

## Solution Practice 2

### Scenario: Intermodal mobility app

The software company **FutureMobilitySolutions (FuMoSo)** is collaborating with the **municipal transport authority** and several **regional mobility providers** (stakeholders) to develop a next-generation mobility platform named **PlanMyJourneyApp**.

#### **Task 1\_Solution — Identify Core User Needs and Use Contexts**

**Objective:** Understand what the system must achieve from a user perspective.

Instructions:

- Brainstorm and list at least five different user groups.
- For each group, describe their main goals and pain points the app should address.
- Identify the core use situations.
- What problems does the system actually solve for each type of user?

**Core Users** are the main types of people who will use the system

**Pain points:** specific problems or frustrations a user experiences while trying to reach their goal

**Core use situations** describe **when and how people use the app:**

- Planning the next trip at home/office before leaving.
- Checking live updates or delays while traveling.
- Comparing travel modes (car, train, bus).
- Paying once for the full trip.
- Saving favorite or frequent routes for future use.

| Core Users                                | Goals   | Pain points   | Solved by app   |
|---|---|---|---|
| <b>Daily commuters / workers</b>          | reliable, fastest door-to-door trips; minimal transfers; predictable costs.                       | delays, missed connections, crowded vehicles, ticketing across providers.   | shows the fastest route door to door (including walking parts), includes all transport types, saves favorite routes, supports multiple languages, and allows one-step payment with live re-routing. |
| <b>Occasional travelers / tourists</b>    | simple, guided planning in unfamiliar cities; transparent pricing.                                | fragmented apps/tickets; uncertainty about exact start point to the station or from the station to their final destination. | combines all modes in one place, guides walking parts to and from stations, saves routes for later, supports multiple languages, and allows one payment for the full trip.                          |
| <b>Students / on a budget user</b>        | cheapest acceptable route; student discounts where applicable with a decent duration of the trip. | cost trade-offs vs time; confusing tariff zones.  | lets users choose between faster or cheaper routes, shows cost breakdowns, applies discounts, supports multiple languages, and saves preferred routes.  |
| <b>Elderly or mobility-impaired users</b> | choose routes that are easy to walk and have elevators or low-floor buses.                        | some stations are not accessible, too many transfers, confusing payments.   | filters only accessible routes, adds more time for transfers, allows simple one-step payment, accessibility options depending on the impairment (visual, auditory, mobility).                       |
| <b>Business travelers</b>                 | arrive on time, travel quietly and get receipts easily.   | missed connections, different tickets, travel interruptions or other passengers can be noisy, making it hard to work.       | suggests quieter or first-class compartments, picks routes with few connections, balances cost and time, gives live updates, and stores all receipts together.                                      |

## Task 2\_Solution — Define 5 Stakeholders and Perspectives

**Stakeholders:** all people or organizations that have an interest or influence in the system, even if they don't use the app directly.

| Stakeholders                             | Interest  | Contribution   | Conflicts   | How to manage  |
|--|---|--|---|--|
| <b>Public transport companies</b>        | Positive<br>they want more passengers and easier ways for people to buy and use tickets                     | give real data about how people use their transport (like average capacity or routes used most), so the app can suggest alternatives when there are too many passengers. | they might not want to share company information with competitors or keep ticket prices low.          | use data-sharing agreements, clear privacy rules, and fair, competitive pricing.   |
| <b>City or regional government</b>       | Positive<br>they want less traffic, cleaner air, and better public transport for everyone.                  | they create the transport rules, give permissions, and sometimes help pay for the system.  | they need to balance environmental goals with the money available.                                    | they can support the system by giving funds or discounts to make it easier for people to use public transport.                                     |
| <b>App developers / system providers</b> | Positive<br>they want to build a good app that people like and that works well.                             | they design, code, and keep the app running safely and smoothly  | they may face limits if there isn't enough money or if some companies don't want to share their data. | focus first on the most important features and work with companies and governments to agree on what data can be shared.                            |
| <b>Users / passengers</b>                | Positive<br>they want the app to be easy, cheap, and reliable for their daily trips.                        | they use the app, give feedback, and share travel data that helps improve the system.  | users want low prices and privacy, but companies want to earn money and collect data.                 | be transparent about how data is used and let users choose privacy or data-sharing options, find a balance between affordable prices and benefits. |
| <b>Payment service providers</b>         | Positive<br>they want people to use the app to pay for their trips, which means more transactions for them. | they make it possible for users to pay safely and easily for all parts of the trip in one step.  | they may disagree about the fees they charge or who controls the payment system.                      | set fair fees and make clear agreements about how the payment system works for everyone.   |

### Task 3\_Solution — Formulate Functional and Non-Functional Requirements

things the system must do or must be

| Functional Requirements (FRs)  | Non-Functional Requirements (NFRs)  |
|--|---|
| 1. The system shall plan a door-to-door route across modes when the user enters start, destination, and time, so that the whole trip is covered in one plan.                               | 1. The system shall load route results <b>within 3 seconds</b> when a search is made, so that users don't get frustrated waiting. ( <b>Performance</b> )            |
| 2. The system shall apply user preferences (fastest/cheapest/fewest changes/accessible/quiet or first-class) when computing routes, so that results match what the user values.            | 2. The system shall work <b>correctly</b> on phones, tablets, and computers when opened on any device, so that everyone can use it easily. ( <b>Compatibility</b> ) |
| 3. The system shall show total price with a clear breakdown and available discounts when listing route options, so that users understand costs before paying.                              | 3. The system shall keep <b>running</b> even if one transport data source is temporarily down, so that users still get useful route options. ( <b>Reliability</b> ) |
| 4. The system shall offer one unified payment for the full trip when a route is selected, so that users don't need multiple tickets.   | 4. The system shall <b>use</b> clear buttons, icons, and text when showing information, so that the app is simple for all ages to use. ( <b>Usability</b> )         |
| 5. The system shall show the walking part or other short connections (walking or bike/scooters mobility) when a trip includes them, so that users can reach the station and final address. | 5. The system shall <b>update</b> live information (like delays or changes) every minute, so that routes stay accurate during travel. ( <b>Accuracy</b> )           |
| 6. The system shall send live disruption alerts and propose re-routes when an active trip is affected, so that users can still arrive on time or inform the delay.                         |   |
| 7. The system shall save and recall favorite routes/trips when the user taps "Save," so that frequent journeys are one tap away.   |   |
| 8. The system shall support multiple languages when the user chooses a language, so that tourists and locals can use the app comfortably.  |   |
| 9. The system shall provide accessibility filters and add enough transfer time when accessibility mode is on, so that trips are easier for users with mobility needs.                      |   |
| 10. The system shall generate and store trip receipts when payment succeeds, so that users (e.g., business travelers) can download them later.   |   |

**Task 4\_Solution — Prioritize Requirements:** using the MoSCoW method.

| Prioritize Requirements  |  |  |   |
|--|--|--|---|
| MUST have<br>(essential for the app to work)                                       | SHOULD have<br>(important, but can come after core features)                   | COULD have<br>(nice to have if time allows)                | WON'T have<br>(for now)                                     |
| <b>FR1:</b> Plan a full door-to-door route across transport modes.                 | <b>FR5:</b> Show walking or micromobility (bikes, scooters) parts of the trip. | <b>FR8:</b> Support multiple languages.                    | <b>Feature:</b> Voice assistant for planning and navigation |
| <b>FR2:</b> Apply user preferences (fastest, cheapest, fewest changes, accessible) | <b>FR7:</b> Save and recall favorite routes.                                   | <b>FR10:</b> Generate and store trip receipts.             |   |
| <b>FR3:</b> Show total price with clear cost details.                              | <b>FR9:</b> Provide accessibility filters and extra transfer time.             | <b>NFR2:</b> Work on phones, tablets, and computers.       |   |
| <b>FR4:</b> Offer one unified payment for the full trip.                           | <b>NFR4:</b> Use clear buttons, icons, and text.                               | <b>NFR3:</b> Keep running even if one data source is down. |   |
| <b>FR6:</b> Send live disruption alerts and propose new routes.                    |  |  |   |
| <b>NFR1:</b> Load route results within 3 seconds.                                  |  |  |   |
| <b>NFR5:</b> Update live information every minute.                                 |  |  |   |