**Online Activity No. 8 and 9: Applying the User-Centred System Design Process**

**Objective**

1. Innovate an existing interactive system and computer technology.
2. Perform and apply UCSD.

**Materials**

* Personal computer
* Any software for (Computer aided designs)or programming language

### Background of the Study

Public transportation is essential for mobility, especially for those without access to private vehicles. However, people with disabilities—such as wheelchair users, visually impaired individuals, and people with cognitive impairments—face numerous challenges. These include lack of real-time accessibility data (e.g., working elevators or ramps), poor interface design in existing apps, and unclear or inaccessible station signage. While systems like Google Maps offer some accessibility features, they often lack local context, updates, or compatibility with assistive devices.

This proposal aims to develop an inclusive transit app interface that supports offline use, integrates real-time updates, and is accessible to users with different types of disabilities. The system will be developed using the User-Centered System Design (UCSD) process, with research rooted in real-world observation and user interviews.

### Statement of the Problem

* There is a lack of real-time accessibility updates in public transport apps.
* Signage and navigation tools are often not compatible with screen readers.
* The existing systems use inconsistent symbols or unclear interfaces.
* Riders with disabilities often depend on informal networks due to limited accessible features.

### Assumption of the Study

The proposed app interface will:

* Provide real-time updates on elevator/ramp availability and station disruptions.
* Be fully compatible with screen readers and support multimodal feedback (visual, auditory, haptic).
* Allow offline functionality for when internet access is weak.
* Enable users to contribute accessibility information through crowdsourced updates.

### Significance of the Study

| **Rank** | **Beneficiary** | **Justification** |
| --- | --- | --- |
| 1 | People with Disabilities | Enhanced independence and confidence in navigating public transportation. |
| 2 | Transit Agencies | Reduce complaints and improve service for a wider demographic |
| 3 | Developers and Designers | Provide a model for inclusive design in future transportation apps. |
| 4 | Advocacy Groups | Better tools for educating and lobbying for infrastructure improvements. |
| 5 | General Public | A more inclusive transit system benefits all through better signage and information |

## CHAPTER II. RESEARCH DESIGN

### User-Centered System Design (UCSD) Stages

### 1. Task Analysis

#### User Characteristics

* Wheelchair users
* Visually impaired users
* Individuals with cognitive impairments  
  *Research justification: user interviews and on-site observation at transit stations.*

#### Task Characteristics

* Plan a trip using accessible transit stations
* Board and exit buses/trains safely
* Handle route disruptions (e.g., broken elevators)

#### Task Environment

* **Physical**: crowded stations, poor lighting, noisy surroundings
* **Technological**: digital signage, app interfaces, voice systems

#### Design Implication

* The interface must work offline.
* It must support multimodal input/output (text, audio, haptic).

#### Structured Task Flow

### 3. Storyboarding and Prototyping

#### Storyboard Summary

* User opens the app
* Inputs origin and destination
* Activates "Accessible Route"
* Receives real-time alerts (e.g., elevator outage)
* Gets voice-guided directions with vibrational feedback
* Submits feedback on arrival

Evaluation Criteria (Based on the 10 heuristics of design evaluation)

| **Area of Evaluation** | **5** | **4** | **3** | **2** | **1** |
| --- | --- | --- | --- | --- | --- |
| 1. **Visibility of System Status**  * - The system design provides appropriate feedback like message prompts in response to user actions. * The message prompts are clear, visible and understandable. | ✔️ |  |  |  |  |
| ✔️ |  |  |  |  |
| 1. **Match between the system and the real world**   - Used words, phrases and concepts according to users’ language rather than system oriented words and computer jargons. | ✔️ |  |  |  |  |
| 1. **User control and freedom**   - The system design provides ways of allowing users to easily “get in” and “get out” if they find themselves in unfamiliar parts of the system. | ✔️ |  |  |  |  |
| 1. **Consistency and Standards**  * - The colors, text, labels, buttons and other elements in the design are uniform from start to finish**.**   - Text and icons are not too small or too big.  **-** Menus and other features of the system are arranged and positioned in a consistent way. (For ex. If your website has navigation buttons on the top under the page title on one page, the users will automatically look there for the same features on other pages. | ✔️ |  |  |  |  |
| ✔️ |  |  |  |  |
| ✔️ |  |  |  |  |
| 1. **Error Prevention**   - The system design provides an automatic detection of errors and preventing them to occur in the first place.  - Idiot proofing mechanisms are applied | ✔️ |  |  |  |  |
| ✔️ |  |  |  |  |
| **F. Help users recognize, diagnose and recover from errors**  **-** Error messages and the terms used are recognizable, familiar and understandable for the users. | ✔️ |  |  |  |  |
| **G. Recognition rather than recall**  **-** Objects, icons, actions and options are visible for the user.  - Objects are labeled well with text and icons that can immediately be spotted by the user and matched with what they want to do. | ✔️ |  |  |  |  |
| **H. Flexibility and efficiency of use**  - The system design provides easy to navigate menus.  - the system does not make wasteful time of system resources. | ✔️ |  |  |  |  |
| 1. **Aesthetic and minimalist design**   **-**Graphics and animations used are not difficult to look at and does not clutter (mess) up the screen.  - Information provided is relevant and needed for the system design. | ✔️ |  |  |  |  |
| 1. **Help and Documentation**   **-**the system design provides information that can be easily searched and provides help in a set of concrete steps that can easily be followed. | ✔️ |  |  |  |  |

## CHAPTER III. CONCLUSION AND RECOMMENDATION

### Conclusion

Through the application of the User-Centered System Design process, this project has identified critical gaps in current public transport systems for people with disabilities. The proposed accessible transit app aims to resolve issues of real-time data, poor UI, and limited accessibility. Direct user involvement ensured that the system prioritizes inclusivity, simplicity, and independence.

### Recommendation

* Expand the app to include speech-to-text for cognitive and hearing-impaired users.
* Partner with transit authorities to improve data reliability and elevator status feeds.
* Offer user training or onboarding for first-time users with visual or cognitive impairments.

This project highlights the importance of designing with empathy, real-world context, and inclusive technology practices.