to think aloud while testing. This served as a research method as well and yielded valuable insights on the user flow. In the initial 2 rounds the users were having a tough time figuring out the flow and the concept seemed unclear. The main query revolved around the role of AI in facilitating. Thus, the third iteration explored a chat-based approach using a relatable scenario for selecting accommodation, which was highly appreciated by the users. The feedback on this concerned whether it was possible to stop suggestions while travelling? This led to the consideration of an important feature to mute or pause the AI assistant whenever the interference is not pleased.

Six people volunteered to interact with the final prototype at the open studio event where it was displayed. The overall response with using AI for group trip planning was positive. Majority of them were intrigued by the solution and showed curiosity towards a full experience. While the initial idea was validated before, the final testing allowed for the validation of the comprehensive concept consisting of the user interface and features. Some individuals suggested extending the app's capabilities to incorporate a more extensive range of digital functions for travel in groups, like photo sharing, cost splitting, and booking.

However, adding these may drift away from the core focus of the app, which is to assist in decision-making among a group. When an application tries to do too much and shifts from its primary intended use, it becomes less effective. Hence, no changes were made in this regard.

6. Reflections and Future Directions

6.1 Reflection on the process

Overall, the iterative design process of constant testing and refining proved to be effective, with rapid identification and design revisions. However, it is important to note that the autoethnographic findings are likely to be influenced by researcher's unconscious biases, limiting their generalisability beyond this study.

Narrowing the focus by defining the users and challenge of group travel planning, the solution became tailored, and complexities of AI-driven systems were unpacked. Though the idea and the user flow were validated with designs, a thorough testing of AI-based design concepts can only be achieved with a functional model. The rationale is that for AI models to become accurate, considerable training and testing are necessary. Therefore, the concept's potential could not be completely evaluated unless that was adhered to. Also, since the participants for this study were limited to ECUAD students, the solution cannot be assumed to work for everyone unless tested with a wider audience. In the proposed solution the frequency of the AI assistant interrupting the chat, identifying a conflict vs discussion, accurately streamlining a suggestion are all aspects that can only be tested with a functional model. Hence, a key insight from this study points towards the necessity of concurrent design and the development process to efficiently test chat-based AI assistant products.

6.2 Designers and AI

This study also identifies a need for designers to have a deeper understanding of how AI works. This is essential because AI directly impacts the experience users have with a product. Interaction of humans and AI can be studied through observations or interviews.

However, it is challenging to curate an experience being unaware of the actual capabilities and limitations of AI.

A general trend observed in the emerging Generative AI based applications for content creation, travel planning, schedule planning is the reliance on prompt-based approach. This can be an opportunity where designers can contribute by enhancing the user-friendliness and extend the possibilities of these applications to meet the needs of users. Understanding AI will empower designers to refine user flows and identify key tasks that can be seamlessly integrated into features instead of mere prompts. Just like in Adobe Photoshop a frequent task of removing or extending background is an AI feature along with the ability to edit based on prompts.

The most popular tool for UX designer which is Figma is also seen to have AI based plugins for many tasks like ideation, mind mapping and converting designs to code. The progress and constant upgrades with AI, makes it apparent that soon design prototyping tools that would emulate AI functionality would be required for UX professionals to test AI-driven experiences.

6.3 Future Directions

Another revelation that emerged clearly during the study was the demand for AI based solutions. People wanted ease of access to information and the free AI license has led to the widespread adoption across various domains including using ChatGPT and Bard for travel planning. An influencer promoting Bard demonstrated the usefulness and simplicity of these technologies by asking for customised trip recommendations for Ahmedabad, a city in Gujarat. The public's rising predisposition towards AI assistance was further reinforced by the positive response in the influencer's post's comments section.

It cannot be denied that humans and AI working together can be unbeatable. For instance, AI can process large amount of financial data and provide options for reliable investments. Yet, humans with their intuition, expertise and market understanding can identify right options. Similarly, for travel AI can help with hyper personalised recommendation and decision making given the accurate data. In case of travel planning AI-based products users demand relevancy and accuracy of recommendation, which can be achieved only with precise data given to algorithm. So, in the case of Zway as well the user experience as much as it is dependent on AI is also dependent on the users themselves and the way they interact. The design experience can be refined based on feedback, however moulding the generative AI experience will be driven by users.

The reason why AI can provide accurate output is because it has access to abundant resources and its infrastructure allows to process through multiple layers. However, this capability comes at a significant environmental cost, as AI operations, both during usage and training, consume substantial amounts of power. In addition, the open license has led to an increased experimentation and usage. Hence, looking at sustainable ways of training and using AI as well as responsible usage of AI would be crucial to lower the environmental impact and ensure its long-term viability.

6.4 Ethical Considerations

Having known that data is the main force driving a product like Zway, which is a subject of concern for all users, building the algorithm with an ethical approach in compliance with lawfulness and considering all the anticipated risks is a must. While providing a practical solution it is imperative to ensure the users' privacy is uncompromised. In the context of users saving posts from content creators to use in a dataset it is essential to take consent from the creators as they are owners of the data. This can be achieved by informing the content creators about the use of their posts for AI data sets and giving them the option of sharing anonymised data excluding any personal information. Enhanced techniques of

data masking can be employed to anonymise user data while preserving its utility for AI training. This approach could serve as opportunity for content creators to monetize without compromising their privacy. They could set a price for their own data for allowing other people to use their data on Zway or they could be paid by Zway while a fee is charged from the users. This would also overall enhance the usefulness of the saved posts feature on Instagram while benefitting the content creators and the users.

It would be imperative to obtain consent and credit the relevant researchers whose work towards recognising best practices for facilitation and decision making are utilised for training the chatbot. The implied approach would be to filter through biased data before using for training however, complete elimination of bias is still a challenge. Hence, it would be crucial to inform the users about the potential biases in the output. The part where users are chatting in group chat with AI, they could be sharing their personal thoughts, preferences, and sensitive information. Again, a consent for allowing AI to store, analyse information and provide suggestions based on that is a must (GDPR). Setting guardrails for AI to limit the analyses and facilitation to travel planning related conversation would be essential to maintain users' privacy and as a respect for human dignity. Additionally, transparency about the process and letting users own their data would be essential to gain users' trust. Though these are aspects which can only be tested and refined after extensive training, they are noteworthy to be thought of. On top of the ensuring the user privacy and security, a legal compliance would be another must while building this application.

Zway being an AI driven application would use users' data for providing hyper personalised and relevant recommendations hence it would be essential to prioritise user consent, transparency, and legal compliance to ensure ethical handling of users' data.
All in all, the insights from the research emphasise the need for a structured approach in AI-assisted collaborative trip planning and the importance of aligning design practices with emerging user preferences and technological advancements.

7. Conclusion

In conclusion, integration of AI and human intelligence can lead to superior outcomes compared to what each could achieve individually in terms of collaborative group trip planning. AI's significant positive impact in the realm of remote work collaboration through automating tasks, aiding in business decision making, tracking progress, and simplifying search foreshadows its potential in group trip planning. Particularly, AI can assist with group decision-making, search result personalisation, itinerary automation, and route optimisation. The continued ethical advancement and improvement of AI technology point to a promising future for the practical and safe use of the concept discussed in this study.

Currently, most applications focus on individual trip planning. However, a transition towards applications for collaborative trip planning is anticipated given rapid advances in AI and emerging needs. It is established that one size doesn't not work for all even with AI products. To address the unique needs of the defined users in this study, travel-related AI-chat models must be improved and customised beyond the general search models now in use. Users in this case looked for ease and efficiency in planning with hyper personalised results and assistance in asynchronous collaboration. Therefore, AI's use in group trip planning was well-positioned to satisfy these needs, providing innovative solutions for these users that value personalised experiences and convenient collaboration. Since, personalisation includes utilising users' data, hence accounting for ethical measures becomes a paramount consideration.

Furthermore, the nuances of designing with AI and gaps in process are identified through this study. This equips designers to better understand the points of user's interaction with AI and anticipate the flows. Though the user flow and the idea can be tested with design

prototypes however, most of the user experience which involves AI interaction can only be tested with ML enabled prototype.

Therefore, this study not only contributes to our understanding of AI's capabilities in the realm of travel but also serves as a roadmap with actionable insights for designers to navigate a user centric AI-driven experience.

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Appendices

Comparative Analysis

Attributes/Apps	Troupe	Mitravel	Wanderlog	Tripit
Value Proposition	PLAN GROUP TRIPS WITHOUT THE HEADACHE.	Reimagine group travel planning!	Build, organize, and map your itineraries	TripIt helps you keep track of your flights, hotels, car rentals, confirmation numbers, and other details–all in one place–so you do not have to search through multiple emails or apps to find what you need.
Est Date	2020	2021	2019	2006
Ratings on App Store	26 Ratings	Not launched on App store	500K+ downloads & 9.99K rating- Googleplay 1.3K rating- Apple store.	76.7K(Googleplay), 243,881(Apple)
Key Users	Any travel groups	Travel enthusiast	Travel Planner	Frequent Travellers
Tone & Copy	Clear and Crisp	Fun & Friendly		Friendly & convincing

User Reviews	“The entire family is onboard, it’s one central place to put everything and get out of group text chains...”- Derek G. Columbus, OH, “When I sent this app to people, they felt more confident and onboard with the trip because Troupe was so organized.”- Dondré T. Los Angeles, CA , “We’ve gotten more done in the last 2-3 days with Troupe than we have since March trying to plan this on our own.”- Daphnee M. Reading, PA	Not available	"This is a fantastic app for planning complex journeys in a wide region. It was easy to add points of interest, and seeing them all on a map was immensely helpful. I loved being able to group them into itinerary days. And having all the flight and hotel details in one place was super useful! Worth pro to take it offline for the duration of the trip.""Updated, back to 2 stars. The core is great, I like the integration with Google maps and routing. But there are annoying things like it will not route to/from airports/hotels even though they get marked on the map. The design looks nice in pictures but it's unclear in use, there's no clear delineation between sections it's all shades of grey."	"Helpful in many cases but may get confusing if you change bookings" "Two basic functions done well; the rest of the app is unimpressive" "I travel often both for business and with my big family. This has been a game changer."
Good Features	Inviting friends to plan together. Poll & voting for decision making.	Planning board, Polling feature, AI Assistant for bookings	Itinerary, Map view, downloadable	Live updates and notification about events

	Explore with AI along with a map. Feedback on the experience.			
Poor Features	Add the links and suggestions manually. No time limit on voting feature.	Board view on a mobile	Poor UI and navigation	Doesn't allow group planning for free
Pricing	Free	Free-1 trip, 2 editors $25/trip-5 editors $12/month	$5.33/month or $63.99/year	$50/year
Design	Easy to use. Too many clicks to navigate and plan		Poor UI and navigation	Edit option in Organe colour completely different from CTA. Lacks essential functions like duplicate
Strengths	Heavily invested in simplifying Group Travel	Collaborative Planning on board	collaborative itinerary	Great App to remind flight and reserved options.
Weakness	Explore feature using AI and planning with groups are fragmented experiences	disorganised and difficult to track, No flow	overwhelming and too many features	Not collaborative