

**Part 01: Process Understanding**

**1. Understanding User Needs Phase**

The first and most foundational stage of the UX Engineering process is understanding user needs, as this establishes the direction for every design and development decision that follows. In order for the user experience to meet expectations, we must begin with empathy. Genuinely seeking to understand users using tools such as empathy maps and employing research methods such as user interviews and surveys. Without empathy, we cannot understand the real needs of our users, and such we may end up creating an unnecessary or irrelevant product [1].

This involves more than simply identifying who the users are; it includes what the user wants to achieve, what challenges they face, what motivates them, and how they want to feel while using the system. With methods like user interviews, teams will be able to gather real insights into user goals and pain points, requiring them to be able to empathize with those they interact with. These findings can then be distilled into personas and user journeys, which serve as the empathetic design vessels that represent the needs, behaviors, and experience of different user types. Empathy goes a step further and extends to stakeholder engagement, workshops and collaborative discussions with both internal and external stakeholders and other parties will help surface broader expectations and constraints. Without empathy, the entire product risks being built on misinformed decisions, leading to poor usability, disengaged users, and ultimately failure to meet user and business goals. Empathy and understanding our user are crucial to a human-centered design process [2].

**2. Collaboration & Communication Phase**

Collaboration and Communication is the second stage, which ensures that insights gained during the initial research phase are effectively exchanged between both designers and engineers, ensuring that not only do design choices meet user expectations and needs, but are technically feasible. This phase bridges the gap between disciplines, bringing together designers, developers, stakeholders and others to align on user needs, project goals and technical feasibility.

A core activity here is fostering collaboration by establishing cross-functional teams. These teams allow individuals with diverse perspectives and expertise to contribute to the process, preventing siloed thinking and improving overall quality of decision-making. Encouraging open communication channels is essential at this stage, as it facilitates sharing ideas, feedback and concerns, which reduces misunderstandings and keeps involved parties aligned. K. Tabe expresses the crucial importance of collaboration between UX designers and engineers in order to create successful products [3].

### 3. Designing for Human-Centeredness Phase

Designing for Human-Centeredness brings the fruits of the first two phases and implements them into real, user-focused design solutions. This phase is guided by principles of design thinking, which emphasize empathy, creativity, and iteration. Implementing design thinking methodologies allows teams to develop solutions that are intuitive and aligned with users' expectations by focusing on understanding real-world needs.

Human-centered approaches ensure that the product prioritizes the user, fulfilling the needs of the user as researched in the first phase, with clear communication from the second phase fostering well-aligned ideas that are turned into tangible designs. Here, designs implemented consider different cultural backgrounds and are iterated based on user feedback, ensuring that the designs align with user needs and expectations. The five stages of design thinking cycle through empathize, define, ideate, prototype, and test [4], allowing designers to make continual improvements and ensure that each version of the system better reflects user needs. This iterative cycle not only helps uncover usability issues prior to deployment but also strengthens the connection between the product and the people it's being built for.

### 4. Implementation Phase

The fourth phase is where the design concepts and prototypes from the third phase are transformed into a fully functional product and shipped. This stage marks the transition from design to development and requires close collaboration between designers, developers, and other stakeholders to ensure that the product stays true to the original user-centered vision. One of the key strategies employed is the adoption of agile development methodologies. Agile strategies enable teams to remain flexible, iterate quickly, and adapt to feedback throughout the development process, essential in maintaining alignment with evolving user needs.

In addition, teams regularly meet to review and reassess project goals, ensuring that the system continues to meet expectations and incorporates new insights gathered during implementation. This responsiveness assists with mitigating risk, avoiding costly misalignments between design intentions, technical executions, and faulty launch products [5].

### 5. Continuous Improvement Phase

Continuous improvement is the final phase, but unlike earlier stages, this phase is continuous after product launch. This stage acknowledges that user needs, technologies, and business goals are not static, incorporating establishing feedback loops that allow teams to collect ongoing insights from users after the product has been released. These insights are then regularly reviewed and analyzed to identify opportunities for refinement, whether that involves fixing usability issues, enhancing performance, or adding features that better support user goals. This phase is vital as it prevents the product from becoming outdated or misaligned with constantly evolving user expectations and technological developments and trends.

Without a clear process for ongoing evaluation, issues may go unnoticed, resulting in user frustration, reduced engagement, and missed opportunities for innovation. By maintaining a culture of reflection and iteration, teams establish a continuous improvement cycle, creating good design [7].

## Part 02: Reflecting on Users

1. Imagine you are building an app that improves the public transportation experience for urban users, making it easier for people with varying schedules, purposes, and preferences to navigate, plan, and use public transport more effectively. Which details in the Alex Singh persona would inform the design of your app? Explain how they would affect the design?

One of the most relevant details in Alex's persona is that they moved from a small town to a city. As someone who has experienced that same transition to a large urban environment (Seoul, South Korea), I know how overwhelming city infrastructure can be. For someone like Alex, who is now navigating a more complex transport network, the app should prioritize simplicity and clarity. Features such as a straightforward way to input starting points and destinations, using clearly labeled fields such as "STARTING POINT" and "DESTINATION" would reduce confusion. The app should also provide visual support, such as color-coded route maps, where different transport types (e.g., bus, train, ferry) and different subway lines/bus routes are well distinguished. This allows users to quickly understand their options at a glance.

Another detail that stands out is Alex's active lifestyle, with interests in hiking, biking and running. While this may not directly influence user daily commuting needs, it opens up opportunities for the app to support recreational transport planning. Including commonly visited outdoor destinations like hiking trails, scenic walking areas, or biking routes (e.g., Wellington's Oriental Parade or Mount Victoria tracks) in the location search or as recommended destinations can enhance the app's versatility and appeal to users with active lifestyles like Alex. Additionally, users who are active outdoors may find themselves in situations where lighting conditions and screen brightness affect interaction ability [13].

Additionally, Alex is a highly organized and goal-driven individual who values efficiency. This suggests that the app should support advanced route planning features such as travel time, real-time delays, and integration with external applications such as being able to share data to and from health apps [10]. A clean and minimal user interface with potential for highly customizable options like frequent routes or preferred transport modes would also align well with Alex's preference for streamlined processes. Their interest in technology and learning also supports this, suggesting that they'd appreciate optional advanced features with further customization, such as transport data visualizations or setting personal travel efficiency goals. This would enhance user engagement without overwhelming less tech-savvy users.

2. What additional details would you need to know about the Alex Singh persona for it to be a more relevant representation of users of your app?

To better understand how Alex would use the app, I would need more information about their current commute habits. For instance, do they rely on public transport for daily commuting to work, or do they primarily drive or bike? Do they drive to a train station before taking the train and then transferring to a bus? Knowing how frequently Alex uses public transport and for what types of trips would help prioritize features.

Another detail that would be helpful is Alex's behavior and preferences, as well as fluency in digital technologies. For example, what types of apps they typically use, their comfort with mobile technology, and whether they prefer receiving updates via push notifications or browsing

within the app. Regardless of a user's digital capabilities, accessibility means information and usability is available to everyone [13]. This would help determine interface complexity, notification preferences, customizability, and potential integration opportunities.

Further, understanding accessibility needs or any pain points they have experienced with public transport in the past (e.g., poor signage, unreliable schedules, already-full vehicles) would guide design improvements [7]. Details about language preferences or familiarity with digital maps could also be important, especially for users who are new to urban systems or have limited digital literacy.

3. List all stakeholders relevant to your app that you would need personas for and explain why they are relevant?

Daily commuters would be the first and most important user persona as they are users who rely on public transport to get to work or school. They will need efficient, reliable routing and real-time updates, as well as schedules, routes & pricing [7]. It would be suitable to say that the needs of daily commuters shape the core functionality of the app.

Tourists and newcomers are also important as they are generally first-time users of the app. People unfamiliar with the city (like Alex once was), require clear navigation, route discovery, multilingual support and simplified interfaces. Tourists may be short-term users, "driven to 'enjoy as much as possible' in a limited time" [12], their perspectives helping clarity, efficiency, and usability .

Transport operator personas represent drivers, station staff or system managers. They help inform how data (e.g., delays, route changes, etc.) is shared and integrated into the app, which is vital for backend functionality and accuracy.

Accessibility-focused users include personas who use wheelchairs, have visual impairments, or cognitive differences to ensure that the app is inclusive and safe. Their perspectives guide UI design (e.g., contrasting colors, font choice, size, weight, etc. [13]), voice support, tactile feedback, and route accessibility data. [8]

Parents or caregivers are also important. These users may overlap with the above archetypes, but may be navigating transport while managing strollers, children or dependents and at the same time balancing care and work responsibilities [11]. Their persona would prioritize child-safety features, multi-stop planning, and family-friendly alerts [9].

## References

- [1] “What is the UX Design Process? 5 Steps to Success” Interaction Design Foundation. <https://www.interaction-design.org/literature/article/ux-design-process-guide> (accessed Mar. 19, 2025).
- [2] “What Is Empathy and Why Is It So Important in Design Thinking?” Interaction Design Foundation. <https://www.interaction-design.org/literature/article/design-thinking-getting-started-with-empathy> (accessed Mar. 19, 2025).
- [3] K. Tabe. “The Art of Collaboration: How UX Designers and Engineers Can Work Together Effectively.” Medium. <https://medium.com/design-bootcamp/the-art-of-collaboration-how-ux-designers-and-engineers-can-work-together-effectively-16a28620d3b3> (accessed Mar. 20, 2025).
- [4] “What is Design Thinking?” Interaction Design Foundation. <https://www.interaction-design.org/literature/topics/design-thinking> (accessed Mar. 20, 2025).
- [5] “Best practices for applying Scrum to UX design.” Lucidspark. <https://lucidspark.com/blog/best-practices-for-applying-scrum-to-UX-design> (accessed Mar. 20, 2025).
- [6] A. Ho. “Continuous improvement in UX design.” Medium. <https://medium.com/@alan.ho/continuous-improvement-in-ux-design-a1c6a53b2c5f> (accessed Mar. 20, 2025).
- [7] W. D. Widharto. “UX Case Study: Public Transportation App.” Medium. <https://medium.com/@wahyuwidharto/ux-case-study-public-transportation-app-1fcc5a99ba10> (accessed Mar. 21, 2025).
- [8] M. Sheth. “Incorporating UX Design into Transportation Solutions.” Shared-Use Mobility Center. <https://sharedusemobilitycenter.org/incorporating-ux-design-into-transportation-solutions/> (accessed Mar. 21, 2025).
- [9] K. Menon. “User personas for a ride-hailing app.” Medium. <https://medium.com/design-bootcamp/user-personas-for-a-ride-hailing-app-3ea063a7a543> (accessed Mar. 21, 2025).
- [10] S. Houston. “UX case study – the Melbourne public transport traveller.” Medium. <https://uxdesign.cc/ux-case-study-the-melbourne-public-transport-traveller-4f01daef317a> (accessed Mar. 22, 2025).
- [11] “Transport user personas: understanding different users and their needs.” GOV.UK. <https://www.gov.uk/guidance/transport-user-personas-understanding-different-users-and-their-needs#less-mobile-car-reliant-personas-brian-and-betty> (accessed Mar. 22, 2025).
- [12] B. P. Y. Loo, “Transport geography: Towards a more people-oriented approach in the last 25 years,” *Journal of Transport Geography*, vol. 81, Nov. 2019, doi: 10.1016/j.jtrangeo.2019.102596.
- [13] “Accessibility.” Developer.Apple.com. <https://developer.apple.com/design/human-interface-guidelines/accessibility> (accessed Mar. 22, 2025).

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