TATAKAE

ShunoBondhu: A Voice-Assisted Mobile App for Paddle Rickshaw Pullers in Bangladesh

Team Members: Nusrat Jahan Bably (011201435), Md. Al - Emran (011221088), Mohin Khan (011221091), Ananna Saha (011221117), Kona Moni (011221500), Md. Ammar Hossain (011221601)

Pain Point

Rickshaw pullers in Bangladesh face multiple challenges while navigating unfamiliar routes, managing earnings, and ensuring personal safety. Despite being smartphone users (at least partially), they struggle with digital literacy, technology usability, and lack of tailored digital tools. These issues make it harder for them to navigate unfamiliar routes, monitor their safety, and track income effectively. To address these gaps, we propose a voice-first mobile application designed specifically for rickshaw pullers, enabling them to:

      (a) access quick emergency support,
      (b) navigate routes safely,
      (c) keep track of earnings and
      (d) speed monitoring when driving.

From our formative research, we identified four major key pain points:

1. Earnings Tracking: Casual system; desire easy summaries.
2. Navigation: Peers and landmarks over maps.
3. Safety: Highly vulnerable to theft/accidents; desire quick emergency alert.
4. Speed Awareness: Lack of speed control, leading to accidents.

Tasks supported by the prototype: Every task is outlined as an action in the real world and how a successful outcome would appear. The details of the tasks are given below:

Task 1 - Log trip earnings and show daily summary by voice:

Real-world action: After a trip, the puller records the fare: "৫০ টাকা জমা হয়েছে". In response, the app adds the trip amount to the day's total and the app vocalizes the updated total.

Key subtasks supported in prototype:

- For each trip, the puller gives a quick voice input(amount + area + destination + time). The app then suggests the exact fare for that route based on distance and time.

- Trips are grouped automatically by day, and the home screen shows today's total earnings.
- At day's end, the app gives a voice summary of earnings, e.g., 'আজ আপনার মোট আয় ৯৫০ টাকা । Additionally, after every ১০০০ টাকা milestone, the app congratulates the puller with a special voice message.

Task 2 - Find & follow a safe, landmark-based route to a destination:

Real-world action: The puller wants to go to Badda bus stand near the big mosque (বাড্ডা বাইতুল আমান জামে মসজিদ). In response, the app provides vocal directions by landmarks, the user follows, and the app confirms arrival at the destination.

Key subtasks supported in prototype:
- The puller speaks the destination in Bangla, and the app recognizes it for navigation.
- The system suggests the safest path by landmarks; voice provides step-by-step directions.
- Rickshaw pullers can say 'repeat' or 'slow down' for voice guidance, or tap large 'Next' and 'Back' buttons for consistent app navigation.
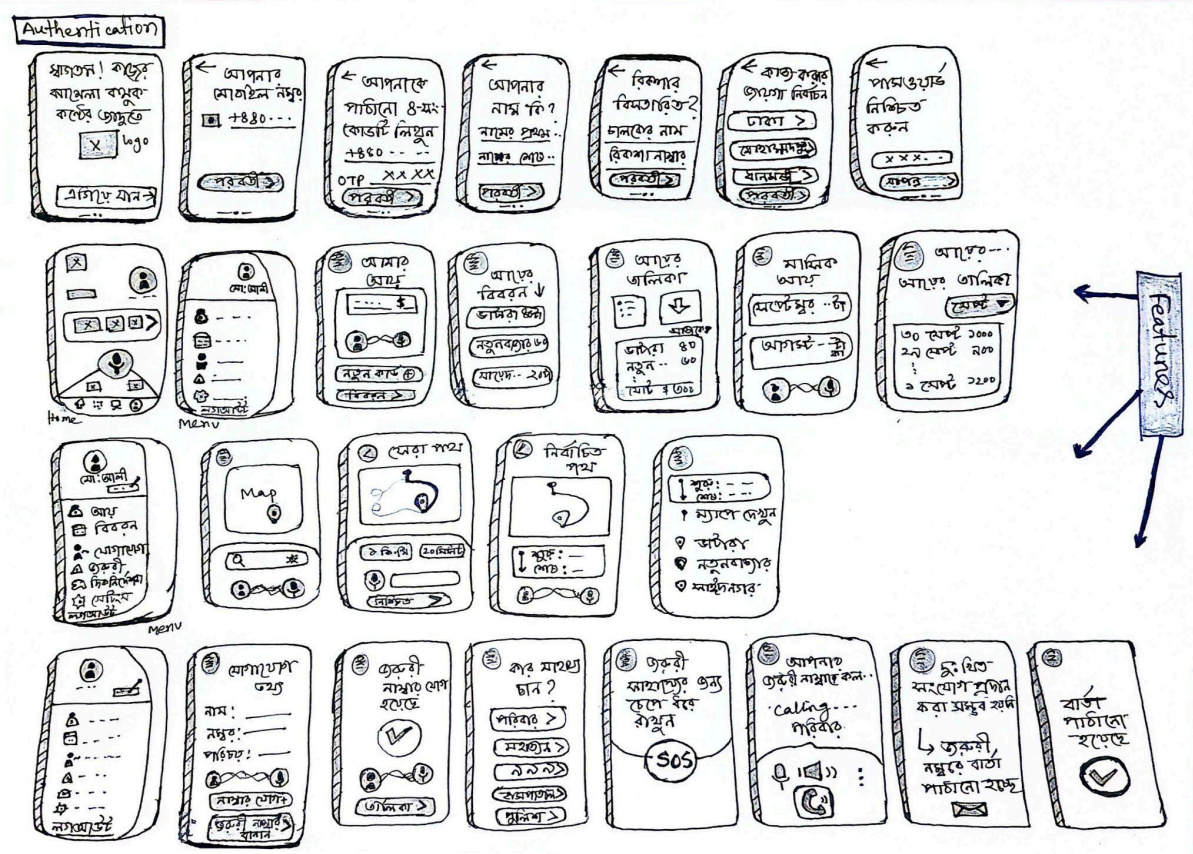
Task 3 - Trigger SOS & notify selected contacts:

Real-world action: The puller shouts or presses and holds the red SOS button. In response, The app sends an SMS/automatic voice call (and small pre-recorded location message) to selected contacts and plays an alarm to attract attention.

Key subtasks supported in prototype:
- The user can send an emergency alert by holding the big red SOS button or saying 'সাহায্য' / 'SOS'.
- The app automatically fetches last-known location (GPS if available, otherwise landmark-based fallback) and sends an SMS with a short Bangla message and link.
- Optionally call the first contact if SMS fails; play loud alarm through phone speaker.

Paper Prototype Sketches (low-fidelity): Below are simplified sketches that capture the primary screens and interactions used in early prototyping. Each sketch includes a short interaction description:

Initial sketches:

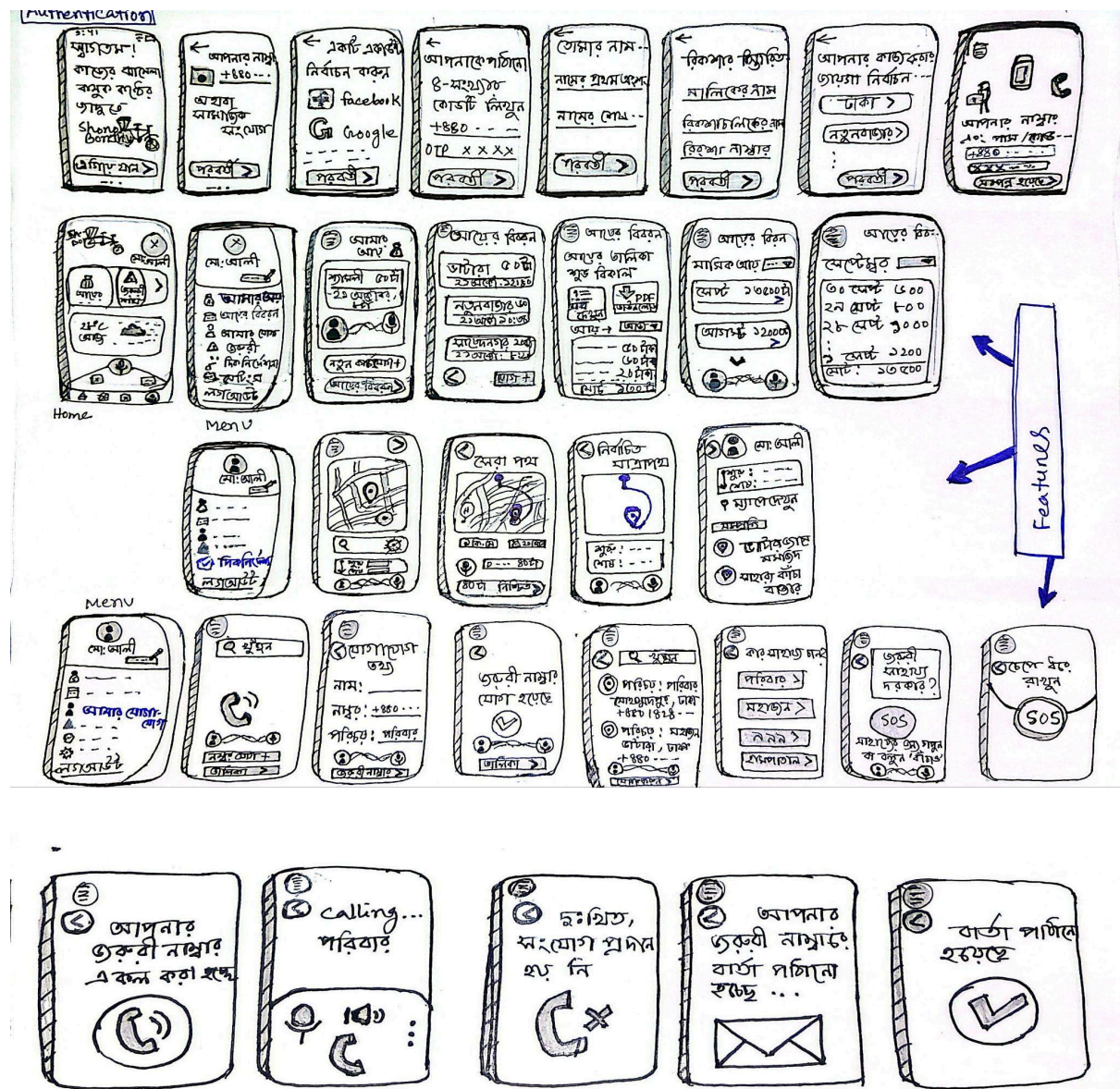## How A Person Interact with the Features:

The description of how a rickshaw puller might actually interact with these features in a voice-first mobile app is given below:

1. Earnings Tracking: After each trip, the puller can say the fare amount or tap large number buttons. The app adds it to a daily total and gives simple summaries like *"আজ আপনার মোট আয় ৯৫০ টাকা"* This helps track income easily.

2. Safe Route Navigation: Instead of complex maps, the app provides voice instructions (e.g., *"মসজিদের কাছে বাঁ দিকে ঘুরুন"*) and large directional arrows. If off-route, it quickly corrects the path, helping pullers travel safely and confidently.

3. Emergency Support Access: With a single tap like *"জরুরি সাহায্য"*, the app alerts a chosen contact and shares the rickshaw puller's live location. A vibration confirms the alert, ensuring quick and reliable emergency support.

Insights from Peer Evaluation: The feedback from our peers was valuable in identifying areas where our prototype could be made more user-friendly and interactive. They emphasized the need for smoother user interaction and clearer
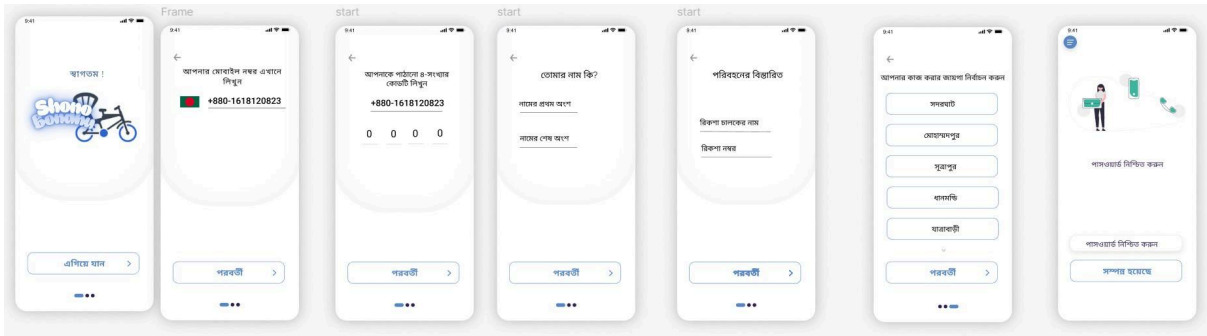
navigation flows. Based on their suggestions, we introduced several improvements, including the addition of a setup button, the restructuring of page navigation, and the inclusion of back and next buttons to ensure smooth and intuitive movement between screens. These changes made the overall design more aligned with the needs of end users and enhanced usability.
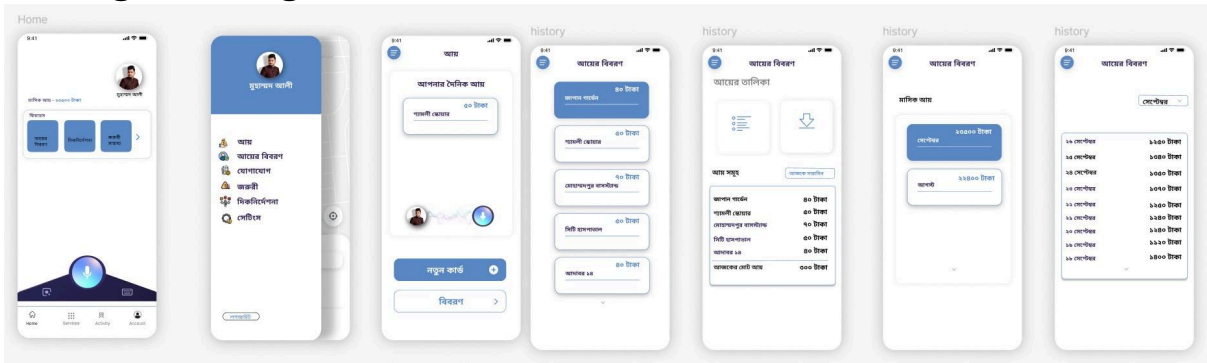
After Peer Evaluation the new sketches are given below:

Higher-fidelity prototype (Figma Design): We translated the paper flows into wireframes using Figma. Key design of the features are given below:

Initial Figma Prototype: Initially a user needs to register to the mobile application. The scenario of the registration process is given below:
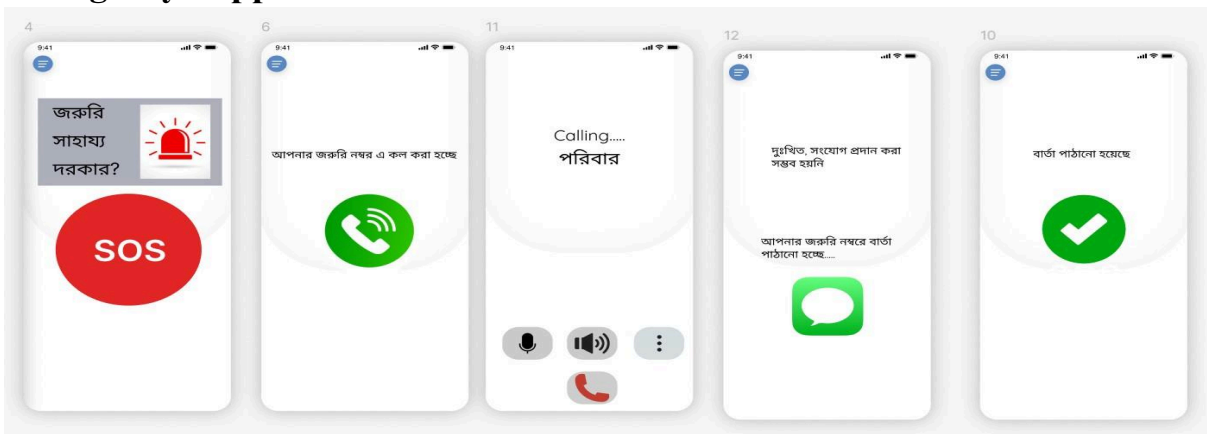
Earnings Tracking Feature:

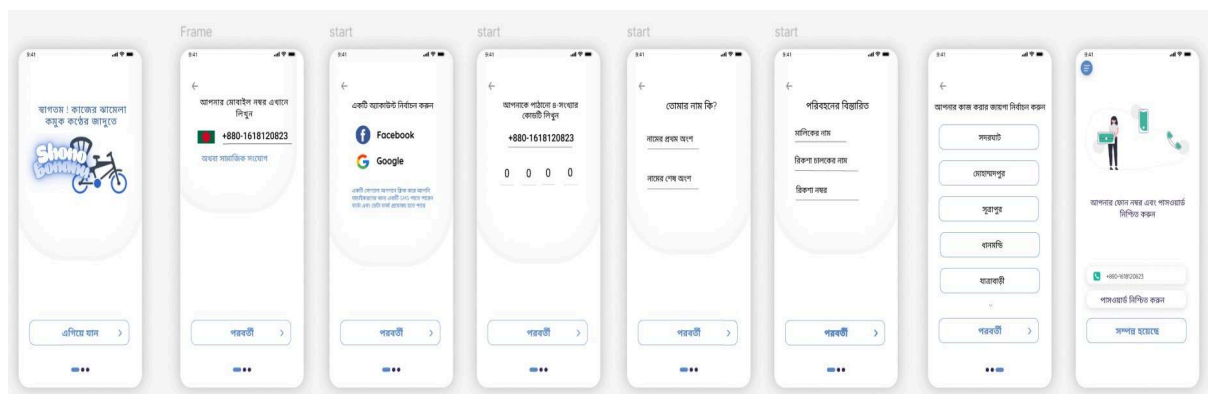## Route Navigation Feature:

Emergency Support Feature:

Changes Made in Response to Peer Evaluation: Following the peer evaluation, we received constructive feedback on how to make our prototype more interactive and user-friendly. Our peers suggested that the design needed clearer navigation and more intuitive controls to support the needs of end users.
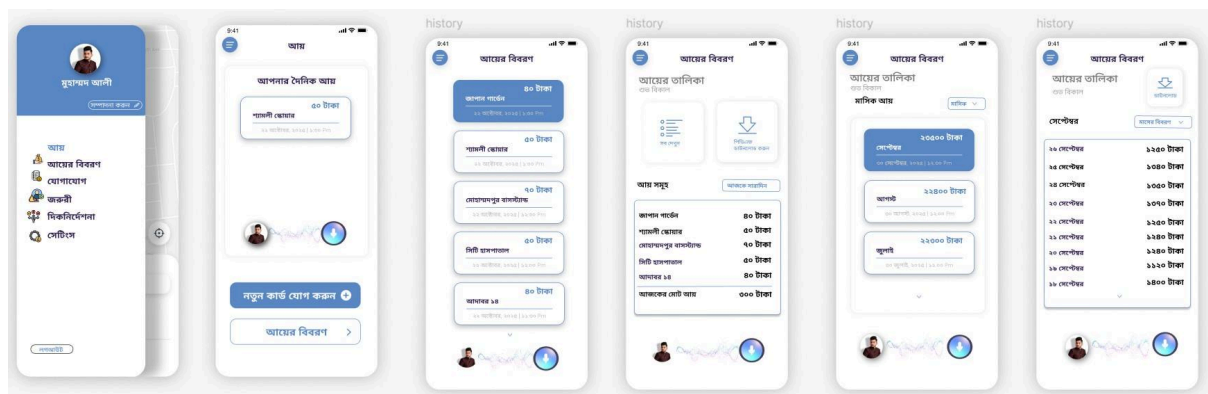
In response, we made several significant improvements. We added a setup button to allow users to easily configure the app according to their preferences. The page navigation was restructured to make movement between screens more logical and straightforward, while a root navigation system was implemented to give users quick access to the main features from any screen. Additionally, we introduced back and next buttons, enabling smooth and predictable forward and backward navigation.

These changes collectively enhanced the user interaction, making the app more accessible and easier to use. The new higher-fidelity prototypes, reflecting these updates, are presented below:
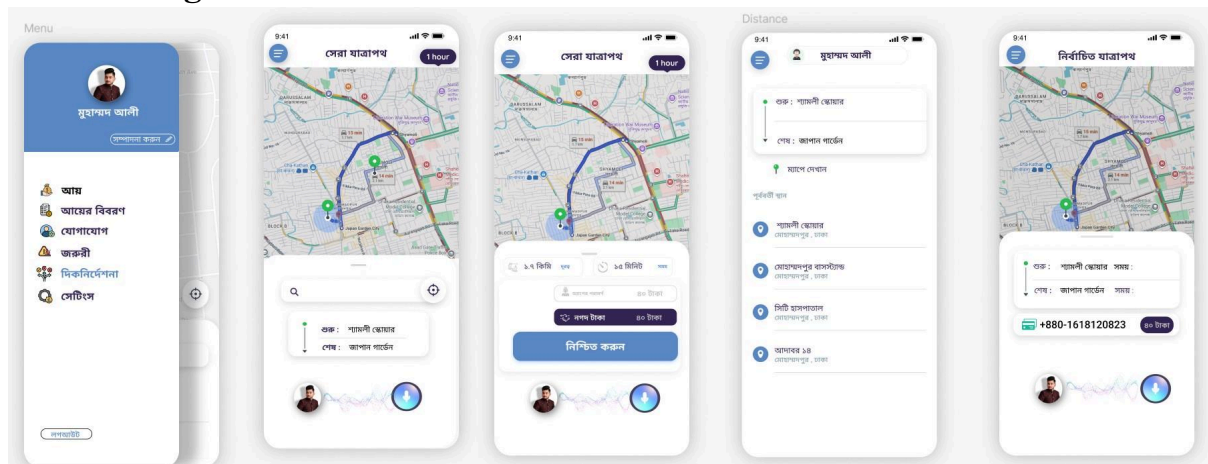
After Peer Evaluation: The updated home page is given below:

The Earnings Tracking Feature:

Route Navigation Feature:

Emergency Support Feature:

Team Contribution: Our project tasks were distributed among team members to leverage individual strengths and ensure efficient progress. The contribution of each member is given below:

Paper Prototype Design: Nusrat Jahan Bably was responsible for creating and refining the paper prototypes. Kona and Ananna conducted the peer evaluation of the paper prototypes.

Figma Prototype Design: Ananna Saha and Kona Moni developed the higher-fidelity prototypes using Figma. Ammar and Imran conducted the peer evaluation of the paper prototypes.

Report Development: Md. Al - Emran and Md. Ammar Hossain worked on writing and organizing the project report, which was later rechecked by Nusrat and Mohin.

Presentation Slides: Mohin prepared the presentation slides for showcasing the project, while all team members reviewed and incorporated necessary updates to ensure their accuracy and completeness.

Appendix:

Before & After Evaluation: 🖼 Paper_Prototype

Before Evaluation: ⎆ Figma   After Evaluation: ⎆ Figma