
QR code-based Restaurant food ordering

Webapp - SnapMenu

The domain of the Project:

User research, User Experience & User Interface Design

Under the guidance of:

Mr. Sen Girri Sudhan (UX & UI Designer)

Team Member:

Mr. Sujal Bendre, BSc (IT), 2nd year pursuing

Period of the project

4 Months

April 2024 to December 2024

Declaration

The project titled "**QR code-based Restaurant Food ordering Webapp - SnapMenu**" has been mentored by **Mr. Sen Girri Sudhan**, organised by SURE Trust, from April 2023 to August 2023, for the benefit of the educated unemployed rural youth for gaining hands-on experience in working on industry relevant projects that would take them closer to the prospective employer. I declare that to the best of my knowledge the members of the team mentioned below, have worked on it successfully and enhanced their practical knowledge in the domain.

Team Members:

Signature



Mr. Sujal Bendre

Mentor's Name:

Signature

Mr. Sen Girri Sudhan — MetricStream

Seal & Signature

Prof. Radhakumari
Executive Director & Founder
SURE Trust

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Executive Summary

Objectives

- **Streamline restaurant ordering with QR codes** – Allow customers to scan a QR code at their table to access the digital menu and place orders without waiting for a waiter.
- **Reduce wait times and enhance customer experience** – Eliminate the need for physical menus and manual order-taking, making the ordering process more efficient.
- **Provide a user-friendly digital menu for restaurants** – Enable restaurant owners to update menu items, prices, and availability in real time.
- **Improve operational efficiency** – Minimize miscommunication between staff and customers, reducing errors in order processing.

Methods

- **User Research**
 - Conducted interviews and surveys with **restaurant owners, waitstaff, and customers** to understand their pain points and expectations.
 - Identified common frustrations such as **long wait times, unresponsive staff, and outdated paper menus.**
- **Competitive Analysis**
 - Studied existing **food ordering apps and QR-based restaurant solutions** to identify industry best practices.
 - Noted that most apps focused on either dine-in or delivery, with few effectively combining both.
- **Wireframing & Prototyping**
 - Designed **low-fidelity wireframes** to define user flows and interface structure.
 - Created **high-fidelity prototypes in Figma**, implementing a **bento grid layout** for the digital menu to improve readability and accessibility.
- **Usability Testing**
 - Tested the prototype with **real users in a restaurant setting** to observe behavior and gather feedback.
 - Identified friction points such as **mandatory login causing drop-offs** and refined the design to introduce **session-based login** for better user retention.

Introduction

Background & Context

- The traditional restaurant ordering system relies on **physical menus and waitstaff**, leading to **delays, miscommunication, and inefficiencies** in customer service.
- Many restaurants, especially post-pandemic, have **shifted towards digital menus and contactless solutions**, but existing apps are often complex, require mandatory logins, or are not tailored for dine-in experiences.
- **SnapMenu** was conceptualized to provide a **seamless, QR code-based ordering experience** that allows customers to scan, browse, order, and pay directly from their smartphones, reducing dependency on staff and improving service speed.

Problem Statement / Goals

- **Problem:**
 - Customers experience **long wait times** to place orders and get service, especially during peak hours.
 - Physical menus are often outdated, unhygienic, and difficult to manage for restaurants.
 - Many digital ordering solutions require **app downloads or mandatory login**, causing friction in user adoption.
 - Restaurants struggle with **manual order management**, leading to errors and inefficiencies.
- **Goals:**
 - Provide a **fast, contactless** food ordering experience using QR codes.
 - **Reduce customer frustration** by minimizing wait times and simplifying the ordering process.
 - Enable restaurant owners to **update menus in real time** without printing new physical copies.
 - Create a **simple, user-friendly backend system** for restaurant staff to manage orders efficiently.
 - Offer a **guest checkout or session-based login** to remove unnecessary friction in the ordering process.

Scope & Limitations

- **Scope:**
 - Focuses on **dine-in customers** ordering through a QR code-based web app.
 - Enables **real-time menu updates, order tracking, and direct payments** from mobile devices.
 - Designed for **small to medium-sized restaurants** that want to digitize their ordering system without complex integrations.
- **Limitations:**

- **Does not include delivery services** – The platform is built specifically for in-restaurant dining.
- **Limited to restaurant-managed menus** – Customers cannot modify items beyond the customization options provided.
- **Internet dependency** – Requires a stable internet connection for smooth operation.

Innovation Component

- **Seamless QR-Based Ordering:** Eliminates the need for downloading an app, providing instant menu access with a quick scan.
- **Bento Grid Menu Layout:** Enhances visual appeal and usability, making menu navigation faster and more engaging.
- **Session-Based Login:** Allows customers to place orders without the hassle of creating an account, reducing drop-offs.
- **Real-Time Menu Updates:** Restaurants can dynamically adjust availability, pricing, and promotions without needing printed menus.
- **Integrated Order Management System:** Provides restaurant staff with an intuitive backend for tracking orders and managing customer requests efficiently.
- **Future AI Integration Possibilities:** Potential to implement AI-powered dish recommendations based on customer preferences.

Project Objectives

Objectives & Goals

1. **Enhance the Dining Experience**
 - Provide a **faster and seamless food ordering process** using QR codes.
 - Eliminate the need for physical menus and minimize waiter dependency.
2. **Increase Operational Efficiency for Restaurants**
 - Enable restaurants to **update menus in real time** without reprinting physical copies.
 - Reduce order errors and miscommunication by automating the order-taking process.
3. **Improve User Accessibility & Engagement**
 - Ensure a **frictionless ordering experience** with an intuitive UI.
 - Introduce **guest checkout and session-based login** to reduce barriers to entry.
4. **Optimize Order Management & Restaurant Analytics**
 - Provide restaurant staff with a **simple dashboard** to track orders, update availability, and view sales insights.
 - Implement **real-time order tracking** for both customers and staff.
5. **Support Contactless & Digital Payment Methods**
 - Integrate **multiple payment options** (UPI, card, digital wallets) for a **cashless, hassle-free checkout experience**.

Expected Outcomes

- A **fully functional high-fidelity prototype** of the SnapMenu QR-based food ordering web app.
- A **streamlined ordering experience** for customers, reducing wait times and enhancing convenience.
- A **user-friendly dashboard for restaurant owners** to manage menus and track orders efficiently.
- A **mobile-responsive, intuitive UI** with an accessible and visually engaging menu layout.
- Reduced dependency on waitstaff, leading to **faster service and increased restaurant efficiency**.

Deliverables

User Research Report – Findings from customer and restaurant owner interviews.

User Personas & User Journeys – Representing key user groups and their interactions.

Competitive Analysis – Insights from existing food ordering solutions.

Wireframes & High-Fidelity UI Designs – Designed using **Figma**, showcasing user flows and interactions.

Interactive Prototype – Clickable Figma prototype demonstrating end-to-end ordering.

Usability Testing Report – Feedback and design iterations based on real user testing.

Methodology and Results

Methods & Technology Used

Design Thinking Process – Followed a user-centered design approach including **empathizing, defining, ideating, prototyping, and testing**.

User Research & Analysis – Conducted interviews and surveys to understand pain points and needs.

Wireframing & Prototyping – Created low-fidelity and high-fidelity designs to visualize the solution.

Usability Testing & Iteration – Collected user feedback and refined the design accordingly.

Frontend Development (Future Scope) – Planning to use **React.js** for the web app's interface.

Backend Development (Future Scope) – Considering **Node.js** and **Firebase** for real-time order processing and database management.

Tools & Software Used

Figma – Wireframing, UI design, and prototyping.

FigJam – Brainstorming, user flow mapping, and ideation.

Miro – Visualizing research insights and competitor analysis.

Google Forms & Sheets – User surveys and data analysis.

Adobe Illustrator – Logo and branding assets.

Data Collection Approach

Primary Research (User Research & Interviews)

Conducted interviews with **restaurant owners, staff, and dine-in customers** to understand their needs.

Gathered feedback on existing **food ordering pain points** and user expectations from a digital system.

Secondary Research (Competitive Analysis & Market Study)

Analyzed existing QR-based ordering apps to identify strengths, weaknesses, and **opportunities for innovation**.

Studied **restaurant industry trends** to understand the growing need for **contactless dining solutions**.

Usability Testing

Created an interactive prototype and tested it with **potential users** to gather feedback on **navigation, ease of ordering, and UI design**.

Observed user behavior and iterated based on insights.

Project Architecture (Conceptual Flow)

1. User Interaction Layer (Frontend – QR Code & UI)

Customers **scan a QR code** placed on the restaurant table.

They are redirected to the **SnapMenu web app** (no download required).

The app displays a **dynamic digital menu** with categories, images, and customization options.

Users **add items to the cart** and place their order.

2. Order Processing Layer (Backend – Admin Dashboard & Order Management)

Order details are **sent to the restaurant's dashboard** for processing.

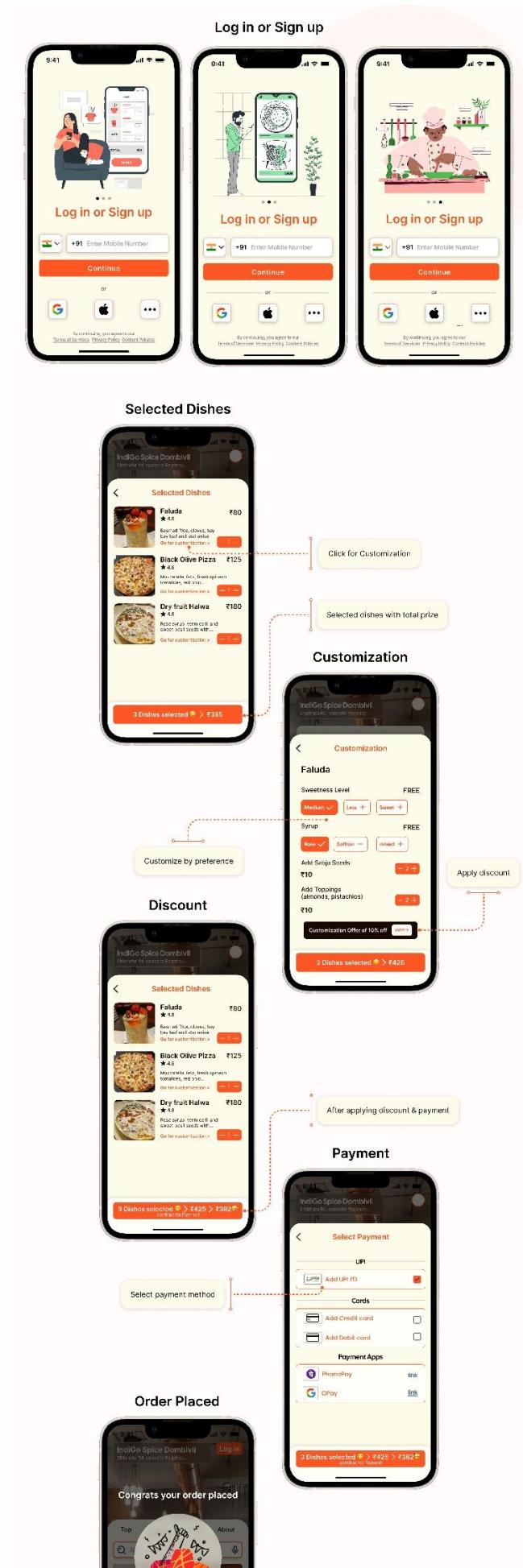
The **restaurant staff receives real-time notifications** on new orders.

Orders are **marked as 'In Progress' or 'Ready'**, updating the customer in real time.

3. Payment & Authentication Layer (Future Scope)

Integration with **UPI, credit/debit cards, and digital wallets** for a seamless checkout process.





Learning and Reflection

New Learnings from the SnapMenu Project

UX/UI Design & Technology

1. **Improved Information Architecture** – Learned how to structure **menu layouts effectively** for quick navigation.
- Better Mobile UI/UX Design** – Understood how to **design for responsiveness**, ensuring a smooth experience across different screen sizes.
- Session-Based Login Concept** – Explored how **guest checkout** can improve user experience by eliminating unnecessary barriers.
- QR Code Integration Research** – Learned about the **technical aspects** of generating and implementing QR codes for web-based applications.
2. **User Research & Testing**
 - Conducting Effective User Interviews** – Improved my ability to **ask the right questions** and extract meaningful insights from users.
 - Usability Testing & Feedback Analysis** – Understood how to **observe user behavior** and iterate based on real-world interactions.
 - Competitive Analysis** – Learned how to **evaluate existing solutions** and find **opportunities for innovation**.
3. **Project Management & Collaboration**
 - Task Prioritization & Time Management** – Managed **multiple design tasks effectively** within deadlines.
 - Using Trello for Organization** – Helped me structure my workflow and **track project progress efficiently**.
 - Stakeholder Communication** – Learned how to **present my design decisions effectively** to different audiences (restaurant owners, users, and developers).
4. **Design Thinking & Problem Solving**
 - Defining Clear User Pain Points** – Understood how to **pinpoint key problems** and design around **real needs**.
 - Iterative Design Approach** – Learned the importance of **continuous improvement** based on real-world user testing.
 - Balancing Aesthetics with Functionality** – Focused on making the UI both **visually appealing** and **highly functional**.

Overall Experience with the SnapMenu Project

1. **A Challenging but Rewarding Journey** – Working on **SnapMenu** was an exciting challenge as it required a **balance between user needs, business goals, and technology feasibility**.
2. **Deepened My UX/UI Knowledge** – This project pushed me to **think beyond visuals** and focus on **solving real-world problems through design**.
3. **Gained Hands-on Experience in Research** – I developed a deeper understanding of **how user behavior impacts design** and how to **validate ideas through testing**.
4. **Improved Problem-Solving Skills** – Every design decision had to be backed by **logic, usability, and real-world application**, which strengthened my **critical thinking**.
5. **Enhanced My Collaboration & Communication Skills** – Whether it was **documenting insights, presenting my ideas, or collecting feedback**, I learned how to **effectively communicate with different stakeholders**.
6. **Understanding the Importance of Project Planning** – Managing multiple design aspects simultaneously helped me **improve my workflow efficiency** and **prioritize tasks better**.
7. **Excited for Future Enhancements!** – This project has inspired me to explore more **interactive, AI-driven restaurant solutions** and possibly **develop SnapMenu further with real-world testing and implementation**.

Conclusion and Future Scope

SnapMenu: Recap of Objectives & Achievements

Project Objectives (Recap)

1. **Enhance the Dining Experience** – Provide a seamless, **QR code-based ordering system** for restaurants.
 2. **Increase Operational Efficiency** – Reduce **wait times and miscommunication** by automating order-taking.
 3. **Improve User Accessibility** – Offer an intuitive, **mobile-responsive interface** with easy navigation.
 4. **Optimize Order Management** – Enable restaurants to **track and manage orders efficiently** via a dashboard.
 5. **Support Contactless Payments** – Integrate **multiple payment methods** for a hassle-free checkout experience.
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Achievements

1. **Designed a high-fidelity prototype** showcasing a seamless QR-based ordering flow.
 2. **Conducted extensive user research**, gaining insights from both **restaurant owners and customers**.
 3. **Created intuitive UI/UX designs** for easy order placement and restaurant management.
 4. **Developed a structured restaurant dashboard** to track orders in real time.
 5. **Implemented usability testing** and made improvements based on feedback.
 6. **Ensured an efficient, visually appealing, and user-friendly design** that enhances the overall dining experience.
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Future Scope of SnapMenu

1. **Real-Time Order Updates & Notifications** – Implementing a system for restaurants to update order statuses in real time, notifying customers when their food is ready.
 2. **Integration with Payment Gateways** – Adding **UPI, credit/debit card, and wallet payment options** for a **fully digital** transaction experience.
 3. **AI-Powered Personalized Recommendations** – Using **AI to analyze user behavior** and suggest popular dishes or customized meal options.
 4. **Multi-Restaurant Support** – Expanding SnapMenu's capabilities to allow **multiple restaurants on the same platform**, enabling users to switch between different menus easily.
 5. **Data Analytics for Restaurants** – Providing insights on **customer preferences, best-selling items, and peak ordering hours** to help restaurant owners make data-driven decisions.
 6. **Voice-Based & Gesture Ordering (Future Tech Integration)** – Exploring innovative features like **voice-assisted ordering** for a hands-free experience.
 7. **Integration with Delivery Services** – Expanding the platform to **support food delivery**, allowing restaurants to handle both dine-in and takeaway orders.
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Final Thought

The SnapMenu project has laid a **strong foundation for digital restaurant ordering**, and with further development, it has the potential to **become an industry-leading solution** for restaurant owners and diners alike.

[Behance Portfolio](#)