

## **LAB 2: Problem Definition & Solution Design (Design Thinking)**

**Name:** Manoj DM

**USN:** 25BTCE118

**Course:** Design Thinking

**Topic:** Improving Bus Stop Information Using Digital Boards (Based on Survey Data)

### **Context**

Bus commuters often face problems such as:

- No information about bus arrival time
- Not knowing which bus or route is coming
- Long waiting without clarity
- Dependence on guessing or mobile phones

This lab helps understand real commuter problems using empathy and design a practical solution using **digital boards showing bus timings**.

### **STEP 1: Define the Target User**

**Task:**

Identify the bus commuters affected by lack of information at bus stops.

#### **Target User Groups (Derived from Survey)**

##### **User Group 1 – Young Commuters**

- Age: 18–25 years
- Travel Frequency: Rare / Occasional
- Digital Literacy: High
- Problem: Don't know bus arrival time
- Current Behavior: Check phone apps / Google

## User Group 2 – Elderly Commuters

- Age: 50+ years
- Travel Frequency: Daily
- Digital Literacy: Low
- Problem: No information available, don't know bus number or route
- Current Behavior: Wait and guess / ask others

## STEP 2: List Initial Assumptions

Before analyzing survey data, the following assumptions were made:

ID	Assumption
A1	Young users depend on mobile apps
A2	Elderly users struggle without displays
A3	Missing bus timings cause stress
A4	Guessing buses leads to missed trips
A5	Digital boards can reduce confusion

## STEP 3: Prepare Interview / Survey Questions

Questions aligned with the survey structure:

1. How often do you use buses?
2. Do you know when the bus will arrive?
3. What problems do you face at bus stops?
4. What do you do when information is missing?
5. Have you ever missed a bus due to lack of information?
6. What improvement would help you the most?

## STEP 4: Conduct User Interaction (Survey-Backed Inputs)

### User Responses (Examples)

- “There is no information at the bus stop.”
- “I don't know which bus will come.”

- “I keep checking my phone.”
- “I just wait and guess.”
- “A digital board would help.”

## **Observed Behavior**

- Repeated phone checking
- Looking down the road continuously
- Asking other passengers
- Visible frustration during long waits

## **STEP 5: Create Empathy Map**

Empathy mapping was created using **SAYS, THINKS, DOES, FEELS.**

### **Empathy Map – Harshith (20)**

#### **SAYS**

- “When will the bus come?”
- “I have to check my phone again.”

#### **THINKS**

- “Why isn’t the arrival time shown?”
- “This is wasting my time.”

#### **DOES**

- Checks apps / Google repeatedly
- Refreshes phone often

#### **FEELS**

- Frustrated
- Impatient

 **ADD IMAGE HERE – Empathy Map for Harshith**

(Place the Harshith empathy map image here, same position as STEP-5 diagram in Lab-2)

### **Empathy Map – Mohan Lal (52)**

#### **SAYS**

- “I don’t know which bus is coming.”
- “There is no information here.”

#### **THINKS**

- “I might miss the bus.”
- “Why is there no board?”

#### **DOES**

- Waits and guesses
- Asks other passengers

#### **FEELS**

- Anxious
- Helpless
- Tired

❖ ADD IMAGE HERE – Empathy Map for Mohan Lal

### **STEP 6: Validate Assumptions**

Assumption	Validated?	Reason
A1	✓	Survey confirms phone usage
A2	✓	Elderly face major difficulty
A3	✓	Stress reported
A4	✓	Missed buses common
A5	✓	Digital boards most demanded

## **STEP 7: Identify User Insights**

- Lack of information causes more stress than delay
- Elderly users value certainty over speed
- Young users dislike repeated phone checking
- Missed buses reduce trust in public transport

“Users are impatient”

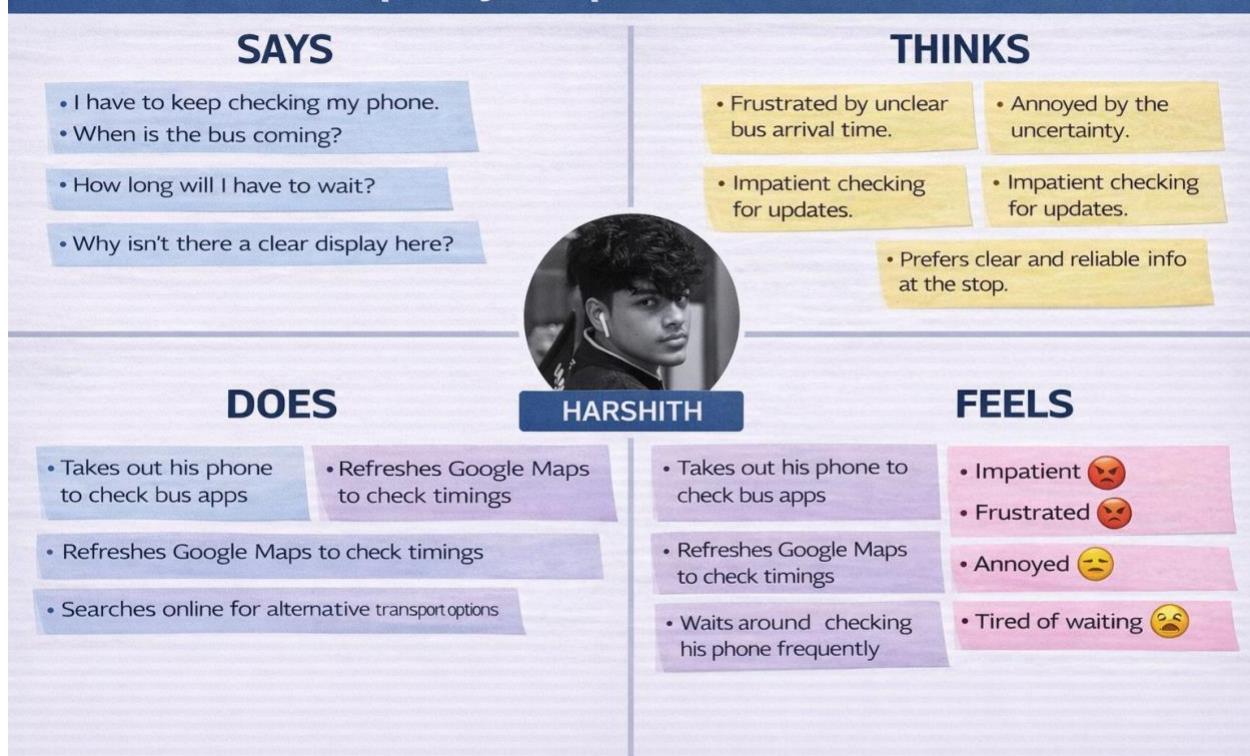
“Users feel helpless due to uncertainty”

## **STEP 8: Create User Personas**

### **Persona 1: Harshith**

- Age: 20
- Usage: Rare
- Problem: No arrival timing
- Motivation: Save time

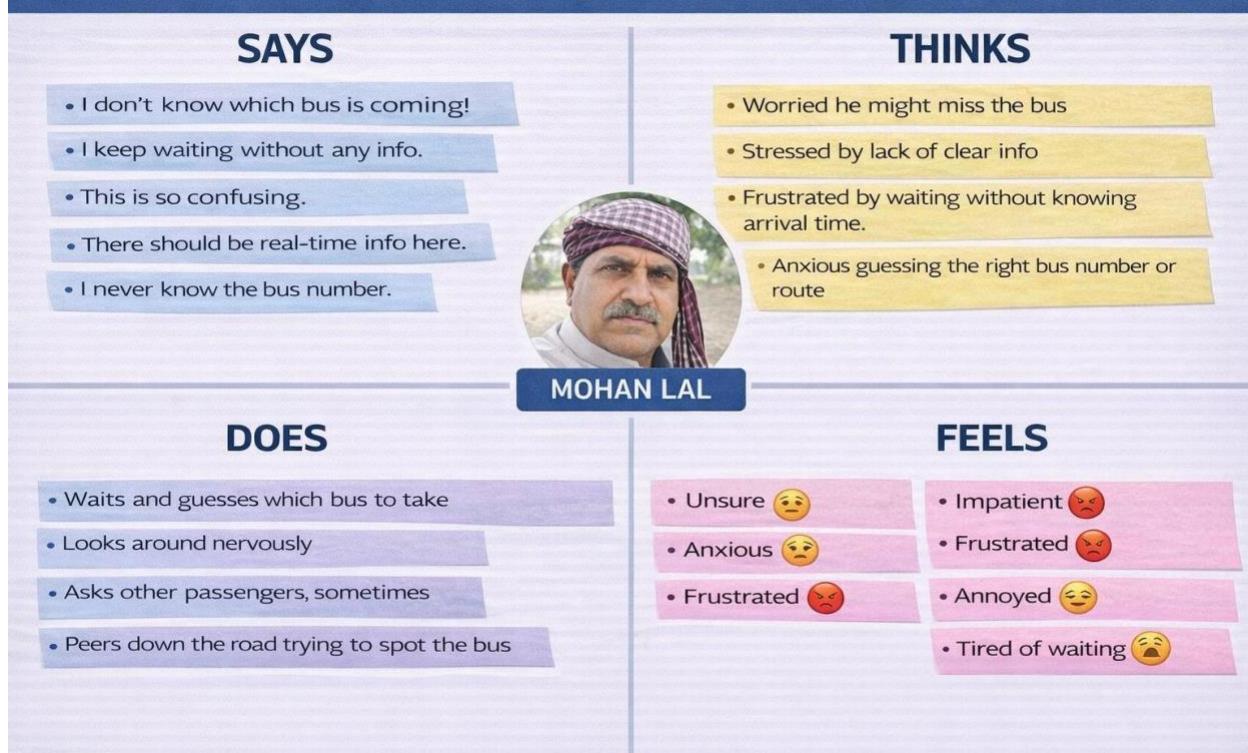
## Empathy Map for Harshith



### Persona 2: Mohan Lal

- Age: 52
- Usage: Daily
- Problem: No bus number / route info
- Motivation: Certainty and comfort

## Empathy Map for Mohan Lal



### STEP 9: Translate Insights to System Needs

Insight	Software Requirement
Uncertainty causes stress	Real-time digital board
Guessing buses	Clear bus number display
Elderly confusion	Simple text & layout
Missed buses	Live arrival timing

### STEP 10: Solution Definition

**Final Solution:**

☞ **Digital Boards Showing Real-Time Bus Timings**

The digital board displays:

- Bus number
- Destination
- Live arrival time

## **STEP 11: Reflection**

### **1. What surprised you?**

Even short waits become stressful without information.

### **2. Which assumption was wrong?**

That elderly users avoid buses — they rely on them daily.

### **3. How did empathy change your thinking?**

It shifted focus from speed to clarity.

### **4. How will this affect your design approach?**

I will design for predictability and accessibility first.

## **Design Thinking Phase Mapping**

<b>Phase</b>	<b>Activity</b>
Empathize	Survey, Empathy Map
Define	Insights, Personas
Ideate	Digital Board
Prototype	Information Display
Test	Next Lab